

PRESS RELEASE

Tuesday 7 November, 2017

BIG DATA ANALYSIS PREDICTS RISK OF RADIOTHERAPY SIDE EFFECTS

Analysing big data to predict men's risk of side effects could help personalise radiotherapy treatment for prostate cancer, according to new research* presented at the National Cancer Research Institute's (NCRI) Cancer Conference in Liverpool, today (Tuesday).

Researchers at The Institute of Cancer Research, London, have, for the first time, applied big data analytics to information from more than 700 men given radiotherapy to treat their prostate cancer**. This included medical history, genetics, radiotherapy dose, and reported side effects.

Advances in technology allow huge amounts of different information to be combined and analysed at once. This technique is already used in many different settings, including to improve the accuracy of weather forecasts, make investments and trading decisions, and even monitor premature babies.

Researchers in this study*** used state-of-the-art artificial intelligence to highlight which information might predict sensitivity to the side effects of prostate radiotherapy. In particular, specific genetic characteristics – SNPs (single nucleotide polymorphisms) – were predictive of a patient suffering rectal bleeding.

At the moment there is no way to adjust doses of radiotherapy according to how sensitive a patient might be to the side effects. This means that while some men are receiving too much and suffering side effects, some are given too little and this compromises the chances of successful treatment.

Side effects include bowel, urinary and sexual dysfunction and can be difficult for patients to tolerate and can persist after treatment.

The researchers suggest that with further validation, this information could be used to create personalised treatment plans for prostate cancer patients. The technique could also be applied to many other types of cancer that are treated with radiotherapy.

Dr Navita Somaiah, co-lead researcher at The Institute of Cancer Research, London, said: "Advances in technology have enabled us to combine what we've learnt from decades of research into radiotherapy. For the first time, we can now look at the full complexity of a patient's genetics, medical history and treatment, to predict if they are at risk of side effects.

"We hope that our method can be used to personalise radiotherapy for patients based on this risk, improving the chances of a cure and also minimising the side effects suffered.

"This has been a huge collaborative effort between clinicians, physicists, biologists, statisticians and data scientists."

Dr Di Gilson, member of the NCRI's Scientific Committee for the Conference, said: "Radiotherapy is a cornerstone of successful cancer treatment for thousands of

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patients. Unfortunately some patients who have radiotherapy will suffer long term side effects and for a minority these can be irreversible, progressive and debilitating.

“With more patients surviving their cancer than ever, it’s absolutely essential to find treatments that are both effective and minimise side effects, so that more patients can also enjoy a better quality of life.”

ENDS

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Notes to editors

*NCRI Abstract: Big-RT: Big Data analysis to identify combinatorial predictors of radiotherapy toxicity for personalised treatment in prostate cancer patients.

<http://abstracts.ncri.org.uk/abstract/big-rt-big-data-analysis-to-identify-combinatorial-predictors-of-radiotherapy-toxicity-for-personalised-treatment-in-prostate-cancer-patients/>

**Researchers performed a fully integrative analysis of data collected during the Cancer Research UK funded CHHiP trial (Conventional or hypofractionated high dose intensity modulated radiotherapy for prostate cancer). This includes clinician- and patient-reported outcomes, co-morbidities, dose delivery and genetic data. The methodology was applied to 721 patients (out of 3,212 recruited) with complete data profiles.

***The researchers are supported by the CRUK Centre at The Institute of Cancer Research, London, and The Royal Marsden NHS Foundation Trust, the CRUK CTU programme grant, The Heather Beckwith Charitable Settlement, The John L Beckwith Charitable Trust and the ICR Team Science award. The RAPPER/PRACTICAL consortia provided access to genotyping data.

About the NCRI

The National Cancer Research Institute (NCRI) is a UK-wide partnership of cancer research funders, established in 2001. Its 19 member organisations work together to accelerate progress in cancer-related research through collaboration, to improve health and quality of life.

NCRI works to coordinate research related to cancer, to improve the quality and relevance of the research and to accelerate translation of the research into clinical practice for the benefit of patients.

NCRI Partners are: Biotechnology and Biological Sciences Research Council; Bloodwise; Breast Cancer Now; Cancer Research UK; Children with Cancer UK, Department of Health; Economic and Social Research Council (ESRC); Macmillan Cancer Support; Marie Curie; Medical Research Council (MRC); Northern Ireland Health and Social Care Public Health Agency (Research & Development Department); Pancreatic Cancer Research Fund; Prostate Cancer UK; Roy Castle Lung Cancer Foundation; Scottish Government Health Directorates (Chief Scientist Office); Tenovus Cancer Care; The Wellcome Trust; Welsh Assembly Government (Health and Care Research Wales); and Worldwide Cancer Research.

For more information visit www.ncri.org.uk

The Institute of Cancer Research, London, is one of the world's most influential cancer research organisations.

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Scientists and clinicians at The Institute of Cancer Research (ICR) are working every day to make a real impact on cancer patients' lives. Through its unique partnership with The Royal Marsden NHS Foundation Trust and 'bench-to-bedside' approach, the ICR is able to create and deliver results in a way that other institutions cannot. Together the two organisations are rated in the top four centres for cancer research and treatment globally.

The ICR has an outstanding record of achievement dating back more than 100 years. It provided the first convincing evidence that DNA damage is the basic cause of cancer, laying the foundation for the now universally accepted idea that cancer is a genetic disease. Today it is a world leader at identifying cancer-related genes and discovering new targeted drugs for personalised cancer treatment.

A college of the University of London, the ICR is the UK's top-ranked academic institution for research quality, and provides postgraduate higher education of international distinction. It has charitable status and relies on support from partner organisations, charities and the general public.

The ICR's mission is to make the discoveries that defeat cancer. For more information visit <http://www.icr.ac.uk>

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