

# Markers that cause toxic radiotherapy side-effects in prostate cancer identified

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University of Manchester cancer researcher. Credit: Manchester University

A new study involving researchers from The University of Manchester looked at the genetic information of more than 1,500 prostate cancer patients and identified two variants linked to increased risk of

radiotherapy side-effects.

Nearly 50% of the 1.1 million men a year worldwide diagnosed with prostate cancer undergo [radiotherapy](#). It is an effective treatment, but between 10 and 50 percent of men suffer from radiotherapy side-effects which can cause long-term problems with urinating or rectal bleeding.

It is not known why some men are more susceptible to side-effects and as a result doses are kept low to minimise the risk in all [patients](#) – reducing the effectiveness of treatment. The new Radiogenomics Consortium study coordinated from Manchester aimed to identify if there were any genetic markers which could explain this.

Genetic profiling was carried out on 1,564 patients from four centres based in Europe and North America. It examined genetic variants described as single nucleotide polymorphisms (SNPs) which form part of the subunits of DNA.

Two years after the radiotherapy, 17.8% of the group had suffered from rectal bleeding, 15% an increase in urinary frequency and 8.1% a decrease in urine stream.

Professor of Radiation Biology, Catharine West from The University of Manchester's Institute of Cancer Sciences led the research. She said: "The first studies into SNPs were smaller. We needed to show we could combine them to increase the number of patients investigated and improve our ability to identify genetic variants. Centres give radiotherapy in different ways and we needed to show this variability was not a problem."

The two variants found were associated with an increased frequency of urinating and a decreased flow of urine.

The causes for the associations are unclear, but the two SNPs identified are located in the regions of genes that are expressed in tissues exposed to radiation.

The results show radiotherapy cohorts can be combined and larger studies should identify enough variants to develop a test to predict a cancer patient's risk of radiotherapy side-effects.

Professor West added: "There are currently more than 32 million people alive five years after having [cancer](#), so the side-effects of their treatment are an important issue for them. If we can develop a test that means people can reduce the risk of these problems that will be of huge benefit to this group."

**More information:** Sarah L. Kerns et al. Meta-analysis of Genome Wide Association Studies Identifies Genetic Markers of Late Toxicity Following Radiotherapy for Prostate Cancer, *EBioMedicine* (2016). [DOI: 10.1016/j.ebiom.2016.07.022](https://doi.org/10.1016/j.ebiom.2016.07.022)

Provided by University of Manchester

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