

Genetic screening can identify men with advanced prostate cancer

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Screening men with a family history of prostate cancer for a range of gene mutations can identify those who are at high risk of aggressive forms of the disease and in need of lifelong monitoring, a new study has shown.

Scientists at The Institute of Cancer Research, London, found screening of [men](#) who had multiple relatives with prostate cancer was able to pick up 14 [mutations](#) in known cancer genes that predicted the development of the disease.

The research was mainly funded by Prostate Cancer UK with additional support from Cancer Research UK, and is published in the *British Journal of Cancer* today (Friday).

The findings are important because they demonstrate not only that some men have a genetic profile that puts them at higher risk of prostate cancer, but that particular genetic profiles match to a higher risk of advanced, invasive disease. A big challenge facing prostate cancer researchers is to find ways of predicting which men will have life-threatening forms of the disease, to allow treatment to be tailored more effectively.

Scientists at The Institute of Cancer Research (ICR) analysed blood samples from 191 men with prostate cancer at several different UK centres. They were able to use new 'second generation' DNA sequencing technologies to assess mutations in 22 different known cancer genes at

once – opening up for the first time the prospect of rapid genetic screening for prostate cancer for a wide range of mutations.

The researchers looked at men with a history of three or more cases of prostate cancer in their close family, in order to mirror use of family history as a criterion for existing gene testing programmes in breast cancer.

The researchers found 13 'loss of function' mutations – which prevent the genes from producing a properly working protein – in eight DNA repair genes. The genes tested for were BRCA1 and BRCA2, which are already routinely tested for in women with a strong family history of breast or ovarian cancer, plus ATM, CHEK2, BRIP1, MUTYH, PALB2 and PMS2.

Men with any of these 13 mutations were much more likely than those without to develop an advanced, invasive form of cancer which spread to the lymph nodes or other parts of the body, and to die from the disease.

Study co-leader Professor Ros Eeles, Professor of Oncogenics at The Institute of Cancer Research, London, and Honorary Consultant at The Royal Marsden NHS Foundation Trust, said:

"Our study shows the potential benefit of putting prostate cancer on a par with cancers such as breast cancer when it comes to genetic testing. Although ours was a small, first-stage study, we proved that testing for known cancer mutations can pick out men who are destined to have a more aggressive form of prostate cancer.

"We already have the technical capabilities to assess men for multiple mutations at once, so all that remains is for us to do further work to prove that picking up dangerous mutations early can save lives. If so then in the future, [genetic testing](#) may be needed as part of the prostate cancer

care pathway."

Fellow study co-leader Dr Zsofia Kote-Jarai, Senior Staff Scientist at The Institute of Cancer Research, London, said:

"One of the important messages to come out of our study is that mutations to at least eight genes – and probably many more – greatly increase the risk of aggressive prostate cancer. Any future screening programme would need to assess as many of these genes as possible – more than we currently look for in women at risk of [breast cancer](#), for example."

Dr Iain Frame, Director of Research at Prostate Cancer UK, said:

"The minefield of prostate cancer diagnosis is one of the biggest hurdles facing treatment of the disease today. Current tests fail to differentiate between aggressive cancers that could go on to kill, and cancers that may never cause any harm. This lack of clarity means that too often men and their doctors are left having to make incredibly difficult decisions on whether to treat the disease or not.

"We urgently need to understand more about which men are at risk of developing prostate cancer and in particular aggressive forms of the disease. Genetic testing to predict risk could revolutionise how we treat the 40,000 men diagnosed with the disease every year in the UK. These results are exciting as they add to the growing weight of evidence that men with a [family history](#) of [prostate cancer](#) who possess certain genes may be at higher risk, providing us with another crucial piece of the jigsaw."

Provided by Institute of Cancer Research

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