

Genesis Research

Prediction Projects

Our Aim:

- To predict which women are most susceptible to breast cancer.

Our Objectives:

- To identify women as high, medium or low risk through gene, lifestyle and breast density testing.
- To undertake further research into high risk genes and gene fragments (SNPs).
- To increase the frequency of screening for high risk women.

Predicting the Risk of Cancer at Screening (PROCAS)

The PROCAS study led by Professor Gareth Evans aims to determine whether it is feasible to accurately predict each woman's personal breast cancer risk when they attend routine breast screening. All women aged between 47 and 73 who attend routine breast screening mammograms as part of the NHS Breast Screening Programme in Greater Manchester are being invited over three years to join the study and it is expected that 55,000-60,000 women will agree to participate in this research. The study is being run from The Genesis Prevention Centre at University Hospital of South Manchester.

Data is being collected on the following breast cancer risk factors: mammographic breast density (the amount of dense tissue in the breast), lifestyle factors, reproductive factors and family history. Together these factors are used to give an overall risk score for each woman. In addition, 10,000 women are being invited to provide a saliva DNA sample which will be tested for genetic changes (single nucleotide polymorphisms [SNPs] thought to be associated with breast cancer risk).

PROCAS is the first study to investigate the use of these genetic tests on women who undergo routine screening. All women are given the choice of finding out their personal risk of breast cancer and so far 95% of women participating in the study have indicated a desire to know their risk at time of consent to the study. Any women who have chosen to know their risk and are high-risk are offered a consultation with an expert at The Nightingale Centre and Genesis Prevention Centre (Professor Howell

or Professor Evans). Women are given advice on ways of reducing their risk and if appropriate, may be offered more frequent screening and preventive measures. To date 315 high risk women have been seen, and 141 have been referred for more frequent screening (18-monthly screening, as opposed to three-yearly). Of these women, three have had breast cancer detected on their extra mammogram. This means that for these three women, their cancer was detected potentially up to 18 months sooner than it would have been had they not joined the PROCAS study.

If the PROCAS study can demonstrate that it is feasible to accurately predict and feedback breast cancer risk to women attending routine breast screening, then this process of personalised risk prediction could be incorporated into the screening process. In the longer term there may also be the potential for women's mammographic screening interval to be altered based on personal breast cancer risk (i.e. women at increased risk receiving more frequent screening).

As a result of PROCAS, University Hospital of South Manchester now has the largest number of participants recruited into a research study in the UK. Although recruitment started more slowly than expected, following feedback the PROCAS research team have now placed staff on the vans to explain the project in more detail to potential participants. They have also held many successful open days on Saturdays for women to donate their saliva samples. To date (May 2013), over 51,000 women have agreed to take part in PROCAS and over 7,180 saliva samples have been collected.

Genesis has also funded SNP research, which is being carried out within the PROCAS study. For the last 5-10 years the family history population has been the focus of prediction studies; however as the PROCAS study is being run within the national breast screening programme, we are now including women from the general population in our prediction research.

The study is funded by the National Institute for Health Research, with additional support from Genesis for special data capture software, the DNA kits to test women's saliva samples and the extraction of DNA from the samples.