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Success achieved with a new ovarian cancer screening technique



## INNOVATION ARTICLES

### THE IDEA SUBMISSION PORTAL FROM MEDTRONIC



## SUCCESS ACHIEVED WITH A NEW OVARIAN CANCER SCREENING TECHNIQUE

Fiona Dunlevy  
August 2015

Sometimes success lies not in the medical device, but in the way you use it. A team from University College London (UCL) has been making waves with a new screening technique for ovarian cancer that doubles the rate of detection. The key to their success did not lie in an innovative new device, but rather in optimising how the existing device is used.

Ovarian cancer is the fifth most common cancer in women in the UK, with a 10 year survival rate of just 35%. Early diagnosis can make a big difference to boosting survival. Currently, women are screened for ovarian cancer by measuring the amount of a biomarker protein called CA125 in the blood. The test is a simple ELISA (for enzyme linked immunoabsorbent assay), which uses specific antibodies and enzymes to recognise, tag



CA125 blood levels, and not every woman with high CA125 levels has a tumour. The test wasn't considered accurate enough to be used in screening programmes, but some researchers thought it had enough promise to be investigated further.

The UK Collaborative Trial of Ovarian Cancer Screening (UKCTOCS) involving over 200,000 post menopausal women provided just the opportunity to see if CA125 could be made useful. As part of this 14 year study, 46,237 women had yearly CA125 tests. A computer algorithm called the "risk of ovarian cancer algorithm" (ROCA) then crunched these serial values to see if the pattern of change in CA125 levels over time corresponded to the patterns of change seen in ovarian cancer patients. If the patient was classified as having intermediate or elevated risk, they went on to have further tests and investigations to confirm the diagnosis.

ROCA screening detected invasive ovarian cancers with 86% sensitivity, meaning that 86% of women who had ovarian cancer were correctly identified by ROCA screening. This was a much better outcome than the traditional fixed value "threshold" screening, which correctly detected only 41-66% of cancers, depending on the CA125 threshold used.

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Professor Ian Jacobs, co-inventor of the algorithm for change in CA125 levels and chief investigator of UKCTOCS was pleased with the result. "What's normal for one woman may not be so for another," said Jacobs in a press release, "it is the change in levels of this protein that's important.

In the study, annual CA125 screening led to 640 women undergoing surgery for suspected cancer, of whom 133 actually had invasive ovarian cancers. The team don't yet know whether the increase in cancer detection will result in saved lives. "We need to wait until later this year when the final analysis of the trial is completed to know whether the cancers detected through screening were caught early enough to save lives," said Professor Usha Menon in a press release. Menon is co principal investigator of UKCTOCS and trial co-ordinator at UCL. "There is currently no national screening programme for ovarian cancer, as research to date has been unable to provide enough evidence that any one method would improve early detection of tumours. These results are therefore very encouraging. They show that use of an early detection strategy based on an individual's CA125 profile significantly improved cancer detection compared to what we've seen



Early detection and diagnosis is important, not just for ovarian cancer, but for most diseases. However, diagnostic tests are only as good as the normal ranges of values that they are compared against. In this era of personalised medicine, researchers are starting to realise that diagnostics also needs to be personalised and that the concept of the “normal range” may be outdated. Who knows how many diagnostic tests could be super-performers, if only used under the correct conditions? Innovation doesn’t just mean new devices, it also means giving a new lease of life to existing ones such as the CA125 ELISA.

## REFERENCES

<sup>1</sup> <http://jco.ascopubs.org/content/early/2015/05/08/JCO.2014.59.4945.abstract>

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