Screening for cervical cancer to be revolutionised with HPV testing

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Credit: University of Sydney

Groundbreaking technology patented by University of Sydney researchers will be used in the new National Cervical Screening Program to be implemented in Australia from 1 December 2017.

Based on new evidence and better technology, the National Cervical Screening Program is changing by replacing the traditional pap smear with a new test which detects human papillomavirus (HPV) infection, in effort to improve early detection. While the current Pap test can detect abnormal cell changes, the new Cervical Screening Test will detect HPV infection that can cause the abnormal cell changes prior to the development of cancer. Persistent HPV infection is the cause of almost all cervical cancers. However, this usually takes a long time to develop, often more than 10 years.

The procedure for collecting the sample for HPV testing is the same as the procedure for having a Pap smear – a healthcare provider will still take a small sample of cells from the woman's cervix, and the sample will be sent to a pathology laboratory for testing.

The technology to detect HPV was originally invented by University of Sydney researcher Professor Brian Morris, and Dr Brian Nightingale when in the Department of Clinical Biochemistry at Royal Prince Alfred Hospital, who together hold the world's first patent for the HPV technology lodged with the patent office in 1987. The University of Sydney patenting process in the US, Europe, Japan and Australia was funded by Roche Diagnostics.

"It is now well-established that high-risk HPV types are the cause of 99.9 per cent of cervical cancers," said Professor Morris, a molecular biology researcher from Sydney Medical School's Bosch Institute and School of Medical Sciences.

"Testing for HPV is more accurate than pap smears and will save more women from getting cervical cancer. The pap smear was invented over 70 years ago, so the change is welcome.

"The Australian Government has recognised the superiority of HPV

testing, so from 1 December we will switch to HPV testing for primary cervical screening of women in Australia.

"After three decades of hard work, I am very pleased that these changes are happening.

"The next step to further improve cervical screening is to make these tests more readily available to women, especially those who live in remote areas, are too busy, or who for religious or other reasons are averse to traditional sample collection, via a home-collection kit.

"We're currently working on making available a test where women can collect their own sample at home and mail to a lab for testing. Their nominated doctor would then be informed of the result and tell them if they need to attend for further examination.

"Being a molecular test that involves DNA (which is quite stable), the test lends itself to self-sampling at home by means of a tampon or other device. This will potentially improve uptake of cervical screening tests and prevent further cancers."

The technology used in the HPV testing is called 'the polymerase chain reaction' (PCR). At the time of Morris and Nightingale's invention, PCR had been developed to test for mutations in beta-globin that cause the genetic blood disease Thalassemia. The researcher's test was the first use of PCR for viral detection, specifically for detection of cancer-causing strains of human papillomavirus (HPV).

Human Papilloma Virus fast facts:

- The human papillomavirus (HPV) is a common infection in females and males.
- Many people will have HPV at some time in their lives and never

know it.

- There are more than 100 different types of HPV that can affect different parts of the body. HPV types 16 and 18 are those most commonly associated with cervical cancer. But over 10 other cancer-causing HPV types will be detected by the new test. Genital HPV is spread by genital skin to genital skin contact.
- Most HPV infections clear up by themselves without causing any problems. Persistent genital HPV infections can cause cervical abnormalities, which, if they continue over a long period (usually more than 10 years), can lead to cervical cancer.
- It is important to remember that most women who have HPV clear the virus and do not go on to develop cervical abnormalities or cervical cancer.

Provided by University of Sydney