Box 1: Thin-layer liquid-based cytology
(ThinPrep Pap Test, Cytyc Canada Ltd., Lucan, Ont.; AutoCyte PREP System, TriPath Imaging Inc., Burlington, NC)

Use: The cervical sample is suspended in a cell-preserving solution rather than placed on a glass slide. As a result, virtually all cellular material is made available to the laboratory. With a conventional Pap smear, only 20% of the cells harvested from the cervix are placed manually on the slide. With liquid-based cytology, excess blood and inflammatory cells are lysed, and about 50 000 diagnostic cells are randomly selected by machine and transferred onto a slide in a thin-layer fashion by a robotic cell processor. The slides are read by cytotechnologists.

Promise: The technique improves slide quality by reducing obscuring blood (99.8%) and inflammatory exudate (94.3%). In one study, the ThinPrep Pap Test increased detection rates of high-grade precancerous lesions among 154 872 women at low and high risk of cervical cancer by 26% to 233% compared with historical controls from a year earlier. The technique also permits panel testing for HPV DNA and Chlamydia trachomatis. The US Food and Drug Administration approved the ThinPrep Pap Test (1996) and the AutoCyte PREP System (1999) as being significantly superior and equivalent, respectively, to the conventional Pap smear for the detection of precancerous and cancerous lesions of the cervix.

Problems: Additional large-scale prospective studies using histological verification of cervical samples from women at low and high risk of cervical cancer who had negative results with liquid-based cytology are needed to estimate the test’s diagnostic performance. The data will help to assess the impact of liquid-based cytology for cervical cancer screening and to solve perceived problems with its additional costs and validity that are currently slowing its greater widespread use.