

Liquid-Based Techniques for Cervical Cancer Screening: Systematic Review and Cost-Effectiveness Analysis

Technology and Condition

Liquid-based cytology (with or without HPV testing) as an alternative to conventional cytology (CC) for cervical cancer screening of sexually active women who are 15 years of age or older.

Issue

Liquid-based cytology (LBC) is more expensive than CC. There is uncertainty about whether the use of this technology is justified.

Methods and Results

A systematic review and Bayesian meta-analysis, economic evaluation, and budget impact analysis were undertaken to compare CC, LBC, and LBC-based human papillomavirus (HPV) triage at one-, two-, and three-year screening intervals. Twenty studies of 68,114 participants suggested that LBC was 6% more sensitive and 4% less specific than CC, on average. An LBC-based HPV triage program could cost an additional \$6.35 per targeted individual. Compared to annual screening with CC, LBC with HPV triage every two years could reduce disease burden — 3,023 women screened would prevent one cancer-related death (a gain of 0.0002 QALYs) — and reduce costs (\$59 per person, discounted) while increasing colposcopy rates by 37.5%. The same screen annually leads to a larger reduction in disease burden (0.0007 QALYs) but increased average costs (\$23 per person, discounted) and colposcopy referrals by 63%.

Implications for Decision Making

- **LBC and CC perform similarly.** The clinical evidence suggests that LBC is similar to CC with respect to sensitivity and specificity. LBC is probably more sensitive and less specific, and may have a lower rate of unsatisfactory specimens.
- **LBC strategies can be cost-effective, but they increase colposcopy referrals.** Model projections suggest that LBC with HPV triage every two years can be cost-saving compared to an annual screening strategy with CC alone.
- **HPV triage is cost-effective.** Direct comparison of all screening and triage strategies show that annual screening with CC or LBC is always more costly and less effective than when paired with HPV triage. Adding HPV triage to annual CC can reduce colposcopy referrals by 5%. Compared to annual CC with HPV triage, LBC with HPV every two years will reduce disease burden further by 0.0004 QALYs, while increasing costs (\$52 per person, discounted) and colposcopy referrals by 72%.

This summary is based on a comprehensive health technology assessment available from CADTH's web site (www.cadth.ca): Krahn M, McLachlin M, Pham B, Rosen B, Sander B, Grootendorst P, Tomlinson G, John-Baptiste A, Frikemerid M, Hong Chen M, Woo G, Anonychuk A, Carcone S, Witteman H, Chen W, Liu K, Sampson M, Tricco A. *Liquid-based techniques for cervical cancer screening: Systematic review and cost-effectiveness analysis.*