

Human Papillomavirus (HPV) DNA Testing

Test Update

May 27, 2005

Overview

Cervical cancer represents one of the most common forms of cancers found in women worldwide, with ~400,000 cases diagnosed each year. Epidemiologic and molecular studies have shown a strong association with genital human papillomavirus (HPV) infection. It is estimated that less than five percent of women infected with HPV who receive no health intervention ultimately develop cervical cancer (1). Infections with HPV are common in both men and women, with a 75% increased lifetime risk of infection in women. There are over 50 viral types of HPV that infect the genital tract. Only a small portion appears to cause cervical cancer and these are known as high risk types (16, 18, 31, 45, 33, 35, 39, 51, 52, 56, 58, 68). Virtually, all genital warts are caused by types 6 and 11, which are also known as low risk types. Infection with low risk HPVs rarely lead to cancer (1, 2).

Each year approximately 50 million women undergo Papanicolaou (Pap) testing in the United States. Of these approximately 3.5 million are diagnosed with a cytological abnormality requiring additional follow-up or evaluation (2). 2002 guidelines and recommendations for managing the group of women with atypical squamous cells of undetermined

significance (ASC-US) include repeat Pap smear, colposcopy, or DNA testing for high-risk HPV genotypes (2). If liquid-based cytology is used or co-collection for HPV DNA testing is possible, reflex HPV DNA testing is preferred.

In August 2003, the American College of Obstetrics and Gynecology issued updated clinical management guidelines for obstetrician-gynecologists. These revised guidelines state that a combination of Pap smear and HPV DNA screening is appropriate for women aged >30 years; and if results are negative in both tests, women should be re-screened no more than every 3 years (3).

HPV cannot be cultured reliably in a laboratory setting; therefore, HPV testing relies on molecular techniques that detect HPV DNA in cervical samples (4). Because there are so many HPV types with differing carcinogenic potential, HPV DNA testing is designed to determine if one or more high-risk types are present in a specimen (4, 5).

PathGroup labs uses FDA approved technology (Hybrid Capture 2, Digene, Inc) for HPV DNA testing and has been performing both low and high risk HPV probes on diagnostic and reflexed orders.

Clinical Utility

- Diagnostic screening for cervical cancer.
- HPV testing for the triage of patients showing atypical squamous cells of undetermined significance (ASC-US).
- HPV testing associated with high-grade squamous intraepithelial lesions (HSIL).
- HPV testing associated with low grade squamous intraepithelial lesions (LSIL).
- Repeat HPV testing in patients with previous positive testing for HPV and negative cytology.
- Follow-up testing after the treatment.

Methodology: Hybrid Capture 2 (Nucleic Acid Signal Amplification Assay).

Specimen Collection: ThinPrep™ Solution (4ml), or Digene STM.

Shipping and Handling: Specimens are stable at room temperature.

Reference Ranges: Not Detected

Turnaround Time: Next Day

References

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2. Wright, Thomas C. Jr MD; Cox, J. Thomas MD; Massad, L. Stewart MD; Twiggs, Leo B. MD; Wilkinson, Edward J. MD. 2001 Consensus Guidelines for the Management of Women with Cervical Cytological Abnormalities.
3. American College of Obstetricians and Gynecologists. ACOG Practice Bulletin. Clinical Management Guidelines for Obstetrician-Gynecologists. Number 61, April 2005. Human papillomavirus. *Obstet Gynecol*. 2005 Apr;105(4):905-18.
4. Nicolas F. Schlecht, Robert W. Platt, Eliane Duarte-Franco, Maria C. Costa, João P. Sobrinho, José C. M. Prado, Alex Ferenczy, Thomas E. Rohan, Luisa L. Villa, and Eduardo L. Franco. Human Papillomavirus Infection and Time to Progression and Regression of Cervical Intraepithelial Neoplasia *J Natl Cancer Inst* 2003; 95: 1336-1343.
5. Cuzick J. Role of HPV testing in clinical practice. *Virus Res*. 2002 Nov;89(2):263-9.