

HPV GENOTYPING



INTRODUCTION

Of the 14 recognized high-risk types of HPV, types 16 and 18 are highly prevalent and more oncogenic than other high-risk types^{1,2}. Specifically, high-risk types 16 and 18 have been reported to cause **70% of cervical cancers** and 90% of the head and neck cancers caused by HPV. Studies have shown that women with HPV type 16 cervical infections are at greater risk of developing CIN3+ compared to other high-risk types. Women with normal cytology that are HPV type 18 positive not only have an increased risk of CIN3+, but also adenocarcinoma^{3,4}. Regarding head and neck cancers, nearly 50% of all oropharyngeal cancers and up to 15% of oral cancers are attributable to HPV⁵.

HPV VACCINE

On June 8, 2006, the FDA licensed the first vaccine developed to prevent cervical cancer and other diseases in females caused by certain types of HPV. The quadrivalent vaccine, Gardasil®, protects against four HPV types (6,11,16,18). Additionally in 2006, the Advisory Committee on Immunization Practices (ACIP) voted to recommend use of this vaccine in females, ages 9-26 years⁶. Ideally, the vaccine should be administered before the onset of sexual activity. Nonetheless, females who are sexually active may also benefit from vaccination. Females who have not been infected with any type of HPV would receive the full benefit of vaccination. Females who already have been infected with one or more HPV types would still get protection from the vaccine types they have not acquired. Although Gardasil was specifically developed for females in the 9-26 age range, it stands to reason that the vaccine for HPV high-risk types 16 and 18 would also be effective at preventing head and neck cancer.

CLINICAL MANAGEMENT

Knowing a patient's HPV type provides clinicians with valuable information to guide follow up treatment and vaccination. A recent article in Gynecologic Oncology reviews the **clinical utility of HPV genotyping**⁷. Women who are infected with the more oncogenic high-risk types and are cytology negative should be monitored more closely. Several studies have demonstrated that cytology negative women that are positive for high-risk type 16 or 18 are at greater risk of having or developing CIN3+ than women with LSIL cytology; thus, a repeat PAP smear to confirm both the cytology and HPV is recommended. For women over 30 who repeatedly test positive for HPV 16 or 18 but are cytology negative, more frequent follow-ups (every 6-12 mos. vs. 2 years) are warranted because of the higher risk for developing CIN-3+.

GENETIC ASSAYS HPV DNA DETECTION AND GENOTYPE TESTING

Genetic Assays' Test #7575, HPV Genotyping, is performed by polymerase chain reaction (PCR) with DNA sequencing. It provides clinicians with the **specific HPV type** present in the patient sample. For initial detection, Test #395 or #395H HPV DNA by Hybrid Capture II (HCII)® can be performed, with reflex to genotyping recommended for positive (detected) HPV DNA. Samples that have previously tested positive (by HCII® or PCR) can also be reflexed to #7575 HPV Genotyping to determine the specific HPV type in the patient sample.

Genetic Assays' HPV Test Menu	<input type="checkbox"/> #395	HPV DNA by HCII®
	<input type="checkbox"/> #395H	HPV DNA by HCII® High Risk Only
	<input type="checkbox"/> #7575	HPV Genotyping
	<input type="checkbox"/> #395 / 7575	HPV DNA by HCII® / reflex to HPV Genotyping
	<input type="checkbox"/> #395H / 7575	HPV DNA by HCII® High Risk Only / reflex to HPV Genotyping

ACCEPTABLE SAMPLES

ThinPrep™, SurePath™, Cervical or Urethral Swab, Tissue Biopsy (fresh or paraffin)
For other acceptable specimens, please contact Genetic Assays, Inc.

REFERENCES

1. Castle PE, Solomon D, Schiffman M, Wheeler CM. Human papillomavirus type 16 infections and 2 year absolute risk of cervical precancer in women with equivocal or mild cytological abnormalities. J. Nat'l Cancer Inst 2005; 20(97): 1066-71
2. Khan MJ, Castle PE, Loricz AT, et al. The elevated 10-year risk of cervical precancer and cancer in women with human papillomavirus (HPV) type 16 or 18 and the possible utility of type-specific HPV testing in clinical practice. J Nat'l Cancer Inst 2005; 20(97): 1072-9
3. Bulk S, Berkhof J, Bulkman NW, et al. Preferential risk of HPV16 for squamous cell carcinoma and of HPV 18 for adenocarcinoma of the cervix compared to women with normal cytology in the Netherlands. BrJCancer2006; 94:171-5
4. Castellsague X, Diaz M, de Sanjose S, et al. Worldwide human papillomavirus etiology of cervical adenocarcinoma and its cofactors: implications for screening and prevention. J Nat'l Cancer Inst 2006; 98:303-15
5. D'Souza, G. New England Journal of Medicine, May 10, 2007; vol 356: pp 1944-1956.
6. Sexually Transmitted Diseases Treatment Guidelines, 2006.MMWR 2006; 55 [No. RR-11].
7. Meijer CJ, Snijders PJ, Castle PE, Clinical utility of HPV genotyping. Gynec Onc 2006; 103:12-17