Association Between Physician Specialty and Uptake of New Medical Technologies: HPV Tests in Florida Medicaid

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BACKGROUND: It is well established that specialists often adopt new medical technologies earlier than generalists, and that racial and ethnic minority patients are less likely than White patients to receive many procedures and prescription drugs. However, little is known about the role that specialists or generalists may play in reducing racial and ethnic disparities in uptake of new medical technologies. Human papillomavirus (HPV) DNA tests, introduced as a cervical cancer screening tool in 2000, present a rich context for exploring patterns of use across patient and provider subgroups.

OBJECTIVE: To identify patient characteristics and the provider specialty associated with overall and appropriate use of HPV DNA tests over time, and to examine the associations between clinical guidelines and adoption of the test in an underserved population.

DESIGN: Retrospective longitudinal study using Florida Medicaid administrative claims data.

PARTICIPANTS: Cervical cancer screening test claims for 415,239 female beneficiaries ages 21 to 64 from July 2001 through June 2006.

MAIN MEASURES: Overall and appropriate use of HPV DNA tests.

KEY RESULTS: Although minority women were initially less likely than White women to receive HPV DNA tests, test use grew more rapidly among Black and Hispanic women compared to White women. Obstetricians/gynecologists were significantly more likely than primary care providers to administer HPV DNA tests. Release of the first set of clinical guidelines was associated with a large increase in the use of HPV DNA tests (adjusted odds ratio: 2.46, $p < 0.0001$); subsequent guidelines were associated with more modest increases.

CONCLUSIONS: Uptake of new cervical cancer screening protocols can occur quickly among traditionally underserved groups and may be aided by early adoption by specialists.

KEY WORDS: clinical guidelines; appropriate use; disparities; cancer screening; technology adoption.

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INTRODUCTION

It is well established that specialists often adopt new medical technologies earlier than generalists¹⁻⁵, and that White patients are more likely than racial and ethnic minority patients to receive many devices and prescription drugs, including hip and knee replacements, vaccinations, and medicines for HIV infection or depression⁶⁻⁸. Overuse by White patients may explain some of these differences (see, for example,^{9,10}); however, studies suggest that minority patients receive fewer clinically important, necessary services than White patients⁹⁻¹². Little is known about the role that specialists or generalists may play in reducing racial and ethnic disparities in the use of medical technologies.

Cervical cancer screening tests are widely used technologies that present a rich context for exploring patterns of use across patient and provider subgroups. Although most women in the United States receive Pap tests more frequently than recommended by clinical practice guidelines¹³, underuse of cervical cancer screening tests is also common, particularly among those with lower incomes and Medicaid coverage^{14,15}. Screening intervals are wider for Black and Hispanic women than for White women^{16,17}, and narrower for women who see gynecologists rather than primary care providers¹⁸.

Until 2000, cervical cancer screening was conducted solely using Pap tests, which detect cervical abnormalities before they progress, allowing for early treatment. In 2000, the Food and Drug Administration (FDA) approved Digene Corporation's (now QIAGEN, Valencia, CA) human papillomavirus (HPV) DNA test for follow-up of equivocal Pap test results, referred to as atypical squamous cells of uncertain significance (ASC-US). In March 2003, the FDA approved a second indicated use, HPV DNA testing for primary screening in women over age 30, in conjunction with the Pap test¹⁹. Primary screening in women under age 30 is not recommended, as there is a high prevalence of spontaneously resolving transient HPV infections among younger women²⁰.

Between April 2002 and February 2004, five sets of cervical cancer screening guidelines were released by professional associations and consensus groups²⁰⁻²⁴. With the exception of guidelines from the US Preventive Services Task Force, which cited insufficient evidence to recommend for or against

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routine screening for HPV infection²¹, the guidelines generally agreed that HPV DNA testing is one option for following up ASC-US Pap test results, and for use in combination with a Pap test in women age 30 and over (Appendix)²⁰⁻²⁴. Guidelines from the American College of Obstetrics and Gynecology (ACOG) recommended that (1) HPV DNA tests be used for follow-up of Pap test results deemed ASC-US, regardless of the woman's age, and (2) it is appropriate to administer HPV DNA tests at the same time as a Pap test for women age 30 and older²³. In 2004, interim guidance released by a consensus panel of National Institutes of Health-National Cancer Institute, American Society of Colposcopy and Cervical Pathology (ASCCP), and American Cancer Society (ACS) concurred that HPV DNA testing may be added to Pap testing for primary screening of women age 30 and older²⁰.

Complementary use of Pap tests and HPV DNA tests can reduce cancer incidence and mortality substantially and cost-effectively²⁵; however, little is known about the factors associated with uptake of new cancer screening tests, especially among those of lower socioeconomic status, who experience higher morbidity and mortality from cervical cancer than the general population²⁶.

To assess patterns of HPV DNA test adoption in an underserved population, and to identify patient race/ethnicity and provider specialty associated with HPV DNA test use from July 2001 through June 2006, I used medical claims data for Medicaid beneficiaries in Florida, an ethnically diverse state with high cervical cancer incidence²⁷. I measured the absolute uptake of HPV DNA tests over time and after the introduction of multiple sets of clinical guidelines; calculated the degree to which the technology was used in a manner consistent with those guidelines; and assessed whether uptake of HPV DNA tests occurred at differential rates for Medicaid beneficiaries of different races and ethnicities, and for physicians of different specialties. I hypothesized that clinical guidelines would be associated with significant increases in HPV DNA test use, that White beneficiaries would be more likely to receive the tests than Black or Hispanic beneficiaries, and that obstetricians/gynecologists would be more likely to administer the tests than generalists.

METHODS

Data

I used linked enrollment and claims files from the Florida Medicaid program for the period July 2001 through June 2006, analyzing data for female patients between the ages of 21 and 64. To ensure that the data included a complete claims history for each woman, the study included only those eligible for Medicaid through Aid to Families with Dependent Children or Temporary Assistance for Needy Families (AFDC/TANF), family planning, or pregnancy. To allow for adequate assessments of cervical screening and follow-up, only those participants enrolled in Medicaid for at least 12 consecutive months were included. Women who had a hysterectomy during the study period were excluded, as guidelines do not recommend that they receive cervical cancer screening¹⁹; however, I could not identify and exclude women with a previous hysterectomy.

Outcome Variables

Cervical screening utilization, including HPV DNA test use, was identified according to Current Procedural Terminology (CPT) codes (Appendix B).

According to FDA-approved indications, there are two appropriate uses of HPV DNA tests: for primary screening in conjunction with a Pap test for women age 30 and older, and for triage of ASC-US Pap test results. Although clinical guidelines from professional organizations differ in the strength of their language, all guidelines offering a recommendation on HPV DNA tests concur that these two uses are appropriate.

For the primary screening indication, HPV DNA tests were deemed "appropriate" if claims were submitted for the same day as Pap test claims for women age 30 and older, and "inappropriate" if submitted for the same day as Pap test claims from women under age 30 in the absence of an ASC-US diagnosis. For the ASC-US triage indication, HPV DNA test claims were considered "appropriate" if accompanied by an ASC-US diagnosis code for women of any age. ASC-US diagnosis was identified in the data according to its International Classification of Diseases, Ninth Revision, Clinical Modification Code (ICD-9-CM) 795.01. A small number of HPV DNA tests in the sample could not be classified into these categories; these tests were deemed "appropriate" to allow for physician discretion to administer tests for non-guideline uses.

The diagnostic code for ASC-US was first introduced in October 2002²⁸, and frequent use of the code did not appear in Florida Medicaid claims until October 2004. Since ASC-US diagnosis codes were impossible to use in the first portion of the study period, and likely underused until late 2004, some HPV DNA tests used for ASC-US triage are missed by relying upon the ASC-US diagnosis code alone. To identify tests used for ASC-US triage that were not claimed using the diagnosis code, I estimated which HPV DNA test claims were associated with HPV positive patients, and assumed that an equal number of patients were HPV-negative, since clinical trials have found that approximately half of those with ASC-US Pap test results are HPV-positive²⁹. I identified HPV positive patients as those who received an HPV DNA test and then had a claim with an HPV-positive diagnosis (ICD-9 code 795.05), or a procedure code for a colposcopy (Appendix), the recommended follow-up for HPV-positive diagnosis, within 3 months.

Clinical practice guidelines recommend the HPV DNA test as an option, rather than as a preferred alternative, so failure to administer an HPV DNA test for a recommended purpose was not considered in the analysis of appropriate use. Appropriateness was only assessed for HPV DNA tests that were conducted, not for all situations in which they could have been conducted appropriately.

Explanatory Variables

The independent variables in the study included patient age, race/ethnicity, Medicaid district, and total months of enrollment, as provided by the annual Medicaid enrollment files; provider specialty, according to whether the provider who submitted the claim for the most recent clinical visit was a primary care provider (including internal medicine specialists, family and general practice physicians, and nurse practi-

tioners), obstetrician/gynecologist, pathologist, or other specialty; and pathology lab volume, defined as “high” for those labs submitting more than 20,000 test claims in the dataset.

The passage of time was modeled using a variable ranging in value from 1 to 60, representing the months of the study period, where 1 indicated July 2001 and 60 indicated June 2006. The effects of the FDA approval and clinical guideline releases were modeled in several ways. The results of these models were generally similar; therefore, results are reported using the most readily interpretable approach: simple dummy variables for each of the events, assigned to zero for the months before each event, and to one beginning the month after the event through the end of the study period.

Statistical Analyses

I calculated the number of HPV DNA tests per 100,000 Medicaid beneficiaries, and the clinical indications and appropriateness of these test applications, using the definitions of appropriateness defined above, for each month of the data.

To account for correlation between repeated observations of the same patients over time, associations between predictors and HPV DNA test use were evaluated using generalized estimating equations (GEE) with a logit link. An exchangeable correlation matrix structure was assumed³⁰. Robust standard error estimates were used to account for patient clustering within providers³¹.

Models predicting the likelihood of receiving an HPV DNA test were conditional on having received any cervical screening test; models predicting the likelihood of receiving an “appro-

priate” HPV DNA test were conditional on having received an HPV DNA test. I examined differential uptake of the test across patient and provider groups by conducting tests of the interactions among patient race/ethnicity, provider specialty, and the time trend variable; significant interaction terms were retained in the final model. To ensure consistency in the definition of appropriate use, the time frame for the appropriate use analysis was limited to March 2003, the date of FDA approval of HPV DNA tests for primary screening, through the end of the study period, June 2006.

Statistical analyses were conducted with SAS version 9.1.3 (SAS Institute Inc, Cary, NC). Statistical significance was set at the 0.05 level, and all tests were two-sided.

RESULTS

The mean age of the Medicaid beneficiaries across the study period was 30 years; 40.4% of the women were White, 34.1% were Black, and 22.9% were Hispanic (Table 1). Forty percent received one or more Pap tests and/or HPV DNA tests during the study period, for a total of 310,427 cervical cancer screening tests. Overall, the proportion of beneficiaries receiving one or more HPV DNA tests was 2.9%, for a total of 13,550 HPV DNA tests. Of all HPV DNA tests for which provider specialty could be identified, 62.6% were performed by obstetricians/gynecologists, and 25.2% were performed by primary care providers.

HPV DNA test use increased steadily over the study period, rising from 0.6% of all cervical tests in July 2001 to 9.0% in

Table 1. Characteristics of Female Florida Medicaid Beneficiaries and of Their Cervical Cancer Screening Test Claims, July 2001–June 2006

Characteristic	Female Medicaid beneficiaries ages 21 to 64 (n=415,239)	All cervical cancer screening test claims (n=310,427)	HPV DNA test claims (n=13,550)
Age, years (%)			
21–29	46.7	54.3	60.0
30–64*	53.3	45.7	40.0
Race/ethnicity (%)			
White	40.4	41.2	38.5
Black	34.1	31.5	33.7
Hispanic	22.9	24.9	25.4
Other	2.6	2.4	2.4
Received a diagnosis of atypical squamous cells of uncertain significance (ASC-US) (%)†	1.2	3.4	17.5
Provider specialty (%)‡			
OB/GYN		44.3	62.6
PCP/GP		36.5	25.2
Other		19.2	12.2
Pathology lab volume (%)			
High volume§		53.5	62.5
No. of cervical screening tests received during study period (%)			
0	59.8		
1	21.1		
2	10.7		
3	4.6		
4+	3.8		
Received an HPV DNA test (%)	2.9		

*Turn 30 at some point during the study period

†ASC-US diagnosis can only be determined among those for whom a cervical screening test claim is filed

‡Provider specialty specified from the most recent clinical visit in the 3 months preceding test claim; proportions reported refer only to those tests for which provider specialty could be specified

§High-volume pathology labs are those that submitted claims for 20,000 or more cervical tests during the study period

June 2006. This rise corresponds to an increase from 16 HPV DNA tests per 100,000 Medicaid beneficiaries in July 2001 to 229 tests per 100,000 in June 2006 (Fig. 1). The proportion of tests attributable to appropriate use also increased substantially over time. Overall, 30.6% of HPV DNA tests were used inappropriately in primary screening of women under the age of 30, more than a quarter (26.6%) were used appropriately in primary screening of women over the age of 30, and an additional 31.1% were used appropriately for follow-up of ASC-US diagnoses. The remaining 11.7% of tests were used for other purposes deemed appropriate in my analyses. Primary screening in women age 30 and older remained relatively constant as a proportion of total HPV DNA tests from July 2001 through June 2006. Overall, over the course of the study period, 69.4% of HPV DNA tests were used in accordance with FDA-approved indications, ranging from approximately 61.5% in the latter half of 2001 to 79.9% in the first half of 2006.

In the multivariate model predicting any HPV DNA test use, the release of the first set of guidelines by the American Society for Colposcopy and Cervical Pathology in April 2002 was associated with a large increase in the use of HPV tests [adjusted odds ratio (AOR)=2.46, $p<0.001$] (Table 2). Some subsequent guideline introductions were significantly associated with more modest increases.

Interactions between the release of clinical guidelines by professional associations and clinical behavior by members of those associations were not significant in any of our models. For example, guidelines from the American College of Obstetricians and Gynecologists had no more effect on OB/GYNs than on other provider specialties.

Black and Hispanic women were less likely than White women to receive HPV DNA tests throughout much of the study period (AOR=0.66, $p<0.0001$ and AOR=0.49, $p<0.0001$, respectively), but HPV DNA test use grew more rapidly among minority women than among White women. By the end of the study period, the monthly rate of HPV DNA test use for Black and Hispanic women exceeded that for White women (Fig. 2).

Across all patient race and ethnic groups, specialists were significantly more likely than generalist providers to administer HPV DNA tests; the predicted probability of a patient of any

age or race/ethnicity receiving an HPV DNA test was 0.06 for those seeing an obstetrician/gynecologist and 0.03 for those seeing a primary care provider (Fig. 2). HPV DNA test use did not increase more rapidly among obstetricians/gynecologists than among primary care providers. However, obstetricians/gynecologists had a higher predicted probability of administering HPV DNA tests to their Black and Hispanic patients than to their White patients (0.07 and 0.06, respectively, vs. 0.05).

In multivariate models predicting *appropriate* HPV DNA test use for primary screening, clinical guideline releases were not consistently associated with appropriate use, and the proportion of HPV DNA tests administered appropriately did not differ across patients of different races/ethnicities or providers of different specialties (Table 3).

DISCUSSION

In this large study of Florida Medicaid beneficiaries, there were significant increases in both overall and clinically appropriate use of HPV DNA tests from July 2001 to June 2006. Many factors may have contributed to rising uptake, including marketing to health care providers, prominent journal articles, or lay press coverage. In addition, development and release of multiple sets of clinical guidelines may have helped to sustain adoption of HPV DNA tests in clinical practice, as uptake of the test increased greatly after the introduction of the first set of guidelines incorporating HPV DNA testing and increased further after some subsequent guideline releases.

Adoption of the HPV DNA test differed significantly across provider specialty and by patient race/ethnicity. Although no specialized training is needed to conduct HPV DNA tests, obstetricians/gynecologists were more likely than primary care providers to use HPV DNA tests overall. This finding is in keeping with previous research on specialists' differential adoption of diagnostic tests and treatments, including liquid-based cervical cancer screening tests⁵, antibiotics for *H. pylori* infection³, antiretroviral therapy for HIV⁴, and COX-2 inhibitors for arthritic and musculoskeletal pain².

Possible explanations for earlier adoption by specialists include a larger caseload of patients for whom the test is

Figure 1. HPV DNA test use per 100,000 Florida Medicaid beneficiaries ages 21 to 64, July 2001–June 2006.

Table 2. Adjusted Odds of Any HPV DNA Test Use Among Florida Medicaid Beneficiaries, July 2001 to June 2006

	Adjusted odds ratio (n=310,427; 13,550 HPV DNA tests)
Time trend (by month) (reference group is previous month)	1.01**
Clinical guidelines (reference group for each is all months before guideline release)	
Release of American Society for Colposcopy and Cervical Pathology (ASCCP) guidelines (4/02)	2.46***
Release of American Cancer Society (ACS) guidelines (11/02)	1.10
Release of United States Preventive Services Task Force (USPSTF) guidelines (1/03)	1.18*
FDA approval for primary screening in women age 30 and older (3/03)	1.13
Release of American College of Obstetricians and Gynecologists (ACOG) guidelines (8/03)	1.29***
Release of co-sponsored interim guidance (National Cancer Institute, ASCCP, and ACS) (2/04)	0.96
Age 30–64 (reference group 21–29)	0.86***
Diagnosis of atypical squamous cells of uncertain significance (ASC-US)	4.62***
Race/ethnicity (reference group White)	
Black	0.66***
Hispanic	0.49***
Provider specialty (reference group PCP/GP)	
OB/GYN	1.69***
Pathology lab volume (reference group medium/low volume)	
High volume	1.40***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.0001$

Adjusted odds of any HPV DNA test use (given receipt of a cervical cancer screening test), as determined by generalized estimating equations adjusting for the variables in the table, as well as interaction terms between race/ethnicity and time trend and race/ethnicity and provider specialty, fixed effects of residence in each of 11 Medicaid districts in Florida, total number of months enrolled in Medicaid, and initiation of a national consumer direct-to-consumer advertising campaign in March 2005

Odds ratios for race/ethnicity and provider specialty must be interpreted in light of their interaction with one another, and with the time trend. Figure 2 illustrates differential uptake in HPV DNA tests by race/ethnicity and provider specialty over time.

indicated; manufacturer marketing efforts that preferentially target specialists; or attendance at professional meetings at which guidelines are formulated and discussed several months or years before their formal publication. In addition, the USPSTF's statement that there was insufficient evidence to recommend use of the HPV DNA test may have disinclined primary care providers to use the test for its FDA-approved indications.

Although Black and Hispanic women receiving cervical screening were initially less likely to receive HPV DNA tests, over time their growth in usage met and surpassed that of White women. This difference in adoption rates was not explained by differences in patient age or Pap test results across racial/ethnic groups. However, HPV DNA test administration by obstetricians/gynecologists was higher among Black and Hispanic patients than among White patients. The

Figure 2. Adjusted interaction effects of HPV DNA test use among Florida Medicaid beneficiaries ages 21 to 64, by provider specialty and patient race/ethnicity. Note: Predicted probabilities from multivariate models including monthly time trend, date dummies for clinical guideline introductions, FDA approvals and advertising campaign launch, patient age, race/ethnicity, and ASC-US diagnosis, provider specialty, fixed effects of residence in each of 11 Medicaid districts in Florida, and total number of months enrolled in Medicaid. Models also include interaction effects for monthly time trend * patient race/ethnicity and provider specialty * patient race/ethnicity.

Table 3. Adjusted Odds of Appropriate HPV DNA Test Use Among Florida Medicaid Beneficiaries, March 2003 to June 2006

	Adjusted odds ratio (n=11,950, 6,929 appropriate tests)
Time trend (by month) (reference group is previous month)	1.03*
Clinical guidelines (reference group for each is all months before guideline release)	
Release of American College of Obstetricians and Gynecologists guidelines (8/03)	1.16
Release of co-sponsored interim guidance (National Cancer Institute, American Society for Colposcopy and Cervical Pathology, and American Cancer Society) (2/04)	0.99
Race/ethnicity (reference group White)	
Black	1.13
Hispanic	1.04
Provider specialty (reference group PCP/GP)	
OB/GYN	1.27
Pathology lab volume (reference group medium/low volume)	
High volume	1.03

*p<0.01

Adjusted odds of appropriate HPV DNA test use (given receipt of a HPV DNA test), as determined by generalized estimating equations adjusting for the variables in the table, as well as age, diagnosis of atypical squamous cells of uncertain significance (ASC-US), fixed effects of residence in each of 11 Medicaid districts in Florida, and total number of months enrolled in Medicaid, and initiation of a national consumer direct-to-consumer advertising campaign in March 2005

administrative data studied here do not allow for exploration of why this might be the case. Preferential treatment of minority patients by specialists has not been shown in other therapeutic areas. The finding is worthy of exploration, as this study's results suggest that specialists may play a potential role in ensuring that minority patients receive newly recommended technologies in a manner comparable to White patients.

Although rates of appropriate HPV DNA test use improved over the 5 years under study, by mid-2006, approximately one-fifth of the tests were still used inappropriately in primary screening of women under the age of 30. Considerable non-guideline use of the HPV DNA test is corroborated by surveys of cervical cancer screening providers³²⁻³⁵.

Clinical practice guidelines have the potential to promote appropriate use³⁶. However, in this study, guidelines were not associated with increases in appropriate HPV DNA test use. These findings are consistent with evidence that adherence to guidelines is often poor³⁷. Barriers to guideline adherence among physicians include lack of awareness, unfamiliarity or disagreement with guidelines; lack of motivation or self-efficacy to change existing practice; resistance from patients; and lack of time, resources, or financial incentives³⁸. Various strategies, such as reminders, educational outreach, information technology systems, and financial incentives, have been shown to overcome these barriers³⁹⁻⁴¹.

Limitations

This study has several limitations. First, screening tests may have been missed if claims were not submitted. However, regular cervical screening, including unrestricted use of HPV DNA testing, was a reimbursed service of Florida Medicaid throughout the study period, so it seems unlikely that a substantial number of these services were performed with no associated claims filed. Second, some HPV DNA tests deemed inappropriate by this study may have been simply miscoded or reasonable, discretionary uses of the test. For example, some health care providers may intentionally apply guidelines for women age 30 and over to patients in their late 20s.

Sensitivity analyses employing an age threshold of 28 for appropriateness of HPV DNA testing in primary screening yielded results very similar to the original findings, suggesting that the predictors of appropriate use I observed are not explained by health care providers' application of guidelines to younger women. Third, the effects of clinical guideline releases were modeled using simple dummy variables. This approach provided clear, easily interpretable illustrations of the associations between guidelines and increases in HPV DNA test use; however, it is difficult to distinguish the effects of guidelines released in close proximity to one another, or the effects of concurrent factors, such as marketing efforts and continuing medical education, that may have contributed to changes in HPV DNA test use. In addition, administrative claims data do not allow for interpretation of why some guidelines may have been more successful in promoting use than others. Finally, the clinical guidelines under study offered varying degrees of support for use of the HPV DNA test. While the guidelines differ in their recommendations regarding appropriate use of the test, all agree that certain uses are inappropriate. My analyses used the broadest definition of appropriate use in order to accord with all guidelines and to provide the most generous estimates of possible guideline effects on appropriate use.

CONCLUSIONS

Over time, a new screening technology diffused among Florida Medicaid beneficiaries such that Black and Hispanic women, who are at higher risk of developing cervical cancer, received the tests. As new medical technologies are introduced and clinical guidelines are released, special efforts should be made to educate primary care providers, who are likely to adopt new technologies later. Obstetricians/gynecologists helped to alleviate disparities in adoption of HPV DNA tests in this study, perhaps suggesting an important role for specialists in the diffusion of new technologies to groups with historically poor access to preventive services.

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CLINICAL PRACTICE GUIDELINES FOR THE USE OF HPV DNA TESTING, 2002–2004

	Consensus Guidelines from the American Society for Colposcopy and Cervical Pathology (April 2002) ²²	American Cancer Society Guidelines (November 2002) ²⁴	United States Preventive Services Task Force Guidelines (January 2003) ²¹	American College of Obstetricians and Gynecologists Guidelines (August 2003) ²³	Co-sponsored Interim Guidance from National Cancer Institute, American Society of Colposcopy and Cervical Pathology and American Cancer Society (February 2004) ²⁰
HPV DNA testing for triage of ASC-US Pap test results	Yes	Not addressed	Not addressed	Yes	Yes
HPV DNA testing in conjunction with Pap test for primary screening in women age 30+	Not addressed	<i>It would be reasonable to consider that for women aged 30 or over screening may be performed every 3 years using cytology combined with a test for high-risk HPV types</i>	Insufficient evidence to recommend for or against routine screening for HPV infection	Once a woman reaches age 30, <i>it is appropriate</i> for her to have the test for the HPV at the same time as the Pap	HPV DNA testing <i>may be added</i> to cervical cytology for screening in women aged 30 years and older

PROCEDURE CODES

Claim	Procedure codes
HPV DNA testing	87620, 87621, 87622
Thin preparation Pap testing	88142, 88143, 88174, 88175
Conventional Pap testing	88141, 88144, 88145, 88147, 88148, 88150-5, 88160-2, 88164-7
Colposcopy	57452, 57454
Clinical visit	99201-5, 99211-5, 99241-5, 99385-6, 99395-6
Hysterectomy	58150, 58152, 58200, 58210, 58240, 58260, 58262-3, 58267, 58270, 58275, 58280, 58285