MAYO CLINIC LABORATORIES

Test Definition: ATPCO

Anal ThinPrep Cytology with Human Papillomavirus (HPV) Co-Test, Varies

Overview

Useful For

Detection of malignant and premalignant changes

Detection of high-risk (HR) genotypes associated with the development of anal cancer

Individual genotyping of human papillomavirus (HPV)-16 and HPV-18, if present

May aid in triaging men and women with positive HR-HPV but negative anal Papanicolaou (Pap) smear results

The cobas HPV test is **not recommended for** evaluation of suspected sexual abuse.

Additional Tests

Test Id	Reporting Name	Available Separately	Always Performed
AHPV	HPV Anal Detect / Genotyping PCR	Yes	Yes

Testing Algorithm

When this test is ordered, a cytology screen and genotyping for high-risk human papillomavirus types will be performed.

Method Name

ATPCO: Light Microscopy
AHPV: Real-Time Polymerase Chain Reaction (PCR)

NY State Available

Yes

Specimen

Specimen Type

Varies

Necessary Information

1. The following information must accompany the specimen: Patient's name, medical record number, date of birth, sex, source (exact location and procedure used), date specimen was taken, name of ordering physician and pager number.

2. Submit any pertinent history or clinical information.

Specimen Required

Submit one of the following specimens:

Preferred

Specimen Type: Anus or rectum
Supplies: ThinPrep Media with Spatula and Brush Kit (T434)
Collection Container/Tube: Brush
Submission Container/Tube: ThinPrep
Specimen Volume: A minimum of 20 mL or entire collection
Collection Instructions:
1. Visualize the anal opening by retracting the buttocks.
2. Insert brush past internal anal sphincter until it abuts the distal rectal wall (4-5cm).
3. Rotate the brush 360 degrees and maintain lateral pressure on brush against the walls of the anus. The brush should bow slightly due to the pressure.
4. While rotating, slowly withdraw the brush.
5. Rotate at least 10 times while withdrawing the brush. This should take 20 to 30 seconds.
6. Immediately place brush in the ThinPrep solution and swish at least 20 to 30 seconds.
7. Dispose of the brush.
8. Tighten the cap so that the torque line on the cap passes the torque line on the vial.
9. Bag ThinPrep specimens individually as they tend to leak during transport.
10. Place labels on the vial and on the biohazard bag.

Acceptable

Specimen Type: Anus or rectum
Supplies: PreservCyt Vial (T536)
Collection Container/Tube: Dacron/polyester swab
Submission Container/Tube: PreservCyt solution vial
Specimen Volume: A minimum of 20 mL or entire collection
Collection Instructions:
1. Visualize the anal opening by retracting the buttocks.
2. Insert Dacron or polyester swab past internal anal sphincter until it abuts the distal rectal wall (4-5cm).
3. Rotate the swab 360 degrees and maintain lateral pressure on swab against the walls of the anus. The swab should bow slightly due to the pressure.
4. While rotating, slowly withdraw the swab.
5. Rotate at least 10 times while withdrawing the swab. This should take 20 to 30 seconds.
6. Immediately place swab in the ThinPrep solution. Swish at least 20 to 30 seconds in the ThinPrep solution.
7. Dispose of the swab.
8. Tighten the cap so that the torque line on the cap passes the torque line on the vial.
9. Bag ThinPrep specimens individually as they tend to leak during transport.
10. Place labels on the vial and on the biohazard bag.

Specimen Minimum Volume

See Specimen Required

Reject Due To

SurePath vial	Reject
Specimen containing CytoRich Red preservative fluid	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Ambient	21 days	THIN PREP

Clinical & Interpretive

Clinical Information

Persistent infection with human papillomavirus (HPV) can cause anal cancer, with approximately 90% of all anal cancers being associated with HPV infection. HPV is a small, nonenveloped, double-stranded DNA virus, with a genome of approximately 8000 nucleotides. There are more than 118 different types of HPV and approximately 40 different HPVs that can infect human anogenital mucosa. However, data suggests that 14 of these types (HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68) are considered high risk (HR) for the development of cervical and anal cancer and precursor lesions. Furthermore, HPV types 16 and 18 have been regarded as the genotypes most closely associated with progression to cancer. HPV-16 is the most carcinogenic and is associated with approximately 60% of all HPV-related cancers, while HPV-18 accounts for approximately 10% to 15% of HPV-related cancers.(1-3)

Sexually transmitted infection with HPV is extremely common, with estimates of up to 75% of all women being exposed to HPV at some point. However, almost all infected patients will mount an effective immune response and clear the infection within 2 years without any long-term health consequences.

DNA testing by real-time polymerase chain reaction (PCR) is a noninvasive method for determining the presence of anal HPV infection. Proper implementation of DNA testing for HPV may:
1. Increase the sensitivity of anal cancer detection
2. Reduce the need for unnecessary biopsy and treatment

Recent data suggests that individual genotyping for HPV types 16 and 18 can assist in determining appropriate follow-up testing and triaging of patients who are at risk for cervical cancer and may be useful in cases of possible anal cancer. Detection of HR HPV DNA, especially genotypes 16 and 18, may assist in triaging patients and determining appropriate management strategies.

Reference Values

ANAL THINPREP CYTOLOGY
Satisfactory for evaluation. Negative for intraepithelial lesion or malignancy.

HUMAN PAPILLOMAVIRUS (HPV)
Negative for HPV genotypes 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68

Interpretation

Cytology:
Suspicious or atypical results need further confirmation: clinical observation, repeat cytology, or perhaps appropriate biopsy.

Positive results should be confirmed by histologic examination of tissue before definitive therapy is instituted.

Human papillomavirus:
A positive result indicates the presence of human papillomavirus (HPV) DNA due to 1 or more of the following genotypes: 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68.

A negative result indicates the absence of HPV DNA of the targeted genotypes. Management of abnormal results requires consideration of baseline risk of anal cancer and prior anal cytology and HPV results.

For patients with an anal Papanicolaou (Pap) test result showing atypical squamous cells of undetermined significance (ASC-US) and who are positive for high-risk (HR) HPV, consider referral for anoscopy if clinically indicated.

For men and women with a negative anal Pap test result but who are positive for HPV-16 or HPV-18, consider referral for anoscopy if clinically indicated.

For men and women with a negative anal Pap smear, positive-HR-HPV test result, but who are negative for HPV-16 and HPV-18, consider repeat testing by both cytology and HR-HPV in 12 months.

Cautions

Cytology: No significant cautionary statements

Human papillomavirus:
The cobas human papillomavirus (HPV) test is US Food and Drug Administration (FDA) approved for cervical and endocervical samples collected in PreservCyt (ThinPrep) media. Other specimen types (eg, anal) are not considered FDA-approved sources; however, verification studies have been completed by Mayo Clinic Laboratories and Mayo Clinic in compliance with CLIA regulations.

The cobas HPV test detects DNA of the high-risk types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68. This test does not detect DNA of HPV low-risk types (eg, 6, 11, 42, 43, 44) since these are not associated with cervical cancer and its precursor lesions.

Prevalence of HPV infection in a population may affect performance. Positive-predictive values decrease when testing populations with low prevalence or individuals with no risk of infection.

Infection with HPV is not an indicator of cytologic high-grade squamous intraepithelial lesion (HSIL) or underlying

high-grade cervical intraepithelial neoplasia (CIN), nor does it imply that CIN2-3 or cancer will develop. Most patients infected with 1 or more high-risk (HR) HPV types do not develop CIN2-3 or cancer.

A negative HR-HPV result does not exclude the possibility of future cytologic HSIL or underlying CIN2-3 or cancer.

Anal specimens may show visibly detectable levels of whole blood or stool as a pink or light brown coloration. These specimens are processed normally on the cobas 4800 System. If concentrations of whole blood or stool are high, results may be impacted.

The cobas HPV test performance has not been validated with PreservCyt specimens that have been treated with glacial acetic acid for removal of red blood cells. Any such processing of PreservCyt specimens prior to HPV testing would invalidate the cobas HPV test results.

The cobas HPV test performance has not been validated with PreservCyt specimens that have been filled past the maximum fill line of the primary vial. ThinPrep vials that have had any additional PreservCyt fluid volume added or any dissimilar fluid volume added to the initial specimen should not be submitted for testing.

Human papillomavirus-negative cancers of the cervix or anus do occur in rare circumstances. Also, no cancer screening test is 100% sensitive. Use of this device for primary anal cancer screening should be undertaken after carefully considering the performance characteristics put forth in the cobas HPV test label as well as recommendations of professional guidelines.

The presence of real-time polymerase chain reaction inhibitors may cause false-negative or invalid results.

Anal specimens that are grossly contaminated with stool may yield invalid or false-negative results.

Clinical Reference

1. Swanson AA, Hartley C, Long ME, et al. Evaluation of high-risk human papillomavirus testing and anal cytology to detect high-grade anal intraepithelial neoplasia. J Am Soc Cytopathol. 2021;10(4):406-413. doi:10.1016/j.jasc.2021.03.007
2. Silva Dalla Libera L, Almeida de Carvalho KP, Enocencio Porto Ramos J, et al. Human papillomavirus and anal cancer: Prevalence, genotype distribution, and prognosis aspects from Midwestern region of Brazil. J Oncol. 2019;2019:6018269. Published 2019 Sep 18. doi:10.1155/2019/6018269
3. Wieland U, Kreuter A. Anal cancer risk: HPV-based cervical screening programmes. Lancet Infect Dis. 2019:19(8):799-800

Performance

Method Description

The specimen is collected by the physician during a procedure. This specimen will be processed using ThinPrep instruments to preserve cellular integrity. The slide is then stained with a Papanicolaou stain, coverslipped, and analyzed microscopically by a cytotechnologist and pathologist.(Instruction manuals: ThinPrep 2000 System Operator's Manual.

Hologic; MAN-02585-001 Rev. 006, 02/2017; ThinPrep 5000 Processor Operator's Manual. Hologic; MAN-02203-001 Rev. 002, 2016)

The cobas human papillomavirus (HPV) test targets and detects nucleic acid from the L1 region of the HPV genome using real-time polymerase chain reaction (PCR) technology. The cobas HPV test is used for the in vitro qualitative detection of 14 high-risk HPV types commonly associated with cervical cancer. The assay is able to specifically assess for the presence or absence of HPV genotypes 16 and 18, while concurrently detecting the remaining 12 high-risk types (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68). The cobas HPV test is used in conjunction with the cobas 4800 System.(Package insert: cobas HPV test. Roche Diagnostics; Version 05641268001-20E, 07/2021)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
3 to 6 days

Specimen Retention Time
Up to 1 week depending on results

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification
This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
88112
87626

LOINC® Information

Test Definition: ATPCO

Anal ThinPrep Cytology with Human Papillomavirus (HPV) Co-Test, Varies

Test ID	Test Order Name	Order LOINC® Value
ATPCO	Anal ThinPrep Cytology w/HPV CoTest	77653-4

Result ID	Test Result Name	Result LOINC® Value
614403	Interpretation	69965-2
614404	Participated in the Interpretation	No LOINC Needed
614405	Report electronically signed by	19139-5
614406	Addendum	35265-8
614407	Gross Description	22634-0
CY088	Source	22633-2
CY089	Clinical History	22636-5
614408	Disclaimer	62364-5
614409	Case Number	80398-1