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Medical Policy

Subject:	Optical Detection ~~Imaging Techniques~~ for Screening and Identification of Cervical Cancer		
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Description/Scope

This document addresses the use of optical detection ~~various technologies~~ for the screening and identification of cervical cancer~~, .including, cervicography, speculoscopy, and optical detection systems (for example, the Luma™ Cervical Imaging system, MediSpectra, Inc, Lexington, MA). These techniques use specialized technologies to visualize the cervix either as a replacement for, or as an adjunct to, colposcopy and human papilloma virus (HPV) testing.~~

Note: Colposcopy is considered the standard of care and is not addressed in this document.

Note: Please see the following related document for additional information:

- CG-MED-53 Cervical Cancer Screening Using Cytology and Human Papillomavirus Testing

Position Statement

Investigational and Not Medically Necessary:

~~Cervicography is considered **investigational and not medically necessary.**~~

~~Speculoscopy, with or without directed sampling, is considered **investigational and not medically necessary** as an adjunct to a program of cervical cancer screening including initial or repeat Pap smears or DNA testing for human papilloma virus (HPV).~~

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Medical Policy

Optical Detection~~Imaging Techniques~~ for Screening and Identification of Cervical Cancer

The use of optical detection ~~systems~~ for the detection or identification of cervical cancer~~, including but not limited to the Luma™ Cervical Imaging System,~~ is considered **investigational and not medically necessary.**

Rationale

~~Cervicography has been the subject of several randomized studies that have investigated its use in various settings, such as a primary screening technique, an adjunct to Papanicolaou (Pap) smear screening, and a triaging strategy for women found to have low-grade lesions on Pap smear.~~

~~*Cervicography as an Alternative to Pap Smear as a Primary Screening Technique*~~
~~Schneider and colleagues reported on a study comparing cervicography with, (1) conventional Pap smear, (2) a conventional Pap smear interpreted with the aid of PapNet (neural network semiautomatic screening device), and (3) a Pap smear prepared from a ThinPrep solution and interpreted conventionally (Schneider, 1999). The study included 8460 women from Costa Rica, considered a high-risk population for cervical cancer. Participants were referred for colposcopy and potential biopsy if there was an abnormal cytologic result by any one of the three methods listed above. The sensitivities and specificities of the cytologic testing and cervicography for the most clinically important high-grade lesions compared to a referent diagnosis* are summarized in the following table.~~

~~Table 1. Sensitivity of Cervicography and Cytology to Detect High-Grade Lesions~~

	~~Sensitivity of Cytology (%)~~	~~Sensitivity of Cervicography (%)~~
~~High-grade lesions, over 50 years old~~	~~84.6~~	~~26.9~~
~~High-grade lesions, under 50 years old~~	~~75.5~~	~~54.6~~

~~*Referent diagnoses were made based on histologic, cytologic, and cervicography results.~~

~~As noted in the above table, the sensitivity of cervicography sharply drops among older, predominantly post-menopausal women. This observation is explained by the upward movement of the transformation zone in postmenopausal women. The transformation zone is the site of origin of most cervical cancers and as it moves into the cervical canal, it is no longer well visualized with cervicography. The authors concluded that cytologic testing~~

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~~performed better than cervicography for the detection of high-grade intraepithelial lesions, while cervicography was only marginally better in the detection of invasive cervical cancer.~~

~~In a 2018 study by Singhakum and colleagues, the authors tested a new digital cervicography device made from a USB pen camera. This cervicography device connects with any Android device and takes both still photos and video clips. Testing of the device was done by comparing the performance of the camera to the assessment of cervical lesions using a modified colposcopic index (cervicograph score) with the cervical cytology and medical history. The study included 325 women in Thailand with no prior diagnosis or treatment of cervical lesions and no history of hysterectomy. All participants had cervical and vaginal cells collected for cytology and then all of them received the digital cervicography conducted with the new device and scored using a cervicograph score. The most common cervical cytology result was negative for intraepithelial lesion or malignancy (NILM), followed by atypical squamous cells of undetermined significance (ASC-US) and low-grade squamous intraepithelial lesion (LSIL). The cervical cytology results and cervicograph scores were divided into 2 subgroups; ≤ ASC-US and ≥ LSIL, and 0-3 points and 4-6 points, respectively. The odds ratio of cytology ≥ LSIL to detect cervical lesions CIN 2+ (cervical intraepithelial neoplasia) was 11.67 (95% confidence interval [CI], 5.83-23.36) compared with cytology ≤ ASC-US, and 84.98 (95% CI, 34.23-210.95) for cervicograph scores 4-6 points compared with 0-3 points. Cytologic results of ≥ LSIL to detect CIN 2+ lesions showed an accuracy of 76%, sensitivity 79.31%, specificity 75.28%, positive predictive value (PPV) 41.07%, and negative predictive value (NPV) 94.36%, and cervicograph scores 4-6 points to detect CIN 2+ lesions were 92%, 72.41%, 97%, 84%, and 94.18%, respectively. While the results of the digital cervicography device look promising, especially for its portability in areas where Pap is not available or there is a lack of cytologists, larger scale studies are necessary for generalization of the results.~~

~~*Cervicography as an Adjunct to Primary Pap Smear Screening*~~
~~The combined use of Pap smear screening, cervicography and HPV testing has been investigated as a technique to reduce the false-negative rate of Pap smear screening alone.~~

~~Autier and colleagues performed a randomized study comparing cytology alone vs. cytology and cervicography (Autier, 1999). A total of 5550 women considered at low risk of cervical neoplasia were randomized to one of the screening strategies and rescreened 1 year later with combined cytology and cervicography. Women positive for either of the two initial screening tests were referred for colposcopy-biopsy. The principal study endpoint was the rate of histopathologically confirmed CIN lesions. In the cytology only group, 13 of the 2772 (0.47%) Pap smears~~

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were read as abnormal. In contrast, in the combined group, 12 Pap smears were read as abnormal in addition to 101 cervigrams that were read as abnormal. No woman was positive for both Pap smear and cervigram. A total of 13 individuals in the cytology alone group were referred to colposcopy, compared to 113 in the combined group. CIN grades 2-3 was identified in 4 of the individuals in the cytology alone group compared to 6 in the combined group. Therefore, the majority with abnormal cervigrams were either found to have no lesion or CIN grade 1 on subsequent colposcopy. CIN grade 1 lesions are generally thought to be transient in nature and require no specific treatment, but may be followed with repeat Pap smears. While the addition of cervicography to cytology improved the detection of CIN grade 1 lesions, it did so at a cost of a decreased specificity. In addition, detection of CIN grade 2 and 3 lesions represents the most clinically significant target of screening.

Costa and colleagues reported on the results of 992 subjects undergoing routine Pap smears who underwent simultaneous cervicography and HPV testing (Costa, 2000). All subjects also underwent colposcopy as the reference tool. The combination of Pap testing with cervicography resulted in an increase in sensitivity but with a decrease in specificity. The positive predictive value of combined Pap and cervicography (43%) was similar to that of Pap smear alone (45%).

Cervicography as a Triaging Strategy in Women with Atypical Squamous Cells of Uncertain Significance (ASCUS) or Low-Grade Squamous Intraepithelial Lesions (LSIL) on Pap Smears
The ASCUS/LSIL Triage Study (ALTS) was a multicenter, randomized trial that compared three different management strategies for 3488 women with either ASCUS or LSIL on an initial Pap smear (Solomon, 2001). The strategies included: (1) immediate colposcopy (considered the reference standard); (2) triage to colposcopy based on the results of HPV testing; or (3) triage based on cytology results alone. The main study endpoint was detection of CIN grade 3, since there is a general consensus that this lesion has a high risk of progressing to invasive cancer and requires definitive treatment. All subjects also underwent cervicography, as a "fail safe" mechanism in the noncolposcopy groups to prevent a missed cancer diagnosis. The cervicography results were then interpreted separately as a triaging technique for mildly abnormal cervical cytology results by comparing the results of the cervicography with the histologic results of those who underwent colposcopy (Ferris, 2001). Cervigrams were categorized as defective, negative, atypical, and positive. Positive cervigrams were further subdivided into additional categories: positive, LSIL, high-grade intraepithelial lesions (HSIL), or cancer. Classifying an atypical cervigram as an indication for referral to colposcopy, the sensitivity of cervicography to detect CIN grade 3 lesions (i.e., high-grade lesion requiring treatment) was 79.3% and would have required the referral of 41.8% of women for colposcopic examination. When increasing the threshold for colposcopic referral to cervigrams interpreted as

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positive for LSIL, the sensitivity of detected CIN grade 3 dipped to 65.8%, requiring referral of 26.5% of women for colposcopic exam. In the ALTS trial, cytology and HPV testing were explored as triaging options. The following comparative results were reported:

Table 2. Comparison of Results for Triaging Strategies for Abnormal Pap Smears

-	Cervicography	Cytology	HPV Testing
Sensitivity for detecting CIN 3 lesions	79.3%	86.3%	96.3%
Percentage referred for colposcopy	37%	58%	56%
Positive predictive value for detecting CIN 3 lesions	8%	9%	10%
Negative predictive value for detecting CIN 3 lesions	99%	98%	99%

The authors conclude by stating that cost utility analyses will determine whether and when cervicography, compared with other clinical options, is useful in the management of mildly abnormal cervical cytology results.

Speculoscopy as an Adjunct to Routine Cervical Cancer Screening
Speculoscopy has been proposed as an adjunctive cervical cancer screening method. Therefore, to determine its clinical performance compared to conventional Pap smear screening alone, speculoscopy must be evaluated in prospective studies of subjects undergoing routine screening. To determine the sensitivity of speculoscopy compared to Pap smears, ideally all subjects would be referred to colposcopy, which is currently considered the gold standard.

Edwards and colleagues conducted a multicenter trial in a health maintenance organization (HMO) setting in which 689 participants undergoing routine Pap smear screening immediately underwent a speculoscopy at the same office visit. The exam was performed by nurse practitioners and midwives (Edwards, 1997). Those with positive findings on either Pap smear screening (presence of ASCUS or intraepithelial lesions) or speculoscopy (presence of aceto-whitening), subsequently underwent colposcopy. A total of 9.9% of participants (n=68) had normal results of Pap smear screening but a positive speculoscopy. This group represents the potential incremental yield of adding speculoscopy to routine screening. The colposcopy in this group showed a high-grade lesion in 3 women, low-grade lesions in 28 women and normal findings in 37 women. The clinical significance of low-grade lesions is uncertain; it is thought that the majority may be related to benign HPV infections or are otherwise self-limited.

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~~Therefore, a clearly clinically significant finding of a high-grade lesion was identified by speculoscopy alone in 3 of the 689 participants (0.4%). The clinical significance of this increase is unclear, particularly in the context of an increase in the false positive rate for referral to colposcopy (from 2.6% to 5.4%).~~

~~Wertlake and colleagues reported on the results of a larger trial of 5692 women who received speculoscopy in addition to routine pelvic exam and Pap smear screening (Wertlake, 1997). Pap smears showing intraepithelial lesions were considered positive, and speculoscopy was considered positive if aceto-whitening was present (note that unlike the above study, this study did not consider ASCUS cells to constitute a positive Pap smear). A total of 839 subjects with positive results on either test were referred for colposcopy. Of these, 648 (77%) were referred solely on the basis of speculoscopy results. Of the 839 referred for colposcopy, only 410 (51.3%) underwent the recommended colposcopy; of these 410 subjects, 333 were identified only by speculoscopy. Among these 333 women, 11 high-grade lesions were identified, while 154 had low-grade lesions, and 168 were interpreted as normal or reparative. Interpretation of these results is limited by the large number of drop-outs in the study, but the results are similar to the above study; a marginal increase in the identification of high grade lesions coupled with an increase in the false positive rate for referral to colposcopy. Another similarly designed, prospective community based study conducted in Italy reported similar results (Louidice, 1998). In this study of 3300 women, an additional 407 women were referred to colposcopy on the basis of a positive speculoscopy alone. Of these, 6 high-grade lesions were found; 269 had normal colposcopies and 132 low-grade lesions were found.~~

~~Consistent among all these studies is the increased detection of low-grade lesions by speculoscopy alone. Wertlake and colleagues (1997) noted:~~

> ~~The use of any of these visual aids [speculoscopy, cervicography, colposcopy] will require sound clinical algorithms for managing those patients with visual abnormalities only (Papanicolaou smear negative). Such algorithms are likely to be multifactorial, balancing the increase in disease detection with the potential for false-positive results…~~

~~*Speculoscopy as a Technique to Triage for Colposcopy*~~
~~Speculoscopy has also been proposed as a triage test for colposcopy for women with atypical Pap smears. The American Society of Colposcopy and Cervical Cytology Pathology has suggested various management options, including repeat cytology, HPV DNA testing or colposcopy for the following groups (Wright, 2002):~~

- ~~Women with ASCUS~~

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- Women with low grade squamous intraepithelial lesions (LSIL) in low risk, postmenopausal women with a history of negative screening
- Adolescents with LSIL

Massad and colleagues reported on a multicenter study of 137 with atypical Pap smears who underwent colposcopy (Massad, 1993). The exact nature of the atypia was not provided. Participants underwent Pap smear, followed by speculoscopy and then colposcopy. Any aceto-whitening areas noted on the speculoscopy exam were considered positive. Of the 94 women who had positive colposcopies, 73% and 27% had positive and negative speculoscopies, respectively. Using colposcopy as the gold standard, the sensitivity, specificity and positive and negative predictive value for speculoscopy was 73%, 93%, 96% and 62%, respectively. It is unclear how, based on this diagnostic performance, speculoscopy would be integrated into a program of cervical cancer screening. It is likely that a negative predictive value of 62% would be found adequate to consider foregoing a colposcopy, and it is unclear how the positive predictive value of 96% would affect the decision to undergo colposcopy. The results are not compared with the alternative options of repeat cytology or HPV testing.

In a second study from the same group of investigators, 395 participants referred for colposcopy underwent a repeat cervical smear followed immediately by a colposcopy, performed by the same physician (Lonky, 1995). Histologic diagnoses were compared with cytology, speculoscopy and colposcopy results. An antecedent aceto-whitening abnormality detected during speculoscopy was highly predictive (97% positive predictive value) of a subsequent abnormal colposcopy. This study suffers from the same limitations as the study described in the preceding paragraph.

Optical Detection Systems

On March 16, 2006 the U.S. Food and Drug Administration (FDA) granted pre-market approval (PMA) for the first optical detection system, the Luma™ Cervical Imaging System, for use as an adjunct to colposcopy for the identification of pre-cancerous and cancerous cervical lesions. The available data regarding this system is limited to a single study of 604 women undergoing colposcopy for evaluation of suspicious cervical lesions (Huh, 2004). The study involved the comparison of colposcopy results with those from the Luma Cervical Imaging System and histological findings. The authors reported 90% sensitivity for this method, stating that the use of the Luma device is predicted to identify 33% more high-grade CIN grade 2-3 lesions compared to colposcopy alone. While the results of this single study are promising, further evidence is needed to make an effective assessment of the utility

of this device in clinical practice and on long-term clinical outcomes. In 2010, a post-market clinical trial of the Luma device was terminated due to withdrawal of the FDA PMA for the device; reason for withdrawal is not cited.

In 2014, a systematic review was conducted by Adelman with the objective of describing novel innovations and techniques for detecting high-grade cervical dysplasia. The inclusion criteria for published articles were (1) studies investigating noncolposcopic evaluation of the cervix for the detection of cervical dysplasia, (2) original research conducted within the past 10 years, (3) ability to calculate sensitivity and specificity from the data presented, and (4) available in the English language. A total of 32 articles met the inclusion criteria and were reviewed by the single author of the study. The author concluded:

> If a device is to eventually replace the colposcope, it will likely combine technologies to best meet the needs of the target population. ~~-~~As such, no single instrument may prove to be universally appropriate. ~~-~~None of the modalities discussed in this review are currently in a position to replace standard colposcopy…

In a 2018 systematic review and meta-analysis Yang and colleagues reported on nine studies which evaluated the accuracy of an optical detection system for cervical screening. The nine studies encompassed 2730 participants. Pooled sensitivity was found to be 76% (95% confidence interval [CI], 73-80%) and pooled specificity was 69% (95% CI, 67-71%). The analysis did not include the performance of an optical detection system for CIN II or higher. All studies were conducted in advanced areas and hospitals. Data collected from rural areas may lead to different conclusions. The studies were conducted in China and findings could not be generalized to other populations.

None of the major authoritative organizations that address cervical cancer screening mention the use of ~~cervicography, speculoscopy, or~~ an optical detection system as part of a cervical cancer screening recommendations~~.~~ This includes the U.S. Preventive Services Task Force (USPSTF, 2018), the National Comprehensive Cancer Network (NCCN, 20~~1~~21~~9~~), the American College of Obstetrics and Gynecology (2018), the American Cancer Society (2018), and American Society for Colposcopy and Cervical Pathology (2012).

While the Luma system is no longer available in the United States, other optical detection systems are currently being studied and have been approved for use in Europe and Asia.

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Medical Policy

Optical Detection~~Imaging Techniques~~ for Screening and Identification of Cervical Cancer

Background/Overview

According to the American Cancer ~~s~~Society, in 20202019 there were approximately 13,800170 new cases of cervical cancer diagnosed in the United States and approximately 4290~~5~~0 deaths from the disease. Factors that increase the risk of developing cervical cancer include presence of the human papilloma virus (HPV), advanced age, and sexual history. HPV is a sexually transmitted virus that has been identified as the cause of the vast majority of cervical cancers. The more partners a woman has had, the more likely she is to have been exposed to the virus. Women who regularly have cervical cancer screenings through the Pap smear test have a reduced likelihood of mortality due to cervical cancer. This is due to early identification of abnormal cells that may lead to cervical cancer and by early detection of existing cervical cancer.

Cervical cancer develops through a gradual, progressive series of well-defined pre-cancerous lesions. In some early phases of the process these pre-cancerous lesions can revert back to healthy tissue. In other moderately advanced phases the lesions can persist for many years without progressing into cancer.

Screening and monitoring for cervical cancer is primarily done with Pap smear tests. This test is done by using a specialized brush and/or spatula to scrape cells from the surface of the cervix in order to view them under a microscope. Different phases of pre-cancerous and cancerous cells from the cervix look cytologically different from each other, allowing identification. If abnormal cells are found using a Pap smear test, the lesion with the abnormal cells can either be treated or monitored over time to prevent cervical cancer. Some lesions and cells are more difficult to identify than others. Under these circumstances additional work-up is required.

There are currently two methods for doing further evaluation of suspect or unidentified cells recommended by major medical societies. The first is to repeat the Pap smear test. The second is to test for HPV DNA. If such DNA is present, the likelihood that a lesion is pre-cancerous is greater than if it was not found.

At this time, the use of repeat Pap smears and detection of HPV DNA is considered the standard of care for follow-up investigation of unclear or suspect cervical lesions. Colposcopy, a technique that directly visually inspects the cervix following exposure to a mild acetic acid solution, is usually reserved for diagnosing the most difficult cases.

~~Cervicography has been proposed as another method for cervical cancer screening. This technique consists of the use of a specialized camera to take standardized images of the cervix after application of acetic acid. The device is described as easy to use and does not require experience in colposcopy. The photographs, referred to as "cervigrams", are static photographic images of the cervix similar to those seen during low-level magnification colposcopy. The images are sent to a central laboratory (National Testing Laboratories, the worldwide exclusive licensee of the product) for interpretation by colposcopists who have received specialized training in interpretation of cervigrams. Cervigrams are interpreted as negative, atypical, positive, or defective.~~

~~Cervicography has been investigated in three general settings:~~

- ~~As an alternative to Pap smear screening as a primary screening technique for cervical cancer. This application has been investigated primarily in "resource poor" areas that do not have cytology expertise to interpret Pap smears.~~
- ~~As an adjunct to routine Pap smear screening to improve the sensitivity of Pap smear screening for cervical cancer. For example, it is estimated that negative cytology reports are issued on 20% or more of all invasive cervical cancers.~~
- ~~As a triage technique for colposcopy in individuals found to have low-grade lesions on Pap smear specimens. The management of low-grade lesions (i.e., ASCUS), have been a subject of investigation. For example, colposcopy is an option for further work-up of ASCUS lesions, and yet at colposcopy only 20% of these women actually have a high-grade lesion. Furthermore, many low-grade lesions that may prompt colposcopy will spontaneously regress. If cervicography can be used to identify which ASCUS cytology results are most likely to harbor higher-grade lesions and thus need colposcopy and biopsy, unnecessary colposcopies in women with innocuous cytologic abnormalities would decrease.~~

~~Speculoscopy is another method proposed for cervical cancer screening. This method uses endoscopic visual examination of the cervix that uses specialized "blue-white" chemiluminescence along with acetic acid and low-power magnification. The cervix is washed with 3-5% acetic acid. A disposable blue-white chemiluminescent light is attached to the inner aspect of the upper speculum blade. The examining room lights are dimmed and the cervix is visually examined using 5X magnifying "loupes." Epithelial cells with increased keratinization and nuclear cytoplasmic ratios have an increased light reflection and appear white, in clear distinction to the dark blue of the normal epithelium. The presence of white lesions is considered a positive result; these areas may then be sampled for cytologic evaluation.~~

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~~Two clinical roles of speculoscopy have been proposed, both as an adjunct to conventional cervical cancer screening with Pap smears, and as a technique to select women with atypical Pap smears for further evaluation for colposcopy. For example, although cervical cancer screening is considered among the most successful cancer screening programs, it is still considered to be relatively insensitive; Pap smear cytology is associated with false negative results ranging from 15% to 55%. Speculoscopy is thought to potentially increase the sensitivity of cervical cancer screening by enhancing the visual inspection of the cervix.~~

Another proposed method is optical detection which

~~The Luma Cervical Imaging System~~ uses a specialized camera and light source connected to a computer to assess how different areas of the cervix respond to the light. The system uses an ~~proprietary~~ algorithm to process the cervical images and produce a color map of the cervix. This map indicates where the biopsy samples should be taken ~~doctor should take biopsy samples~~ to maximize the likelihood of catching suspect lesions. ~~It has been proposed that this technology improves the accuracy of diagnosis of cervical cancer and pre-cancerous conditions. This device is no longer available in the U.S.~~

Definitions

~~Cervicography: The use of photography to detect atypical cells or lesions on the surface of the cervix, following the application of an acetic acid solution. A special camera called a cerviscope is used to take a photograph of the cervix. The photograph is then magnified up to 16 times and is reviewed and interpreted by specially trained evaluators.~~

Cervix: The opening of the uterus.

Dysplasia: Abnormal growth and potentially premalignant changes of squamous cells; also known as intraepithelial neoplasia.

Optical detection systems: Computerized image analysis systems that use specialized cameras and light sources to assess how different areas of the cervix respond to the light to aid in biopsy direction. ~~(For example, Luma Cervical Imaging system).~~

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Papanicolaou (Pap) smear test: Involves examining a sample of cells from the cervix for evidence of malignancy and pre-cancerous changes.

~~Speculoscopy: A medical procedure that involves the use of a fiberoptic magnifying video camera to evaluate the appearance of the cervix following washing with an acetic acid solution.~~

Coding

The following codes for treatments and procedures applicable to this document are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

When services are Investigational and Not Medically Necessary:
When the code describes a procedure indicated in the Position Statement section as investigational and not medically necessary.

CPT

58999	Unlisted procedure, female genital system (nonobstetrical) [when specified as cancer screening or identification ~~speculoscopy including sampling, cervicography, or the use of~~using an optical detection systems~~]~~

ICD-10 Diagnosis

All diagnoses

References

Peer Reviewed Publications:

1. Adelman MR. Novel advancements in colposcopy: historical perspectives and a systematic review of future developments. J Low Genit Tract Dis. 2014; 18(3):246-260.
2. ~~Autier P, Coibion M, De Sutter P, Wayemberg M. Cytology alone versus cytology and cervicography for cervical cancer screening: a randomized study. Obstet Gynecol. 1999; 93(3):353-358.~~

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3. Costa S, Sideri M, Bucchi L, et al. Cervicography and HPV DNA testing as triage criteria for patients with abnormal pap smears. Gynecol Oncol. 1998; 71(3):404-409.
4. Costa S, Sideri M, Syrjanen K, et al. Combined Pap smear, cervicography and HPV DNA testing in the detection of cervical intraepithelial neoplasia and cancer. Acta Cytol. 2000; 44(3):310-318.
5. Cronje HS, van Rensburg E, Cooreman BF, et al. Speculoscopy vs. the acetic acid test for cervical neoplasia. Int J Gynecol Obstet. 2000; 69(3):249-253.
6. Edwards G, Rutkowski C, Palmer C. Cervical cancer screening with Papanicolaou smear plus speculoscopy by nurse practitioners in a health maintenance organization. J Lower Genital Tract Dis. 1997; 1(3):141-147.
7. Ferris DG, Schiffman M, Litaker MS. Cervicography for triage of women with mildly abnormal cervical cytology results. Am J Obstet Gynecol. 2001; 185(4):939-943.
8. Huh WK, Cestero RM, Garcia FA, et al. Optical detection of high-grade cervical intraepithelial neoclassic in vivo: results of a 604-patient study. Am J Obstet Gynecol. 2004; 190(5):1249-1257.
9. Loiudice L, Abbiati R, Boselli F, et al. Improvement of Pap smear sensitivity using a visual adjunctive procedure; a co-operative Italian study on speculoscopy (GISPE). Eur J Cancer Prev. 1998; 7(4):295-304.
10. Lonky NM, Mann WJ, Massad LS, et al. Ability of visual tests to predict underlying cervical neoplasia. Colposcopy and speculoscopy. J Reprod Med. 1995; 40(7):530-536.
11. Massad LS, Lonky NM, Mutch DG, et al. Use of speculoscopy in the evaluation of women with atypical Papanicolaou smears. Improved cost effectiveness by selective colposcopy. J Reprod Med. 1993; 38(3):163-169.
12. Mould TA, Singer A, Mansell ME, Gallivan S. Cervicography to triage women with borderline or mild dyskaryotic cervical PAP smears. Eur J Gynaecol Oncol. 2000; 21(3):264-266.
13. Schiffman M, Solomon D. Findings to date from the ASCUS-LSIL Triage Study (ALTS). Arch Pathol Lab Med. 2003; 127(8):946-949.
14. Schlecht NF, Trevisan A, Baggio ML, et al. Lack of agreement between cervicography and cytology and the effect of human papillomavirus infection and viral load. J Low Genit Tract Dis. 2006; 10(4):229-237.
15.2. Schneider DL, Burke L, Wright TC, et al. Can cervicography be improved? An evaluation with arbitrated cervicography interpretations. Am J Obstet Gynecol. 2002; 187(1):15-23.
16. Schneider DL, Herrero R, Bratti C, et al. Cervicography screening for cervical cancer among 8460 women in a high-risk population. Am J Obstet Gynecol. 1999; 180(2 Pt 1):290-298.
17. Singhakum N, Laiwejpithaya S, Chaopotong P. Digital cervicography by simply portable device as an alternative test for cervical cancer screening in rural area of Thailand. Asian Pac J Cancer Prev. 2018; 19(4):1145-1149.

18. Solomon D, Schiffman M, Tarone R. Comparison of three management strategies for patients with atypical squamous cells of undetermined significance: baseline results from a randomized trial. J Natl Cancer Inst. 2001; 93(4):293-299.
19. Spitzer M. Cervical screening adjuncts: recent advances. Am J Obstet Gynecol. 1998; 179(2):544-556.
20. Twu NF, Chen YJ, Wang PH, et al. Improved cervical cancer screening in premenopausal women by combination of Pap smear and speculoscopy. Eur J Obstet Gynecol Reprod Biol. 2007; 133(1):114-118.
21. Wertlake PT, Francus K, Newkirk GR, Parham GP. Effectiveness of the Papanicolaou smear and speculoscopy as compared with the Papanicolaou smear alone: A community based clinical trial. Obstet Gynecol. 1997; 90:421-427.
3. Wright TC Jr, Denny L, Kuhn L, Goldie S. Use of visual screening methods for cervical cancer screening. Obstet Gynecol Clin North Am. 2002; 29(4):701-734.
22.4. Yang H, Zhang X, Hao Z. The diagnostic accuracy of a real-time optoelectronic device in cervical cancer screening: A PRISMA-compliant systematic review and meta-analysis. Medicine (Baltimore). 2018; 97(29):e11439.

Government Agency, Medical Society, and Other Authoritative Publications:

1. American College of Obstetricians and Gynecologists. Practice Bulletin Number. 168: Cervical Cancer Screening and Prevention. Obstet Gynecol. 2016; 128(4):e111-e130. Reaffirmed 2018.
2. Centers for Medicare and Medicaid Services (CMS). National Coverage Determination: Screening pap smears and pelvic examinations for early detection of cervical or vaginal cancer. NCD #210.2. Effective June 19, 2006. Available at: http://www.cms.hhs.gov/mcd/index_list.asp?list_type=ncd. Accessed on November 54, 202019.
3. NCCN Clinical Practice Guidelines in Oncology™ (NCCN). © 202119 National Comprehensive Cancer Network, Inc. For additional information visit the NCCN website at: http://www.nccn.org/index.asp. Accessed on November 45, 202019.
    - Cervical Cancer (V.15.202119). Revised October 2, 2020September 16, 2019.
4. Saslow D, Solomon D, Lawson HW, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. CA Cancer J Clin. 2012; 62(3):147-172.
5. U.S. Preventive Services Task Force. Screening for cervical cancer. August 2018. Available at: https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/cervical-cancer-screeninghttps://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening2. Accessed on November 45, 202019.

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Websites for Additional Information

1. American Cancer Society (ACS). Cervical Cancer Prevention and Early Detection Guidelines. Updated July 30, 2020~~December 28, 2018~~. Available at: http://www.cancer.org/cancer/cervicalcancer/moreinformation/cervicalcancerpreventionandearlydetection/cervical-cancer-prevention-and-early-detection-cervical-cancer-screening-guidelines. Accessed on November 5~~4~~, 2020~~19~~.
2. American Cancer Society (ACS). Cervical cancer. Available at: https://www.cancer.org/cancer/cervical-cancer.html. Accessed on November 4~~5~~, 2020~~19~~.
3. Centers for Disease Control and Prevention (CDC). Cervical cancer. Updated on August 31~~19j~~, 2020~~19~~. Available at: http://www.cdc.gov/cancer/cervical/. Accessed on November ~~4~~5, 2020~~19~~.
4. National Cancer Institute (NCI):
   - Cervical Cancer Home Page: Available at: https://www.cancer.gov/types/cervical/hp. Accessed on November ~~4~~5, 2020~~19~~.
   - Cervical Cancer Screening (PDQ®). Updated on August 12, 2020~~October 16, 2019~~. Available at: https://www.cancer.gov/types/cervical/hp/cervical-screening-pdq. Accessed on November ~~4~~5, 2020~~19~~.
   - Cervical Cancer Treatment (PDQ®). Updated on May 13, 2020~~February 6, 2019~~. Available at: https://www.cancer.gov/types/cervical/hp/cervical-treatment-pdq. Accessed on November ~~4~~5, 2020~~19~~.

Index

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Medical Policy

Optical Detection~~Imaging Techniques~~ for Screening and Identification of Cervical Cancer

The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

Document History

Status	Date	Action
Revised	02/11/2021	Medical Policy & Technology Assessment Committee (MPTAC) review. Title change to Optical Detection for Screening and Identification of Cervical Cancer. Removed cervicography and speculoscopy from the scope of the document. Updated Description/Scope, Position Statement, Rationale, Coding, Background/Overview, Definitions, References, and Index sections.
Reviewed	02/20/2020	~~Medical Policy & Technology Assessment Committee (~~MPTAC~~)~~ review. Updated Background/Overview and References sections.
Reviewed	03/21/2019	MPTAC review.
Reviewed	03/20/2019	Hematology/Oncology Subcommittee review. Updated Rationale, Background/Overview, References and Websites sections.
Reviewed	05/03/2018	MPTAC review.
Reviewed	05/02/2018	Hematology/Oncology Subcommittee review. The document header wording updated from "Current Effective Date" to "Publish Date." Updated Rationale, References and Websites sections.
Reviewed	05/04/2017	MPTAC review.
Reviewed	05/03/2017	Hematology/Oncology Subcommittee review. Updated Background/Overview and References sections.
Reviewed	05/05/2016	MPTAC review.
Reviewed	05/04/2016	Hematology/Oncology Subcommittee review. Updated Background and References sections. Removed ICD-9 codes from Coding section.
Reviewed	05/07/2015	MPTAC review
Reviewed	05/06/2015	Hematology/Oncology Subcommittee review. Updated Rationale, Background/Overview, Definitions and Reference Sections.
Reviewed	05/15/2014	MPTAC review.
Reviewed	05/14/2014	Hematology/Oncology Subcommittee review. Updated References section.
Reviewed	05/09/2013	MPTAC review.

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Reviewed	05/08/2013	Hematology/Oncology Subcommittee review. Updated References section.
Reviewed	05/10/2012	MPTAC review.
Reviewed	05/09/2012	Hematology/Oncology Subcommittee review. Updated References section.
Reviewed	05/19/2011	MPTAC review.
Reviewed	05/18/2011	Hematology/Oncology Subcommittee review. Updated References section.
Reviewed	05/13/2010	MPTAC review.
Reviewed	05/12/2010	Hematology/Oncology Subcommittee review. Updated References section.
Reviewed	05/21/2009	MPTAC review.
Reviewed	05/20/2009	Hematology/Oncology Subcommittee review. Updated References section.
	01/01/2009	Updated Coding section with 01/01/2009 CPT changes; removed CPT 0031T, 0032T deleted 12/31/2008.
Reviewed	05/15/2008	Medical Policy & Technology Assessment Committee (MPTAC) review.
Reviewed	05/14/2008	Hematology/Oncology Subcommittee review. Updated Rationale and References sections.
	02/21/2008	The phrase "investigational/not medically necessary" was clarified to read "investigational and not medically necessary." This change was approved at the November 29, 2007 MPTAC meeting.
Reviewed	05/17/2007	MPTAC review.
Reviewed	05/16/2007	Hematology/Oncology Subcommittee review. Coding updated; removed CPT 0003T deleted 12/31/2006.
Revised	06/08/2006	MPTAC revision. Title changed from “Cervicography and Speculoscopy” to “Imaging techniques for Screening and Identification of Cervical Cancer”. Added the Luma™ Cervical Imaging System as Investigational/Not Medically Necessary. Updated Rationale, Background/Overview, Definitions and References sections. Document number changed from RAD.00005 to MED.00087.
Revised	07/14/2005	MPTAC review. Revision based on Pre-merger Anthem and Pre-merger WellPoint Harmonization.

Pre-Merger Organizations	**Last Review Date**	**Document Number**	**Title**
Anthem, Inc.	06/16/2003	RAD.00005	Cervicography and Speculoscopy

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WellPoint Health Networks, Inc.	04/28/2005	2.09.14	Cervicography
	04/28/2005	2.09.15	Speculoscopy

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