ASCP PATIENT CHAMPIONS

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LABORATORY TESTS RELATED TO CERVICAL DISEASES AND CANCER

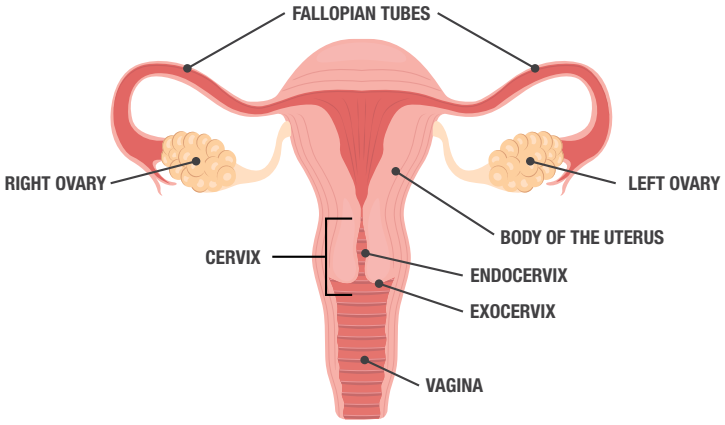
WHAT IS THE CERVIX?

The cervix is located in the lower part of a women's uterus.

The cervix is typically about two inches long, it is shaped like a tube, and connects the uterus to the vagina. The cervix has two separate parts, each with its own type of cells. The endocervix is the opening of the cervix and it leads into the uterus. The walls of this part of the cervix are covered with glandular cells. These cells are involved in a woman's menstrual cycle and they produce cervical mucus.

The ectocervix is the outer part of the cervix and it is covered in non-keratinized squamous cells, which form the surface of hollow organs of the body such as the inside of your mouth or nose.

All women can be at risk for cervical disease and cervical cancer, but through regular screening with a healthcare provider, cervical disease and cancer are preventable.



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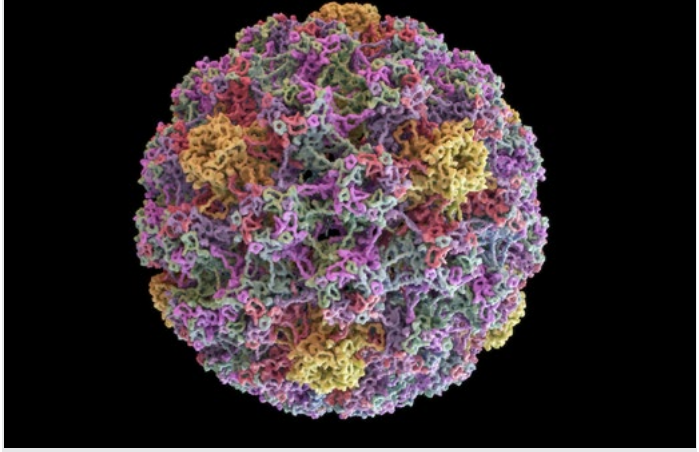
CERVICAL DISEASES

Cervical diseases include cervicitis (inflammation of the cervix), cervical polyps, cysts, condylomas (benign warts), low risk diseases associated with low risk human papillomaviruses (HPV), and low grade squamous intraepithelial lesions (SIL). Additional diseases are precancerous high grade SIL (associated with high grade HPV), squamous cell carcinomas (malignant), endocervical adenocarcinoma (malignant) as well as other rare malignancies. Because cervical conditions rarely have symptoms in the early stages, laboratory testing at appropriate intervals is especially important to detect issues.



CERVICAL CANCER

Cervical cancer is a malignant tumor that is located in the cervix. The transformation zone between the endocervix and the ectocervix changes as you get older and if you give birth. The transformation zone is where the two types of cells, glandular and squamous cells, meet. Most cervical cancers start in this area.

The most common types of cervical cancers are squamous cell carcinoma (SCC) and Adenocarcinoma (ADC). Less common, but also possible, is a combination of SCC and ADC. SCC typically begins in the transformation zone and develops from cells in the exocervix. ADC typically develops in the endocervix from glandular cells.

STAGES OF CERVICAL CANCER

The stages of cervical cancer determine how far the cancer has spread and what parts of the body it has spread to. Your treatment plan and prognosis will depend on the staging portion of your diagnosis. Below is a short description of each stage:

- **STAGE 0:** Pre-cancerous cells (carcinoma in situ) are only found in the innermost lining of the cervix. It is important to note that this is not malignant and, if diagnosed during this stage, completely curable. Other synonyms include high-grade squamous intraepithelial lesion, and Cervical Intraepithelial Neoplasia (CIN) III.
- **STAGE I:** The cancer has invaded the cervix and possibly the uterus.
- **STAGE II:** The cancer has spread beyond the uterus, but not to the lower part of the vagina or the pelvis.
- **STAGE III:** The cancer has spread to the lower part of the vagina and the pelvis, but not to other parts of the body or lymph nodes.
- **STAGE IV:** The cancer has spread to other part of the body; the cancer has metastasized.

CERVICAL CANCER AND HPV

Human Papillomavirus (HPV) is the main cause of cervical cancer, in particular, specific types of HPV such as HPV16 and HPV18. There are over 118 different HPV types that can infect humans with about 40 of those affecting the genital area. Among those, the 14 most carcinogenic (meaning cancer causing) types are classified as high risk HPV types (HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68*). More specifically, HPV16 and HPV 18 cause the majority (~70%) of Squamous Cell Carcinomas and HPV16, 18, and 45 are associated with ~95% of Adenocarcinomas.

HPV is the most common sexually transmitted disease (STD). A vaccine that prevents HPV types is available and is recommended for both girls and boys during routine vaccination starting at age 11 or 12 years old**. The HPV vaccination prevents new HPV infections but does not treat existing HPV infections or diseases.

* https://www.mayocliniclabs.com/test-catalog/Clinical+and+Interpretive/62598

** https://www.cdc.gov/vaccines/vpd/hpv/hcp/recommendations.html

LABORATORY TESTS RELATED TO CERVICAL DISEASES AND CANCER SCREENING

The goal of cervical screening is to find cervical diseases, pre-cancer, or cancer early when it is more easily treatable. Regular screening can prevent cervical cancer and save lives. Screening is recommended for all women starting at age 21 through 65. The screening process involves your healthcare provider taking a sample of cells from the cervix during a pelvic examination. The types of tests that may be used include:

PAP TEST: This is the most common test used to detect cervical cancer and its precursors. This screening test is important because it can detect precancerous disease early even when physical symptoms are absent. Guidelines recommend that a Pap test is conducted every 3-5 years, unless there is an increase in risk of cervical cancer due to presence of high-risk HPV, previous abnormal Pap tests, or personal or family health history.

HUMAN PAPILLOMAVIRUS (HPV) TEST: This test screens for high-risk HPV virus but it does not detect if you have cervical cancer. A positive high-risk HPV test requires additional triage tests to determine whether a woman is at high enough risk to warrant further follow-up with colposcopy to establish the presence and extend of disease.

HPV + PAP COTEST: This test checks the same sample for both cellular cell changes and for high-risk HPV types. Cotesting increases the chances of finding abnormal cells, cervical disease, or predicting the severity of cervical disease.

WHAT HAPPENS IF I GET AN ABNORMAL TEST RESULT?

You may receive an abnormal test result from cervical screening tests. Your healthcare provider will work with you to determine appropriate next steps. Abnormal tests are common and do not automatically mean you have cervical disease or cancer. Sometimes you may need a follow-up procedure to assess if cervical disease or cancer is, in fact, present. These follow-up procedures may include:

COLPOSCOPY: This test identifies abnormalities by closely examining your cervix using an instrument that magnifies (40X) the surface of the cervix, vagina, and vulva. If there are abnormal lesions, a biopsy will be taken (see below). This test is usually conducted after an abnormal Pap or a high-risk HPV test result.

This test is not to be confused with a colonoscopy (test used to detect abnormalities in the large intestine or rectum).

COLPOSCOPIC BIOPSY: During a colposcopy, a small section of an abnormal area in the cervix may be removed. If so, these cells will be examined under a microscope in the laboratory. This biopsy comes from tissue within the endocervix.

ENDOCERVICAL CURETTAGE BIOPSY: This biopsy comes from tissue within the endocervix, which is located closer to the uterus. This type of biopsy is conducted when the colposcopic biopsy does not reveal any abnormal areas or if it is it not possible to see the transformation zone with a colposcope.

CONE BIOPSY: This biopsy involves the transformation zone, where cancerous cells are most likely to originate. This type of biopsy can also be used as a treatment to remove early pre-cancers or stage 1 cervical cancer.

ASK YOUR DOCTOR

- What is the course of action based on my lab results?
- How will the lab test results impact my treatment plan?
- What are all my treatment options?
- Why do you recommend this particular treatment option?
- What tests are used for my cervical screening?
- How do we know the procedure was successful/what lab tests and which results indicate a successful procedure?
- If malignant, what are the tumor markers we are monitoring? What are the levels we are considering?
- What happens if the tumor markers are higher than we would like to see?
- What are the follow-up tests and what are their importance?

UNDER THE MICROSCOPE

This is a pathology image of a cervical cancer Pap test. The long slender snake-like cells have abnormal DNA and are interspersed amongst tissue necrosis (dead tissue). These cellular elements are indicative of cervical cancer, also known as squamous cell carcinoma.