

Practice Point

PAP Smear: Screening Test that Saves Life

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Cervical cancer continues to be one of the most common cancers all over the world among females, being the fourth in order after breast, colorectal, and lung cancer¹. Worldwide, annually there are approximately 604,000 new cases of cervical cancer, with about 342,000 deaths². Most new cases and deaths (approximately 85% and 90%, respectively) occur in low- and middle-income countries (LMICs), where it is the third most common cancer among women^{2,3,4}. In India, it is the most common gynaecological cancer and the cause of pyometra and postmenopausal bleeding.

Cervical cancer is a preventable disease due to the long pre-invasive stage^{4,5,6}. Early detection and appropriate treatment are possible if robust screening is implemented. Early cervical epithelial changes can be identified by a Pap smear test, which is the primary screening test for detection of precancerous cervical intraepithelial neoplasia (CIN) and the early stage of invasive cervical cancer⁷. Pap smear testing is a very useful, simple, economical, and safe tool for detecting precancerous cervical epithelial lesions⁷.

The WHO has called for a global initiative for the elimination of cervical cancer as a public health problem by implementing the 90%70%90% triple pillar intervention strategy before the year 2030^{2,6}:

- 90% of girls are fully vaccinated with two doses of HPV vaccine by the age of 15 years.
- 70% of women screened using a high-performance screening test at the age of 35 and 45 years; and
- 90% of women are detected with cervical lesions to receive treatment and care.

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SCREENING: It aims at early diagnosis and treatment of prevalent precancerous lesions such as CIN and adenocarcinoma in situ. Several screening strategies have been used effectively in varied settings:

1. Conventional cytology (Pap smear)
2. Liquid-based cytology (LBC) and HPV testing (advanced settings)
3. Visual inspection with acetic acid (VIA) and Lugol's iodine (VILLI) in low-resource settings

PAP SMEAR: (synonyms -exfoliative cytology or surface biopsy).

This test was described by Papanicolaou and Traut in 1943. It is a screening test to detect cervical cancer which involves collecting the exfoliated cells from the cervix. It forms a part of the routine gynaecological examination of women. Aside from premalignant and malignant changes, other local conditions and hormonal changes can often be recognised by cytologists. Pap test has been regarded as the gold standard of cervical screening programs. When the Pap test is combined with an HPV DNA test, the sensitivity for detection of cervical pathology is increased⁶.

WHEN TO DO THE TEST

1. All sexually active women older than 21 years should undergo an annual check-up with 3 yearly Pap tests.
2. 3 years after the onset of sexual intercourse.
3. Up to the age of 65 years if they had 2 negative smears in the previous 10 years.

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PRE-REQUISITES

- The patient should not have intercourse or vaginal medicine or douching 24 hours before the test.
- The best time to do a test is around ovulation.
- The Pap smear should be obtained before the vaginal examination as the finger may remove the dysplastic cells.
- Avoid the use of jelly or lubricant or betadine.
- An assistant for opening the sterile instruments set, gloves and focusing the light.

INSTRUMENTS AND MATERIAL:

1. Cusco's self-retaining speculum
2. Kit containing Arye's Spatula for the ectocervix and Endocervical brush for the endocervix (Figure 1).
3. Fixative.
4. Jar.
5. Slides
6. Laboratory form.

Spatula and cytobrush

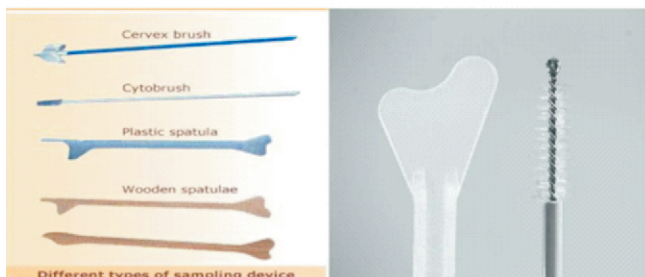


Fig. 1: Sampling devices for Pap smear (Courtesy Slide Share)

PROCEDURE

- Ask the patient to void.
- Provide privacy to undress and place the patient in a dorsal/lithotomy position.
- Encourage the patient to take deep breaths to help to relax the pelvic floor muscles.
- After separating the labia, Cusco's self-retaining speculum is gently introduced.
- The cervix is completely exposed, and inspection is done, then the squamocolumnar junction is scraped with Arye's spatula by rotating all around 3600. The

longer end of the spatula goes into the cervical canal and the shorter rests on the ectocervix (Figure 2)

- The endocervix sample is collected with an endocervical brush, inserted into the endocervical canal then rotated at 1800. The sample is rolled on the second slide.
- The scrapings are evenly spread onto glass slides and immediately fixed by dipping them in a jar containing 95% ethanol. Nowadays fixative sprays can be used.
- Observe any discharge from the cervix, and withdraw the speculum gently, vaginal examination can be done with aseptic precautions.
- Documentation is done and the specimen is sent to the laboratory with the form.

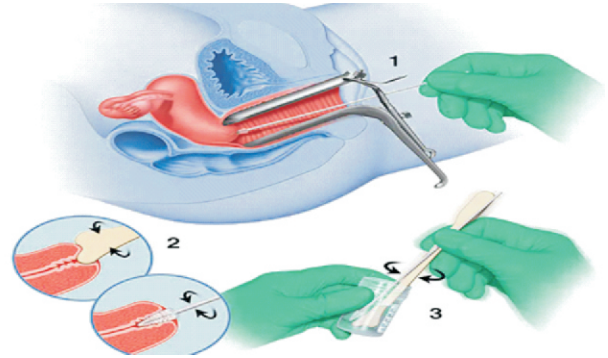


Fig. 2: Method of taking a Pap smear. (Courtesy- Google Images)

RESULTS

A Pap smear can alert the doctor to the presence of suspicious cells that need further testing. It can detect about 60-70% of pre-cancer and cancer of the cervix. The reliability of the report depends on the slide preparation and the skill of the cytologist. A false-positive reading is reported in the presence of infection which can be reduced by repeated tests.

NORMAL SMEAR

Three types of cells are found in normal smear:

1. The basal and parabasal cells are small, rounded, and basophilic with large nuclei.
2. The cells from the middle layer are squamous cells, transparent and basophilic with vesicular nuclei.
3. The cells from the superficial layer are acidophilic with characteristic pyknotic nuclei. In addition, endometrial,

histiocytes, blood cells and bacteria can be seen.

ABNORMAL SMEAR

Malignant cells are hyperchromatic, have an increase in chromatin material, and nuclei vary in size. A high nucleus/cytoplasmic ratio is seen.

CLASSIFICATIONS FOR INTERPRETATION OF PAPSMEAR

Table 1: Papanicolaou Classification

CLASS	CYTOLOGY
I. Normal	Absence of abnormal or atypical cells
II. Normal/Atypical	Atypical cells but no evidence of malignancy
III. Suspicious	Undefined- suggestive of but not conclusive for malignancy
IV. Suggestive	Strongly suggestive of malignancy
V. Indicative	Conclusive for malignancy

Table 2. Classification System For Cervical Cytology.

WHO	CIN	Bethesda
Negative for cancer	Negative	Within normal limits
Atypical squamous cells	Negative Atypical cells HPV atypia	Infection Reactive/reparative changes Atypical squamous cells of undetermined significance (ASCUS) or Atypical glandular cells of undetermined significance (AGCUS)
Mild dysplasia		Low grade squamous intraepithelial lesion (LSIL)
Moderate dysplasia		High grade squamous intraepithelial lesion (HSIL)
Severe Dysplasia Carcinoma in situ		High grade squamous intraepithelial lesion (HSIL)
Invasive Carcinoma		Invasive Carcinoma

Bethesda system^{8,9}:

Papanicolaou results were further improved upon by Ayre in 1951 and Richart in 1966, and a further attempt at unifying different terminologies was done in 1988 at Bethesda, Maryland. This came to be called The Bethesda system (TBS) which creates a standardized framework for laboratory reports that include a descriptive diagnosis and an evaluation of specimen adequacy. It stands out as a model of standardized reporting in cervicovaginal cytology.

1. ASC-US: It stands for atypical squamous cells of undetermined significance. This means that changes in the cervical cells have been found and are almost always a sign of an HPV infection. It is the most common abnormal Pap test result.
2. LSIL: stands for low-grade squamous intraepithelial lesion and means that the cervical cells show mildly abnormal changes. LSIL is usually caused by an HPV infection that often goes away on its own.
3. HSIL: stands for high-grade squamous intraepithelial lesion and suggests more serious changes in the cervix than LSIL.
4. ASC-H: stands for atypical squamous cells, cannot exclude HSIL and means that changes in the cervical cells have been found that raise concern for the presence of HSIL.
5. AGC: stands for atypical glandular cells and means that changes have been found in glandular cells that raise concern for the presence of precancer or cancer. Glandular cells make up the tissue that covers the inner canal of the cervix and are also present inside the uterus.

Take Home Message

1	Pap test should be established as a routine screening procedure to reduce the treatment burden, morbidity, and mortality.
2	Every woman above the age of 30 years should undergo routine cervical cancer screening, up to the postmenopausal period.
3	The community should be educated about the Pap smear test, including its goal and the required frequency of application, by widespread educational and media programs
4	Women with an abnormal Pap test should undergo a colposcopy, and those with abnormal colposcopy findings should be advised to undergo a biopsy.

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