Cervical Cancer and Structure of Cervix

Agenda

1. Introduction to cervical cancer

2. Structure of cervix

3. Common conditions of cervix

4. VIA (Visual Inspection with Acetic Acid) Examination
    - VIA Principle
    - VIA Equipment and Consumables
    - Preparation of 5% acetic acid

1 Introduction to cervical cancer

Cancer Burden in India

Common Cancers in India

	Incidence (ASR)	Mortality (ASR)
Women		
Breast	24.7	13.4
Cervix	**14.7**	**9.2**
Ovary	5.5	3.7
Man		
Lip. Oral cavity	13.9	7.7
Lung	7.8	7.3
Stomach	6.2	5.7

In India every year 96,922 women are diagnosed with cervical cancer and 60,078 women die of cervical cancer

ASR (Age- Standardized Rate) per 1,00,000

Source: Globocan 2018

Cervical Cancer

What is cervical cancer?

- Cervical cancer develops in the cervix of women
- Cells on the cervix grow abnormally and sometimes if left untreated can become cancerous
- Cervical cancer is caused by infection from high-risk types of human papillomavirus (HPV)
- HPV infects 80-90% of women in reproductive life

Why cervical cancer screening is important?

- In more than 80% of women the infection clears on its own within a year
- Only in few women that the infection persists and may lead to the development of Cervical Intraepithelial Neoplasia (CIN) or cervical cancer later in life
- Invasive cervical cancer is preceded by a long precancerous or intraepithelial stage of 15-20 years
- Pre-cancerous stage can be easily detected by simple screening techniques like VIA
- Treatment of pre-cancer lesion is very simple and effective

Risk Factors and Signs and Symptoms of Cervical Cancer

Risk Factors

- Marriage at young age or becoming sexually active at young age
- Multiple sexual partners
- Lack of hygiene in sexual organs
- Giving birth at young age (<17 years) or giving birth frequently
- Malnutrition, smoking or tobacco consumption
- Immunity supressing diseases like HIV- AIDS

Signs and Symptoms

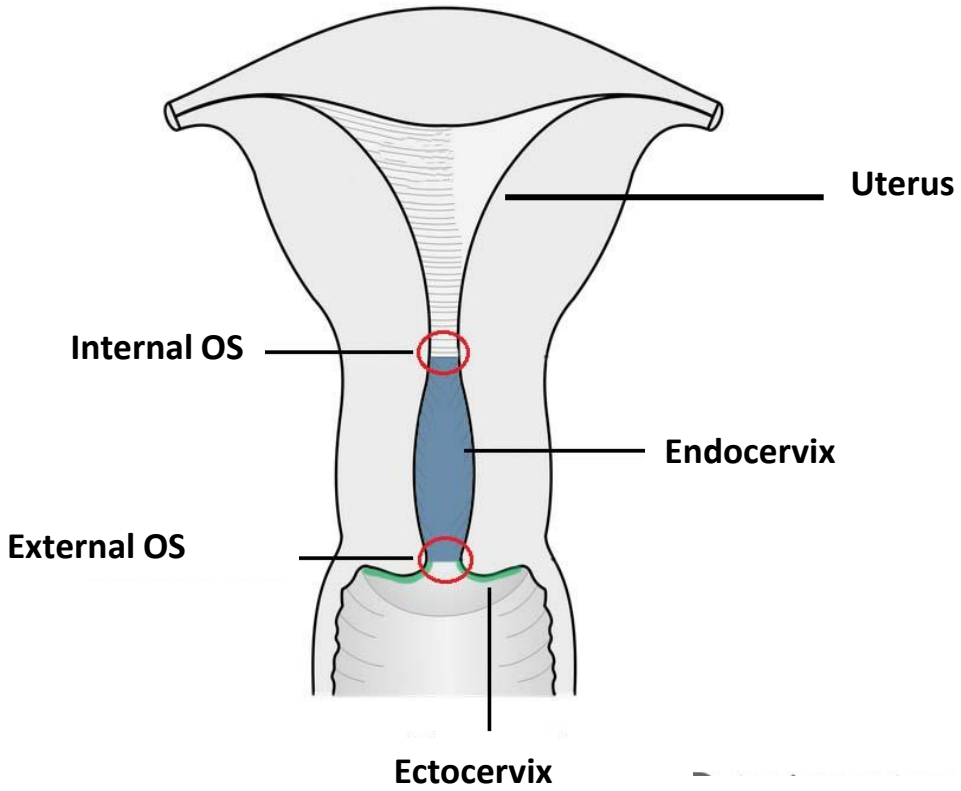
- Abnormal vaginal bleeding
- Post-menopausal bleeding
- Post-coital bleeding
- Foul smelling/excessive vaginal discharge
- Unusual vaginal discharge tinged with blood
- Dyspareunia – painful intercourse

In most women early stages of cervical pre-cancer can be symptomless, therefore it is important to screen all the women (symptomatic as well as asymptomatic) in the age group of **30-65 years**

During COVID-19, screening of symptomatic women identified through NCD CBAC listing should be prioritized

2 Structure of cervix

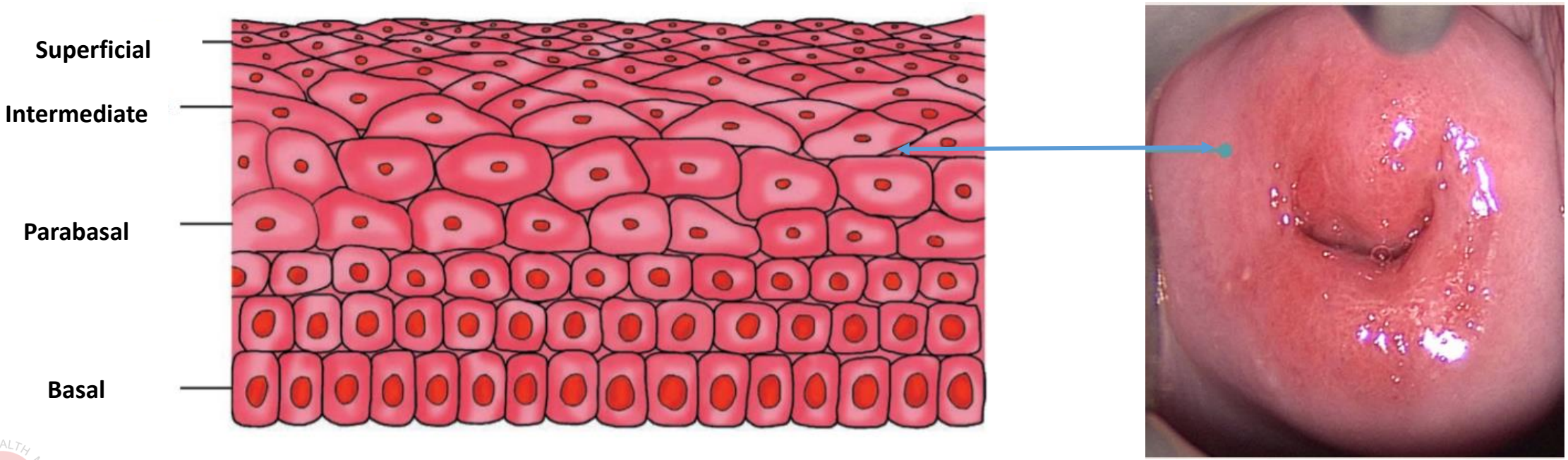
Structure of Cervix



- Cervix is the lower one third of the uterus, it measures 3–4 cm in length, and 2.5-3.5 cm in diameter
- It varies in size and shape depending on the **age**, **parity** and **hormonal status** of the woman
- Cervix is divided into two parts- **Ectocervix** and **Endocervix**
- Cervix opens into the vagina through the **external os**
- Portion of the cervix that is exterior to the external os is called the ectocervix
- Cervix opens into the uterus through the **internal os**
- **Endocervical canal** which traverses the endocervix, connects the uterine cavity with the vagina and extends from the **internal to the external os**

Ectocervix

- Portion of the cervix that is exterior to the external os is called the ectocervix, ectocervix is covered by the stratified, nonkeratinizing, glycogen-containing **squamous epithelium,** and appears **pale pink** in colour on visual examination
- Squamous epithelium is divided into 4 parts namely- basal, parabasal, intermediate and superficial layers from below upwards
- It is ectocervix that is readily visible on speculum examination

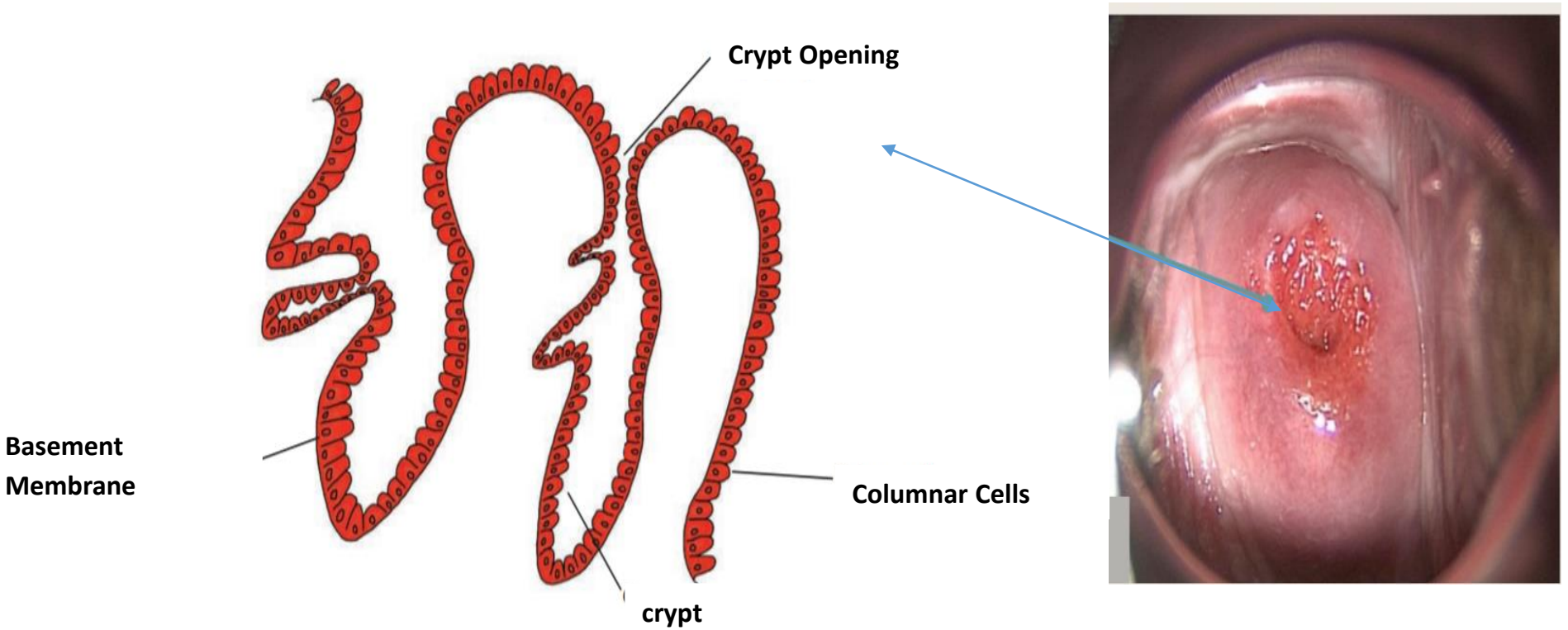


Ectocervix

Endocervix

- Portion of cervix above the external os is called the endocervix, it is lined by the columnar epithelium composing of a single layer of tall cells. Columnar cells secrete the mucus that lubricates the cervix and vagina

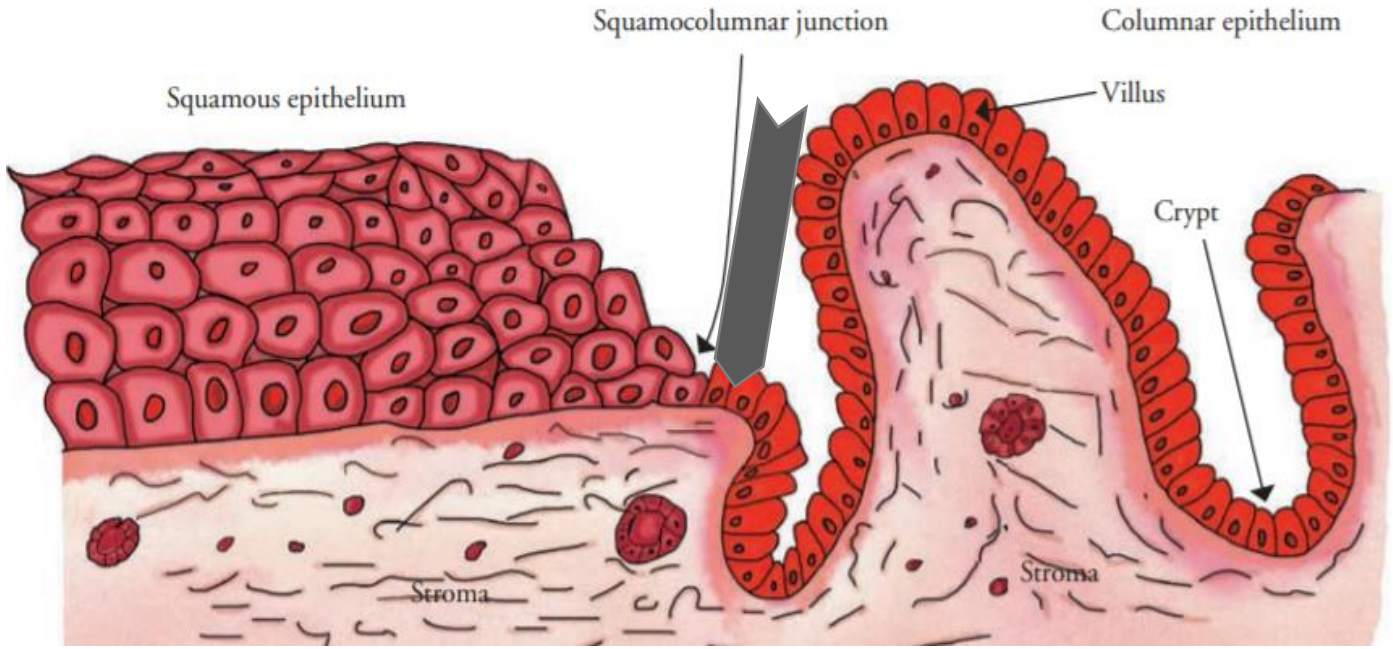
- On visual examination, columnar epithelium appears red in colour with a granular velvet like surface



Endocervix

Squamo-Columnar Junction (SCJ)

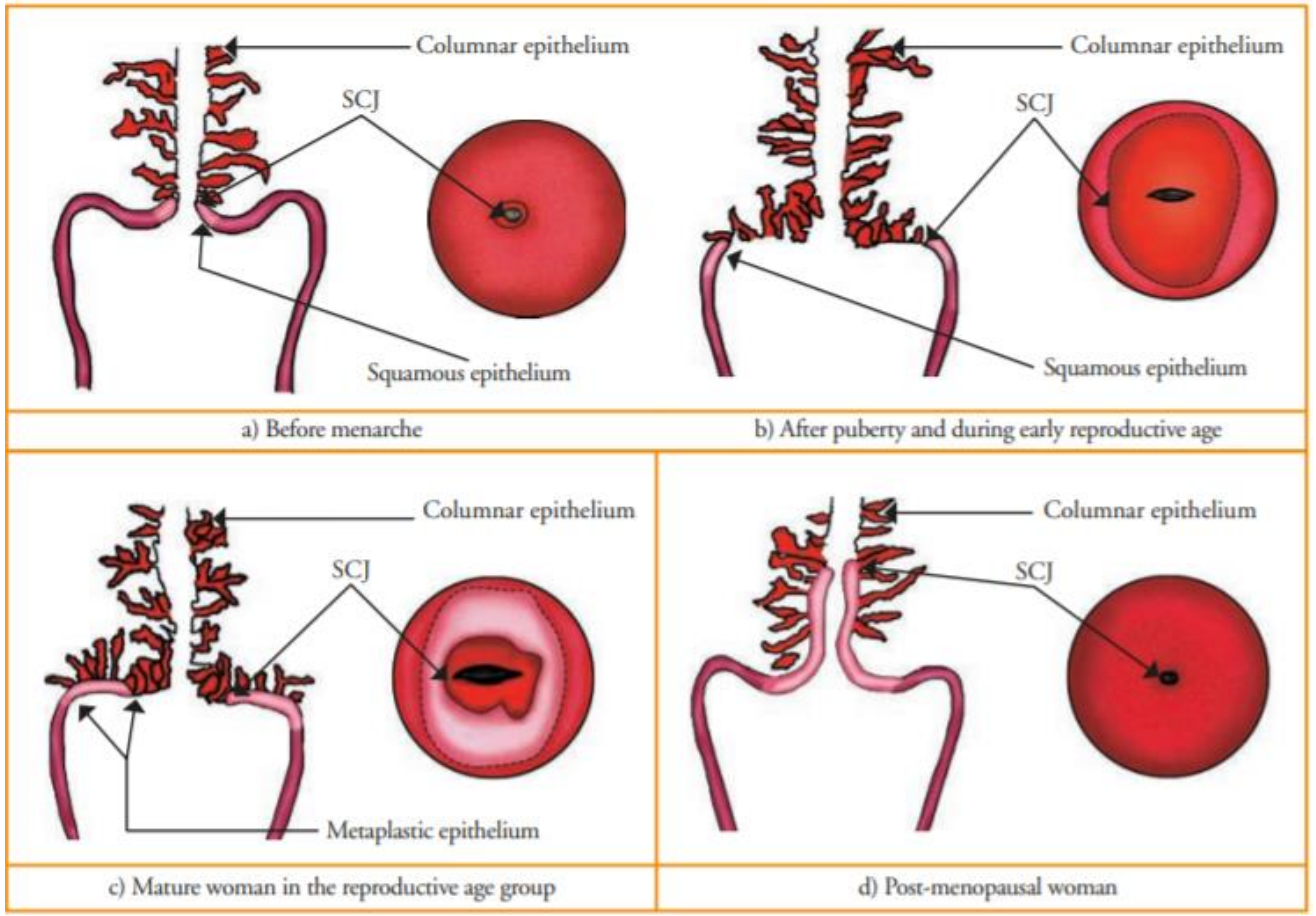
- **Columnar epithelium** at its lower limit meets the **squamous epithelium,** the junction between the two epithelia is known as the **squamocolumnar junction (SCJ)**
- SCJ is usually visible as a sharp border located near the external os
- Position of the SCJ in relation to the external os changes with **age**, **pregnancy, hormonal status (**oral contraceptive pills) and **menopause status**



Squamo-Columnar Junction (SCJ)

Squamo-Columnar Junction (SCJ)

- During childhood and peri menarche, it is located at, or very close to the external os
- After puberty and during the reproductive period, the uterus grows under the influence of oestrogen. As a result, the squamocolumnar junction is located in the ectocervix, far away from the external os
- During peri- and post-menopausal period, the cervix shrinks due to the waning effect of oestrogen. As a result the SCJ moves inside the endocervical canal



Changes in position of SCJ with Age

Ectopy

- From puberty and throughout reproductive life, the uterus grows under the influence of oestrogen
- This leads to the eversion of the columnar epithelium onto the ectocervix, particularly on the anterior and posterior lips, resulting in **ectropion or ectopy**
- On visual inspection, ectropion is seen as a strikingly reddish ectocervix

Ectopy

Squamous Metaplasia

- During Ectopy, columnar epithelium on the ectocervix becomes exposed to the acidic environment of the vagina
- This causes destruction of the columnar epithelium and its gradual replacement by the newly formed squamous epithelium
- This process through which the columnar epithelium on the ectocervix is gradually replaced with squamous epithelium is called squamous metaplasia
- Converted epithelium formed during this process is called **metaplastic squamous epithelium**

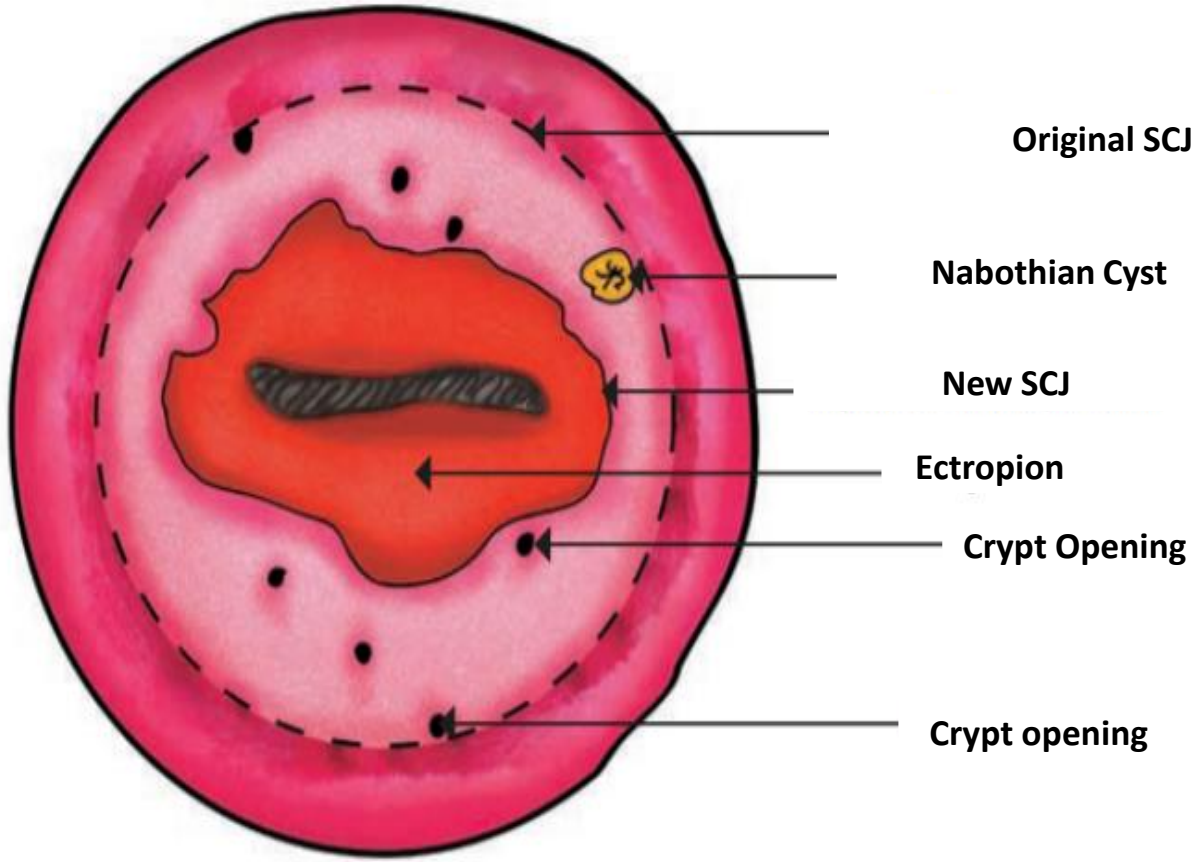
Squamous Metaplasia

Transformation Zone (TZ)

- SCJ formed between the metaplastic squamous epithelium and the columnar epithelium is known as the new SCJ
- Area between the original SCJ and the newly formed SCJ as a result of metaplasia is the transformation zone (TZ)
- Transformation zone (TZ) expand and shrink based on **age, parity, infection** and **hormone**
- More than 90% of pre-cancer lesions also known as cervical intraepithelial lesion(CIN) originate in the transformation zone

Transformation Zone (TZ)

Transformation Zone



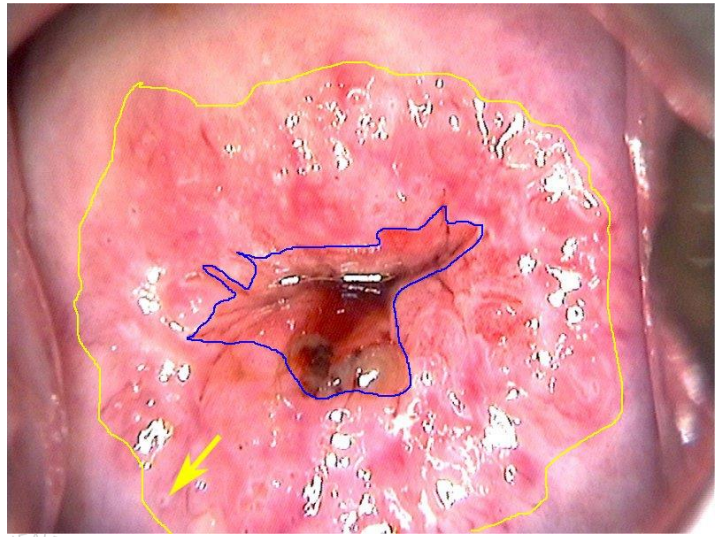
Types of Transformation Zone (TZ)

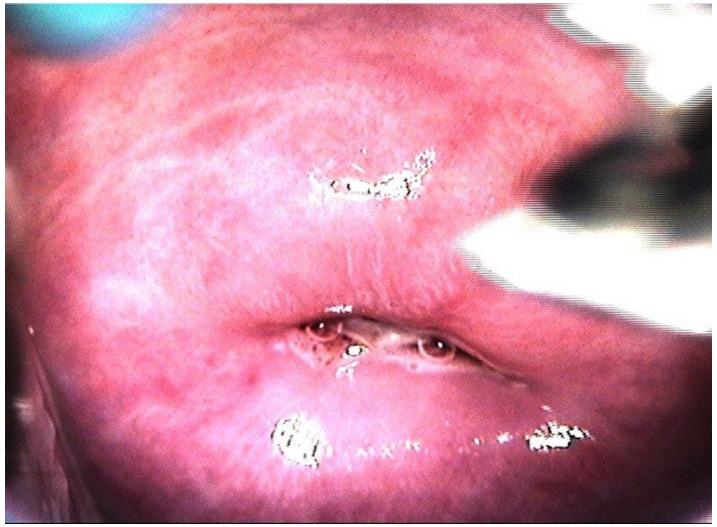
Depending on the location and the visibility of the SCJ, the transformation zone (TZ) is categorized into Type 1, Type 2, or Type 3

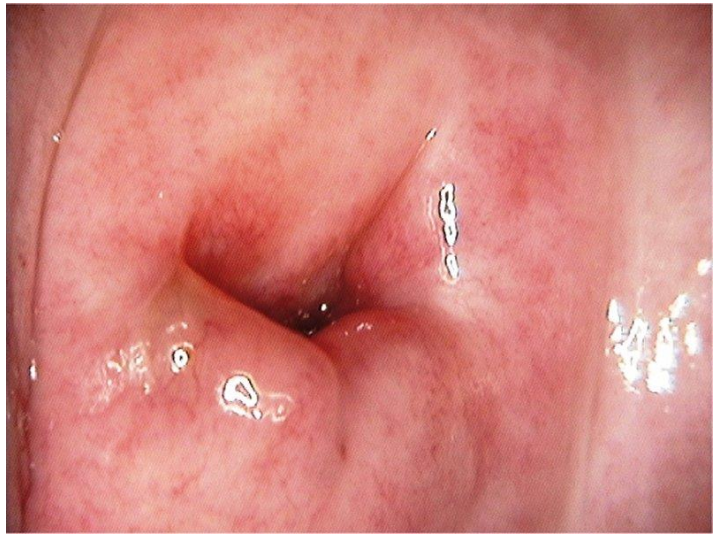
Type 1 TZ - SCJ is fully visible and is located fully on the ectocervix

Type 2 TZ - SCJ is fully visible (with or without an endocervical speculum) and is located either fully or partially within the endocervical canal

Type 3 TZ - SCJ is within the endocervical canal and is only partially visible or not at all visible, even using an endocervical speculum





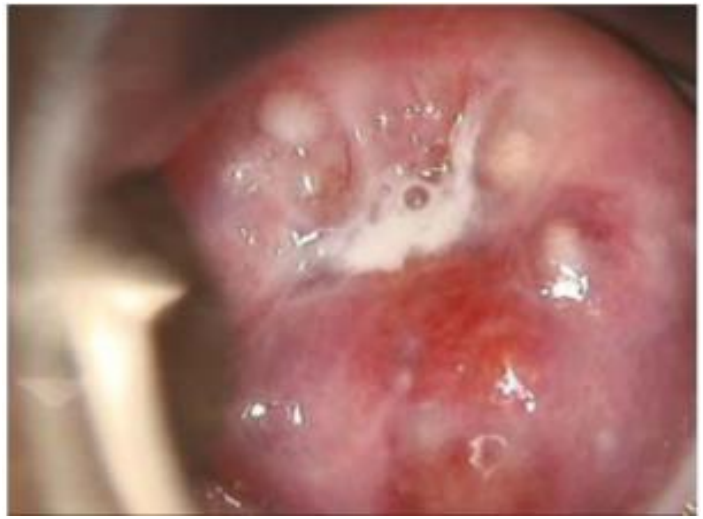


3 Common conditions of cervix

Physiological Changes in Cervical Epithelium

Postmenopausal cervix

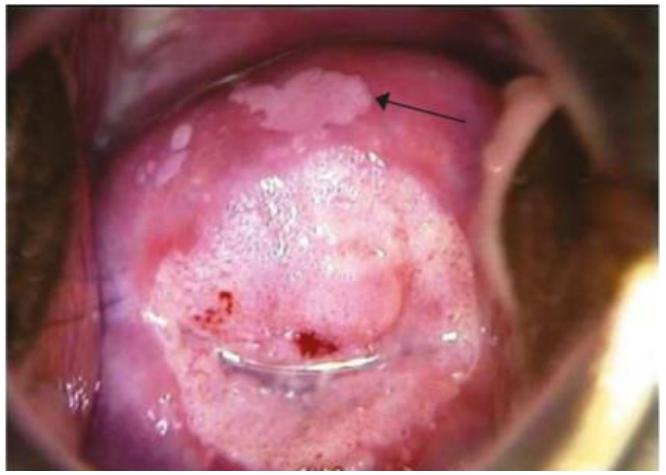
- During the peri-menopausal period and after menopause, the cervix shrinks due the lack of oestrogen and consequently, the SCJ moves inside the endocervical canal from the external os
- In post-menopausal women, the SCJ is often invisible on visual examination



Nabothian Cyst

- Nabothian cysts appear as bulging blue-white or yellow-white nodules, having a smooth delicate lining with branching blood vessels
- In some women, nabothian cysts can become large and distort the shape of the cervix
- Position of the crypt opening or the nabothian cyst farthest from the SCJ helps to identify the outer limit of the TZ

Physiological Changes in Cervical Epithelium



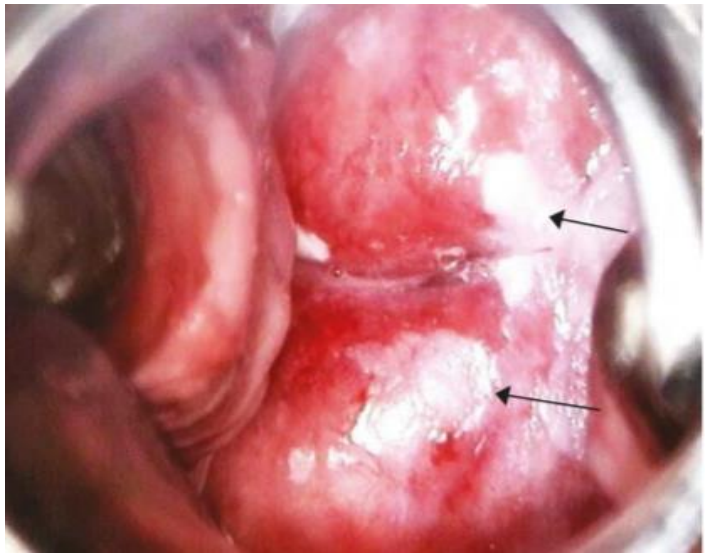
Cervical Condyloma

- Cervical condyloma appear as raised, grey-white areas within or outside the transformation zone in the squamous epithelium and may be accompanied by similar lesions in the vagina and vulva
- It usually appears as a distinctly lumpy, irregular lesion on the surface of the affected area, the colour may be bright white and the surface irregular, pitted or spiky
- Warts by themselves do not progress to malignancy. Extensive warts, however, may hide high-grade lesions in the deeper tissue

Cervical Polyp

- Cervical polyp is a localized overgrowth of the endocervical columnar epithelium and may be visible as a single or multiple reddish soft tumour(s) protruding from the external os
- A patient with polyps may present with abnormal menstrual bleeding or postcoital bleeding
- Polyps do not have any potential to become malignant

Physiological Changes in Cervical Epithelium



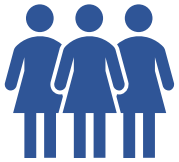
Leukoplakia

- Leukoplakia is a well demarcated white patch on the cervix often raised from the surface
- Leukoplakia is visible to the naked eye even before the application of acetic acid
- A leukoplakia on the TZ close to SCJ is often due to cervical neoplasia and should be referred for colposcopy
- Leukoplakia without underlying neoplasia requires no treatment

4 VIA (Visual Inspection with Acetic Acid) परीक्षण

Cervical Cancer - Screening Protocol

As per the operational guidelines of GOI NPCDCS Program



Target Population
All women in the age group of **30-65 years**

Frequency
Once in **every 5 years**

Procedure
VIA Examination

Facility Level
PHC and above

- **All women in the age group of 30-65 years, should be screened for cervical cancer using VIA, once in every 5 years, at PHC and above level facility**

When not to perform VIA screening

- As per the guidelines of Government of India, all the women in the age group of 30-65 years should be screened but a woman must not be screened under following conditions-
  - Anytime during menstrual cycle
  - During pregnancy
  - Within 12 weeks of postpartum or abortion
- In such cases woman should be asked to come after menstrual cycle or after 12 weeks of postpartum and abortion for VIA screening

VIA Principle

Visual naked eye examination of the cervix for early detection of cervical pre-cancer lesion after application of 5% acetic acid is called VIA

- VIA is the naked eye inspection of the cervix after application of 3–5% acetic acid using a good light source
- Results of VIA are immediately available and do not require any laboratory support
- Dilute acetic acid (3–5%) when applied on the cervix causes dehydration of cells and coagulation of the proteins on the surface epithelium
- Coagulated protein becomes prominent as a dense white patch
- Pre-cancers of cervix contain more protein which gets coagulated by acetic acid and gives a white appearance
- The higher the grade of cervical pre-cancer, the denser is the intensity of the white patch

White Lesion

VIA : Equipment and Consumables

VIA Tray

Equipment for VIA

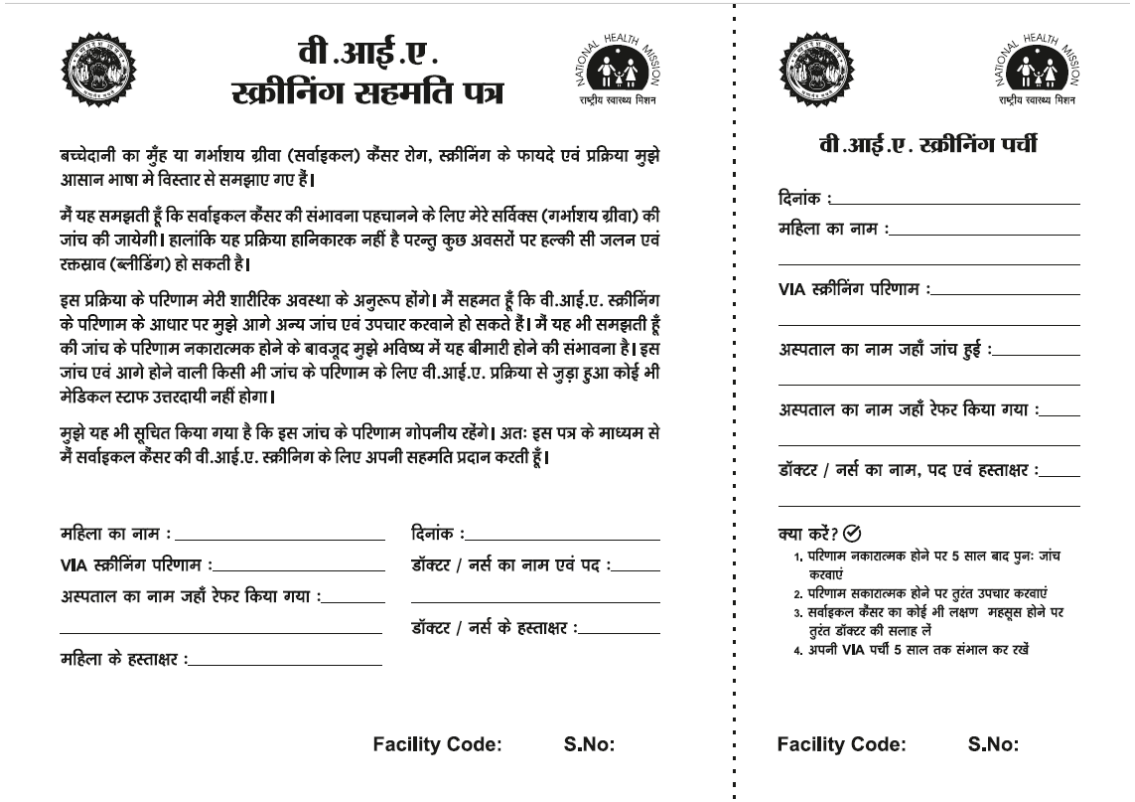
- Examination Table
- White light source
- Cusco's Speculum
- Forceps
- Syringe to measure glacial acetic acid
- Measuring cylinder to measure distilled water

Consumables for VIA

- Glacial acetic acid
- Distilled water
- Cotton balls
- Normal saline
- Examination gloves

VIA: Equipment and Consumables

- **VIA consent form register** and **VIA screening register** should also be available in the health care facility
- Written consent should be obtained prior to VIA screening and entry should be made in VIA register post screening



वी.आई.ए.
स्क्रीनिंग सहमति पत्र

बच्चेदानी का मुँह या गर्भाशय ग्रीवा (सर्वाइकल) कैंसर रोग, स्क्रीनिंग के फायदे एवं प्रक्रिया मुझे आसान भाषा मे विस्तार से समझाए गए हैं।

मैं यह समझती हूँ कि सर्वाइकल कैंसर की संभावना पहचानने के लिए मेरे सर्विक्स (गर्भाशय ग्रीवा) की जांच की जायेगी। हालांकि यह प्रक्रिया हानिकारक नहीं है परन्तु कुछ अवसरों पर हल्की सी जलन एवं रक्तस्राव (ब्लीडिंग) हो सकती है।

इस प्रक्रिया के परिणाम मेरी शारीरिक अवस्था के अनुरूप होंगे। मैं सहमत हूँ कि वी.आई.ए. स्क्रीनिंग के परिणाम के आधार पर मुझे आगे अन्य जांच एवं उपचार करवाने हो सकते हैं। मैं यह भी समझती हूँ की जांच के परिणाम नकारात्मक होने के बावजूद मुझे भविष्य में यह बीमारी होने की संभावना है। इस जांच एवं आगे होने वाली किसी भी जांच के परिणाम के लिए वी.आई.ए. प्रक्रिया से जुड़ा हुआ कोई भी मेडिकल स्टाफ उत्तरदायी नहीं होगा।

मुझे यह भी सूचित किया गया है कि इस जांच के परिणाम गोपनीय रहेंगे। अतः इस पत्र के माध्यम से मैं सर्वाइकल कैंसर की वी.आई.ए. स्क्रीनिंग के लिए अपनी सहमति प्रदान करती हूँ।

महिला का नाम : _____ दिनांक : _____

VIA स्क्रीनिंग परिणाम : _____ डॉक्टर / नर्स का नाम एवं पद : _____

अस्पताल का नाम जहाँ रेफर किया गया : _____

_____ डॉक्टर / नर्स के हस्ताक्षर : _____

महिला के हस्ताक्षर : _____

Facility Code: S.No:

वी.आई.ए. स्क्रीनिंग पर्ची

दिनांक : _____

महिला का नाम : _____

_____

VIA स्क्रीनिंग परिणाम : _____

_____

अस्पताल का नाम जहाँ जांच हुई : _____

_____

अस्पताल का नाम जहाँ रेफर किया गया : _____

_____

डॉक्टर / नर्स का नाम, पद एवं हस्ताक्षर : _____

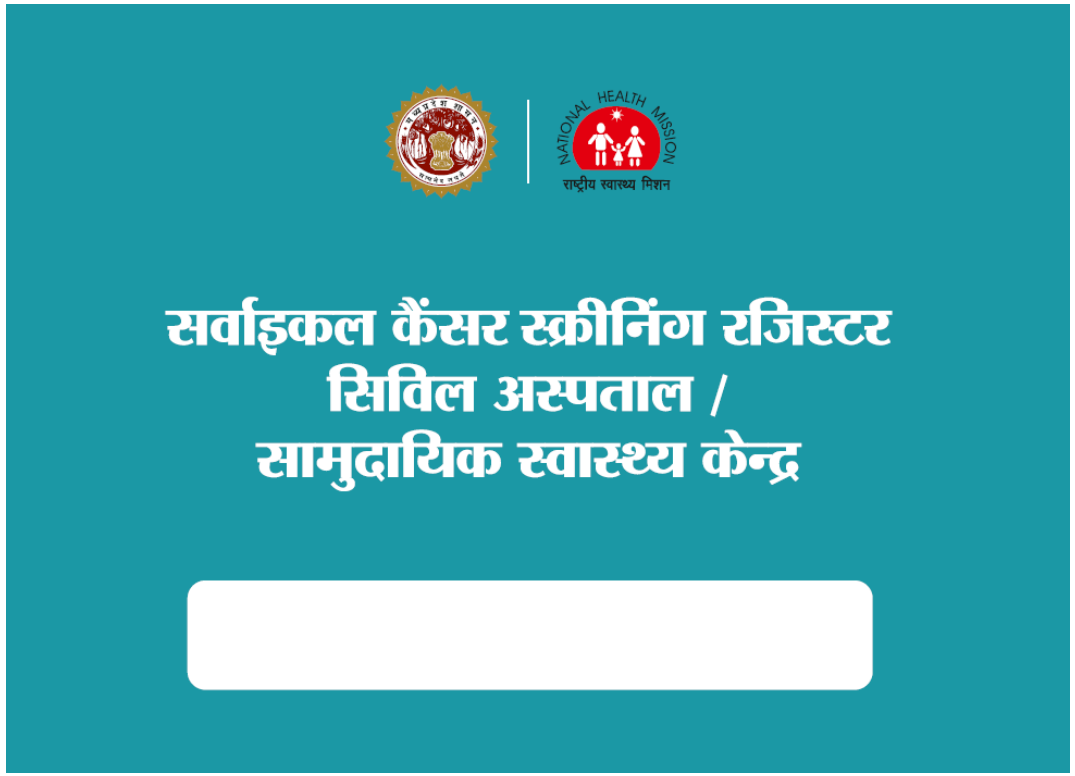
_____

क्या करें?

1. परिणाम नकारात्मक होने पर 5 साल बाद पुनः जांच करवाएं
2. परिणाम सकारात्मक होने पर तुरंत उपचार करवाएं
3. सर्वाइकल कैंसर का कोई भी लक्षण महसूस होने पर तुरंत डॉक्टर की सलाह लें
4. अपनी VIA पर्ची 5 साल तक संभाल कर रखें

Facility Code: S.No:

Consent Form



सर्वाइकल कैंसर स्क्रीनिंग रजिस्टर
सिविल अस्पताल /
सामुदायिक स्वास्थ्य केन्द्र

VIA Screening Register

Preparation of 5% acetic acid - 100 ml

1 Wear gloves

2 Add 95 ml of distilled water in measuring cylinder

3 Measure 5 ml of glacial acetic acid

4 Pour acetic acid into measuring cylinder

5 Pour diluted 5% acetic acid into a glass bottle

6 Label the bottle with the date of preparation

Note: Acetic acid should be freshly prepared, unused acetic acid should be discarded after 24 hours

Preparation of 5% Acetic Acid

- If the number of women to be screened in a health care facility is low, smaller volume of 5% acetic acid could be prepared
- Refer the table given below for volumes of distilled water and glacial acetic acid required for different volumes of 5% acetic acid

Volume of 5% acetic acid (ml)	Volume of glacial acetic acid (ml)	Volume of distilled water (ml)
20	**1**	**19**
40	2	38
60	3	57
80	4	76
100	5	95

Thank You!