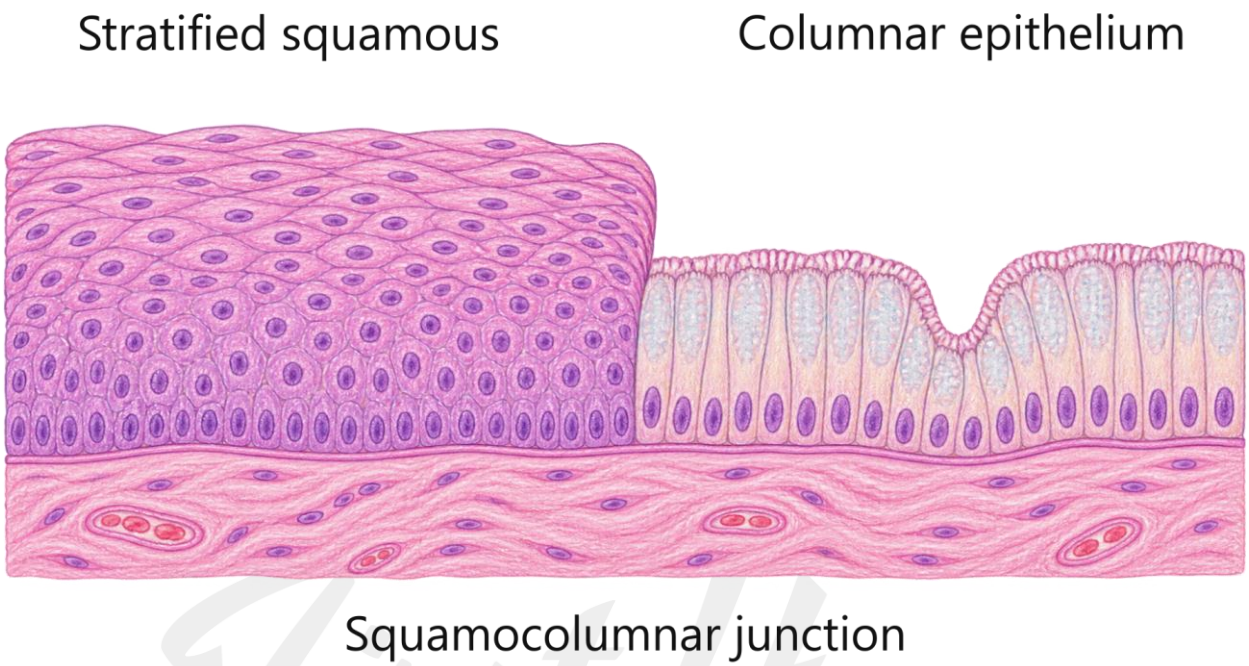
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Obstetrics & Gynaecology - Topic 33 - Benign, Pre-malignant (CIN) and Malignant Lesions of the Cervix

Cervical Lesions and Their Significance

The Transformation Zone

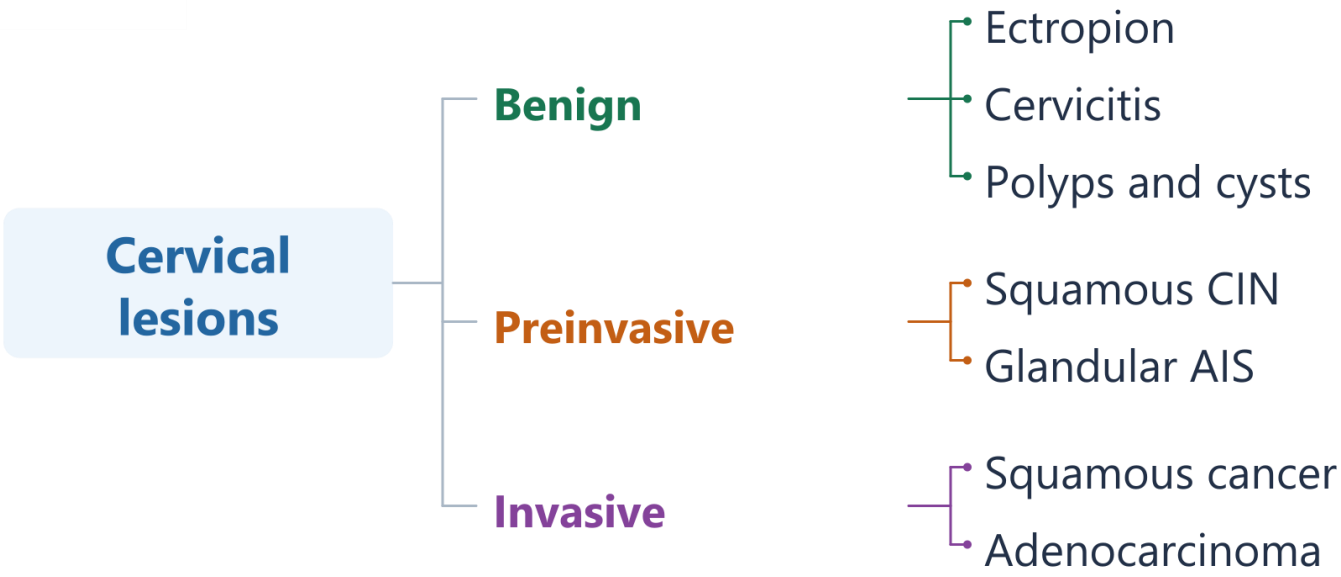


Stratified squamous and endocervical columnar epithelium meet at the cervical squamocolumnar junction

- The cervix has squamous epithelium on its outer surface and glandular columnar epithelium within the endocervical canal.
- The squamocolumnar junction is the boundary between these epithelia, and its position changes with age and hormonal state.
- The transformation zone is the area in which columnar epithelium has been replaced by squamous metaplasia.
- Most cervical precancers develop in this region, which is why adequate screening and colposcopy must assess it.
- After menopause, the junction may recede into the canal and become difficult to see with a simple visual examination.

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Broad Classification



1. Benign Lesions

A. Cervical Ectropion

- Cervical ectropion is exposure of columnar epithelium on the outer cervix and may occur with pregnancy or oestrogen exposure.
- It can appear red and produce discharge or contact bleeding, but it is not itself a precancerous ulcer.

B. Nabothian Cysts

- A nabothian cyst is a mucus-retention cyst and usually needs no treatment when its appearance is typical.

C. Cervical Polyps

- A cervical polyp may cause intermenstrual or postcoital bleeding and is commonly benign, although removed tissue should be assessed histologically.

D. Cervicitis

- Cervicitis may cause mucopurulent discharge and friability and should be investigated and treated for relevant infections.

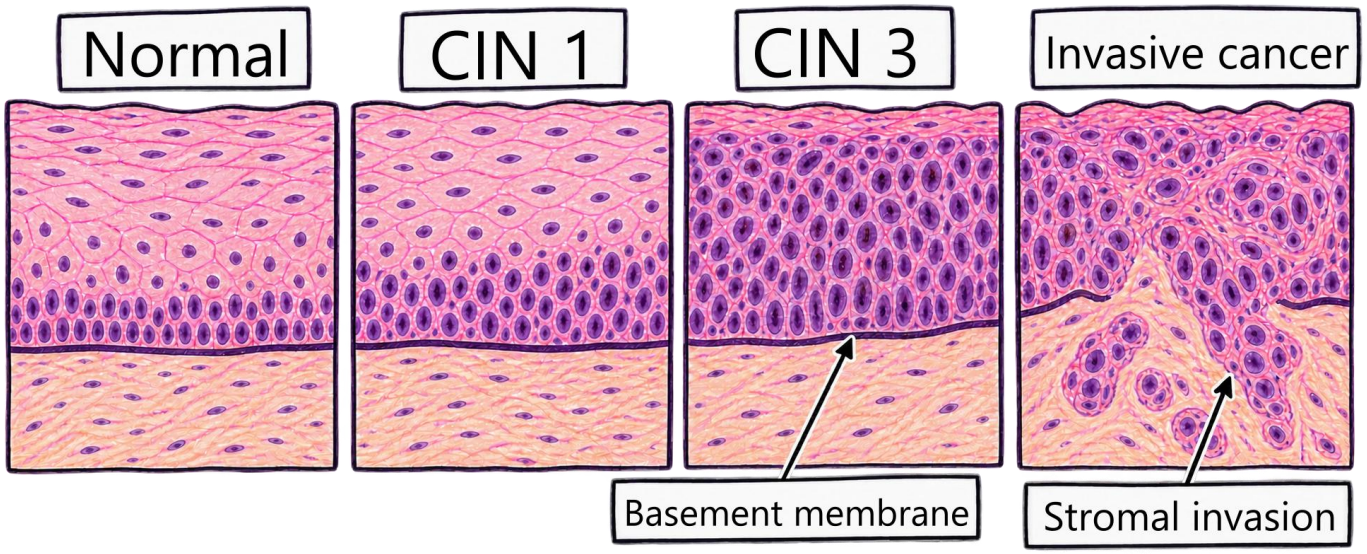
When a Benign Appearance Needs Reassessment

- An atypical, persistent or bleeding lesion requires assessment rather than automatic cauterisation.

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2. Preinvasive Lesions

A. Squamous Intraepithelial Lesions



Schematic squamous epithelial changes distinguish intraepithelial disease from invasion across the basement membrane

- Cervical intraepithelial neoplasia, or CIN, describes abnormal squamous cells that remain above an intact basement membrane.
- CIN 1 usually reflects a low-grade HPV-related change, while CIN 2 and CIN 3 represent higher-grade abnormalities with greater progression risk.
- Histological low-grade squamous intraepithelial lesion generally corresponds to CIN 1, and high-grade lesion includes CIN 2 and CIN 3.

B. Glandular Precursor Disease

- Adenocarcinoma in situ is a glandular precursor and requires a different diagnostic and excisional approach from a simple ectocervical low-grade lesion.

3. Invasive Cancer

- Invasive cancer has crossed the basement membrane into cervical stroma and can spread locally, through lymphatics or to distant organs.
- Squamous cell carcinoma is the commonest histological type, followed by adenocarcinoma; uncommon neuroendocrine and other tumours also occur.
- Not every adenocarcinoma is HPV-associated, so histological subtype matters when planning care.

Aetiology and Prevention

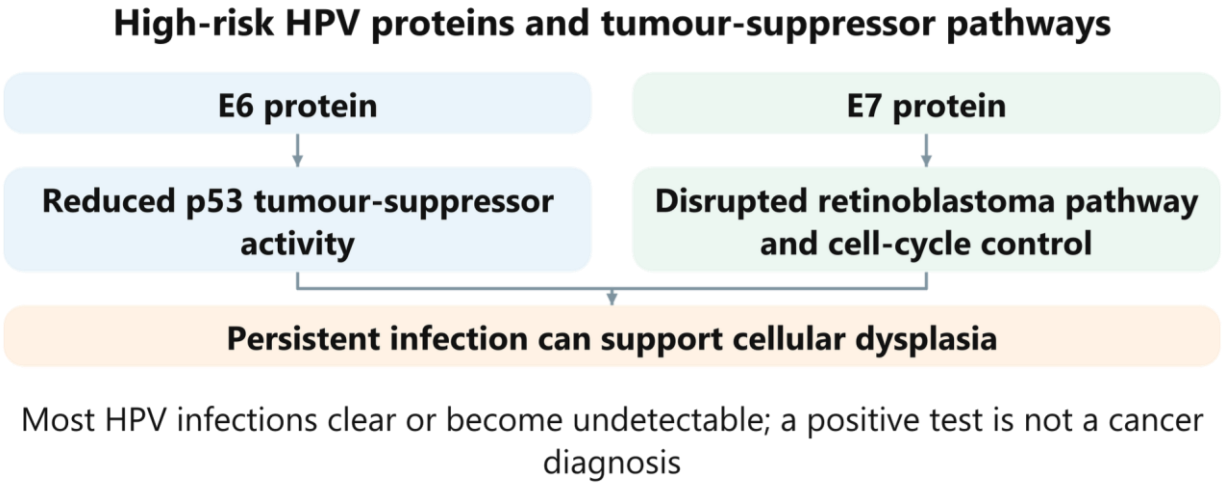
Persistent High-Risk HPV Infection

High-risk Types and Persistence

- Persistent infection with a carcinogenic human papillomavirus is the main cause of cervical cancer.

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- HPV 16 and 18 are particularly important high-risk types, while types 6 and 11 mainly cause anogenital warts.
- Most HPV infections clear or become undetectable, and a positive test does not mean that cancer is present.



Most HPV infections clear or become undetectable; a positive test is not a cancer diagnosis

Oncogenic Mechanisms and Interpretive Cautions

- Viral E6 and E7 proteins can disrupt tumour-suppressor pathways, helping persistent infection progress to cellular dysplasia.
- E6 promotes loss of p53 tumour-suppressor activity, while E7 interferes with the retinoblastoma pathway and cell-cycle control.
- Persistent high-risk infection is therefore important; a transient infection alone is not equivalent to progressive precancer.
- Smoking, immunosuppression and inadequate access to screening or treatment increase the likelihood of adverse outcomes.
- An HPV result cannot reliably establish when infection was acquired and should not be used to accuse a partner of infidelity.

Primary Prevention

HPV Vaccination and Continuing Screening

- HPV vaccination works best before exposure and prevents infection-related precancer; it does not treat an existing cervical cancer.
- India launched its national free HPV vaccination programme on 28 February 2026 for girls aged 14 years, using a single dose of quadrivalent Gardasil-4.
- The programme includes protection against HPV types 16 and 18 and wart-associated types 6 and 11, with delivery continuing on routine immunisation days after the launch campaign.
- Other age groups, immunocompromised patients and private-sector schedules require the relevant current national or product-specific guidance rather than automatic use of the programme's single-dose rule.

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- Vaccinated individuals still need recommended cervical screening because vaccination does not cover every cause of cervical cancer.

Other Preventive Measures

- Smoking cessation, safer sexual practices and accessible HIV care support prevention, although condoms do not completely prevent HPV transmission.

Screening and Early Detection

Screening Is Different from Diagnosis

- Screening tests apparently healthy people to identify those needing further assessment or treatment.
- Postcoital bleeding, persistent unusual discharge or a visible suspicious lesion requires diagnostic evaluation regardless of a recent screening result.
- A screening programme is effective only when abnormal results lead to appropriate follow-up and treatment.

Who Is Screened?

- India's established population-screening framework uses VIA for women aged 30–65 years at five-year intervals, with local programme updates and referral pathways applied.
- WHO prefers HPV-based primary screening, generally beginning at age 30, with a five-to-ten-year interval for an appropriate negative HPV DNA test in the general population.
- Women living with HIV need earlier and more frequent screening, commonly from age 25 with HPV-based screening every three to five years.
- Previous high-grade lesions, cancer, immunosuppression or abnormal results require an individual surveillance pathway rather than routine population intervals.
- WHO's 2026 guidance supports HPV genotyping as molecular triage and the transition towards organised HPV-based programmes.

Screening and Triage Methods

- HPV testing detects viral nucleic acid, whereas cytology examines exfoliated cells for abnormalities.

1. Visual Inspection with Acetic Acid

- A trained provider applies 3–5% acetic acid and inspects the cervix after about one minute with adequate light.
- A dense, well-defined acetowhite area related to the transformation zone can be suspicious, but inflammation or immature metaplasia can also produce whitening.
- Record whether the squamocolumnar junction and the entire lesion are visible, rather than simply recording white or not white.

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