



# GENITOURINARY SYSTEM

SUBJECT : Pathology

LEC NO. : 12

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وَقُلْ رَبِّ زِدْنِي عِلْمًا

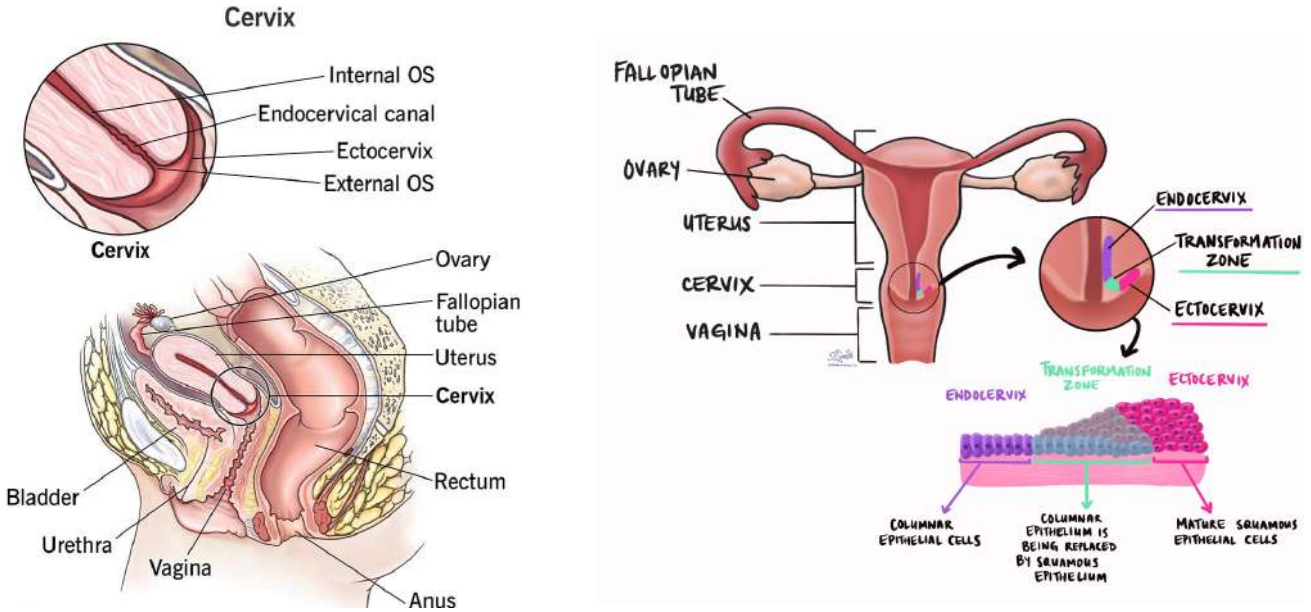


# GENITOURINARY SYSTEM

مصدر انصح فيه : <https://youtu.be/s1KIAUH3p8s?feature=shared>

تم اعتماد شرحه و كتابته باللون الاحمر

الآن حنبداً بموضوع ال cervix و نحكي عن أمراضه، بس قبل خرينا نراجع شوية اناتومي

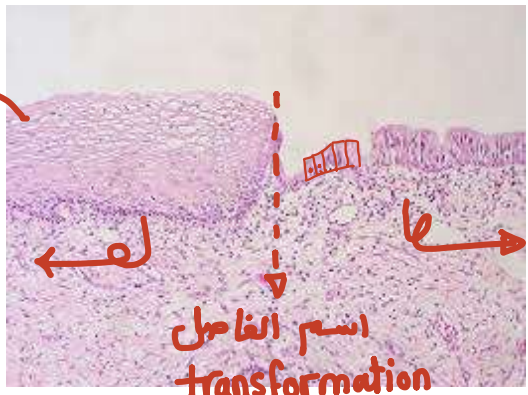


- The cervix is the neck of uterus, and it is divided into the ectocervix and endocervix  
 بالعادة لما نعمل examination للمريضة ممكن نشوف ectocervix و لكن ال endocervix صعب  
 و حتلاحظوا انه في فرق بين الثنين و نوع ال epithelium برضه مختلف بينهم  
 كيف؟؟

- The ectocervix is lined by stratified squamous epithelium
- The endocervix is lined by columner epithelium

لاحظوا لون الخلايا فاتح ←

this is ectocervix ←



→ this is endocervix

اسم الفاصل  
 transformation  
 zone

↑ و نحكي عنه كثير اليوم

فلا تنسوه ♡

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## Cervicitis

هاد الموضوع دكتور غازي شرحه بأول 18 دقيقة و شرحه حلو كثير

\* Inflammation of cervix uteri

\* Predisposing factors :

1- trauma ->

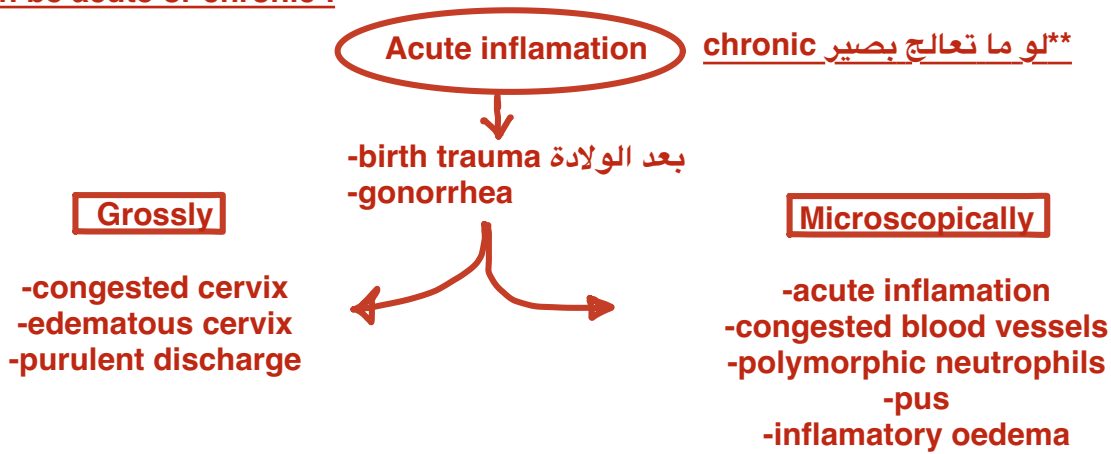
مثل ما بصير بالولادة او استخدام ادوات الكشف بطريقة خاطئة

2- Estrogen -> زيادته او نقصانه برضه ممكن تأثر ->

3- PH -> alkalinity of cervical mucous induce infections

4- Excessive secretion

\* It can be acute or chronic :



### Chronic inflammation

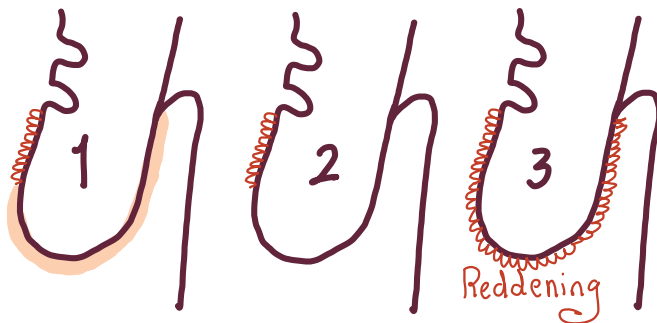
- more common
- branched gland
- no shedding as endometrium
- The pathological findings are :

#### 1- Leukorrhoea



It is a mucopurulent discharge  
زي المخاط الي نازل من عنق الرحم

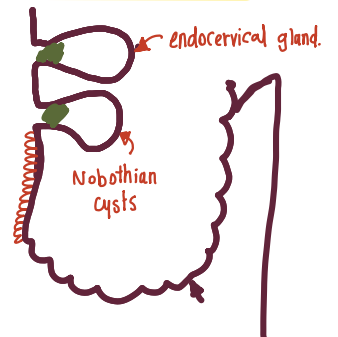
#### 2- cervical erosion



بنتقطع الخلايا في ectocervix و بصير له shedding و بعدين بتبدأ خلايا ال endocervix تتحرك باتجاه ال ecto  
This is not called metaplasia, it is called cervical erosion

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#### 3- granularity of cervix around external os



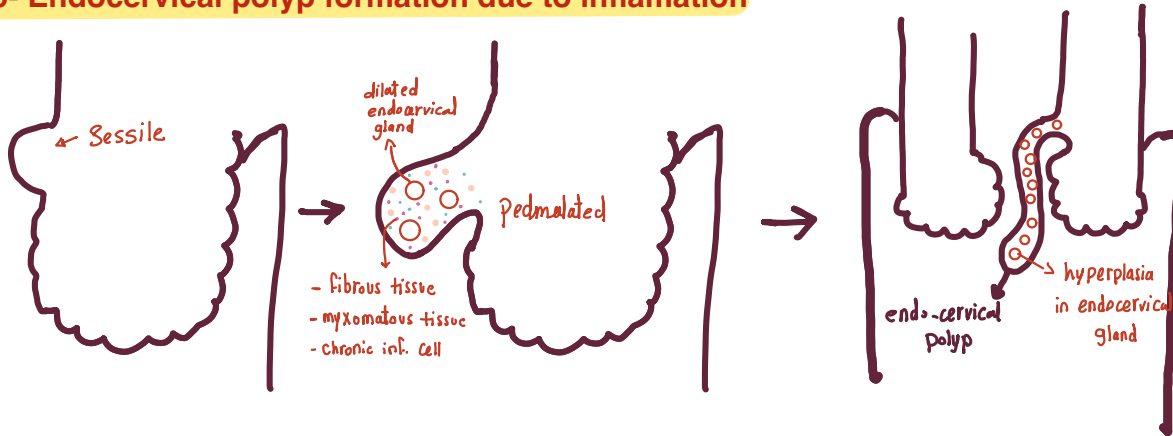
4- Nabothian cysts: Obstruction of openings of endocervical gland



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→ non-neoplastic

## 5- Endocervical polyp formation due to inflammation



بتصير ال gland تعمل proliferation و بتصير تعمل cystic dilatation و بتبدأ تعمل ال polyps بالبداية حتكون sessile و بعدين بتصير pedunculated و ال core تبعها عبارة عن endocervical gland containing fibrous tissue, myxomatous tissue and chronic inflammatory cells

يلا عالسلایدات، لو فاهم الي فوق ما رح تتغلب

## CERVIX

- ❖ The cervix serves as a **barrier** to the entrance of air & the microflora of the normal vagina, yet **it must permit** the escape of menstrual flow & be capable of dilating to accommodate childbirth.

## CERVICITIS

It is very common

### Predisposing factor :

- 1-trauma (child birth m instrumentation during vaginal examination 0
- 2-High and low level of estrogen
- 3-Excessive secretion
- 4- Alkaline media of cervical canal during ovulation

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- Cervicitis are extremely common & are associated with a mucopurulent to purulent vaginal discharge.
- Cytologic examination of the discharge reveals WBC & inflammatory atypia of shed epithelial cells, as well as possible microorganisms.
- may be acute cervicitis (child birth and sexually transmitted disease gonorrhea Chlamydia, Herpes, Trichomoniasis, It is often confused with vaginitis.
- **chronic cervicitis**, more common is used for women with persistent discharge for three months despite the resolution/exclusion of infection.

\*Note : Bleeding after intercourse -> cervical cancer unless proven otherwise

\*There is a shedding in cells

\*Note the red congested area in the picture



Chronic Cervicitis is associated with:

اكثر من ٣ شهور

1- **Leukorrhea (vaginal discharge)**

2- **Destruction of stratified squamous epithelium of ectopic CX**

3- Growth of columnar epithelial of endocervix causing **cervical erosion** (reddening of ectocervix)

4- **Granularity of ectocervix**

انتبهوا انه هاد مو metaplasia

5- **Development of nabothian cyst**

6- **Endocervical polyp**

7- Cervicitis is caused by organisms that can move up into the uterus and fallopian

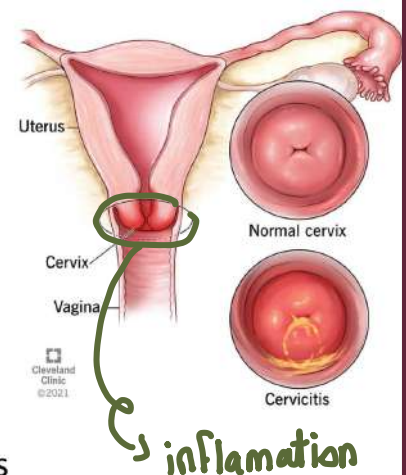


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**Grossly**, nonspecific cervicitis may be either:

- ❖ (1) the relatively uncommon **acute nonspecific form** limited to postpartum women & is usually caused by staphylococci or streptococci, or
- ❖ (2) the common, nearly ubiquitous, ever-present entity usually referred to as chronic **nonspecific cervicitis**.

- ❑ Frequently, overgrowth of the regenerating squamous epithelium blocks the orifices of endocervical glands in the transformation zone to produce small Nabothian cysts lined by columnar mucus-secreting epithelium.



Very important

## Cervical ectropion

occurs when there is eversion of the endocervix, exposing the columnar epithelium to the vaginal milieu. It is also known as a cervical erosion, although no "erosion" of cells actually occurs.

It is a normal **physiological condition**, which is commonly seen on examination of the cervix in adolescents, in pregnancy, and in women taking **estrogen containing contraceptives**.

This change is thought to be **induced by high levels of estrogen**, and does not represent metaplasia.



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## Nabothian cyst

- is a mucus-filled cyst on the surface of the cervix.
- They are most often caused when stratified squamous epithelium of the ectocervix (portion nearest to the vagina) grows over the simple columnar epithelium of the endocervix (portion nearest to the uterus).
- This tissue growth can block the cervical crypts trapping cervical mucus inside the crypts.
- Nabothian cysts appear most often as firm bumps on the cervix's surface
- Nabothian cysts usually require no treatment and frequently resolve on their Own if nabothian cysts occur with chronic cervicitis (inflammation of the cervix) then the underlying cause of the inflammation must be treated





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## \* مطلوب منا بس معلومة مهمة لنا يا حباء \*

A 24-year-old woman presents in the emergency department with high fever, vomiting, and abdominal pain. She has a history of intermittent yellowish vaginal discharge and abdominal discomfort for the past few months. She is sexually active and uses oral contraceptive pills for contraception. On physical exam, she has adnexal tenderness. Rovsing and Psoas signs are negative. On pelvic exam, pus is seen at the cervical os, and it bleeds on touching with a cotton applicator. Her pregnancy test is negative. What is the most likely diagnosis?

✔ Well done! You answered successfully

- A. Appendicitis
- B. Ruptured ectopic pregnancy
- C. Pelvic inflammatory disease
- D. Small bowel obstruction

- ▶ Pelvic inflammatory disease is a serious complication of untreated cervicitis. مهمة
- ▶ Fever and abdominal, adnexal, or cervical motion tenderness are signs of upper genital tract infection.
- ▶ Women aged 15-24 with multiple sexual partners are at greater risk for STDs, and treatment should be initiated empirically to prevent recurrent disease or serious complications.
- ▶ Management of PID involves prompt initiation of parenteral broad-spectrum antibiotics, along with imaging to rule out a tubo-ovarian abscess.

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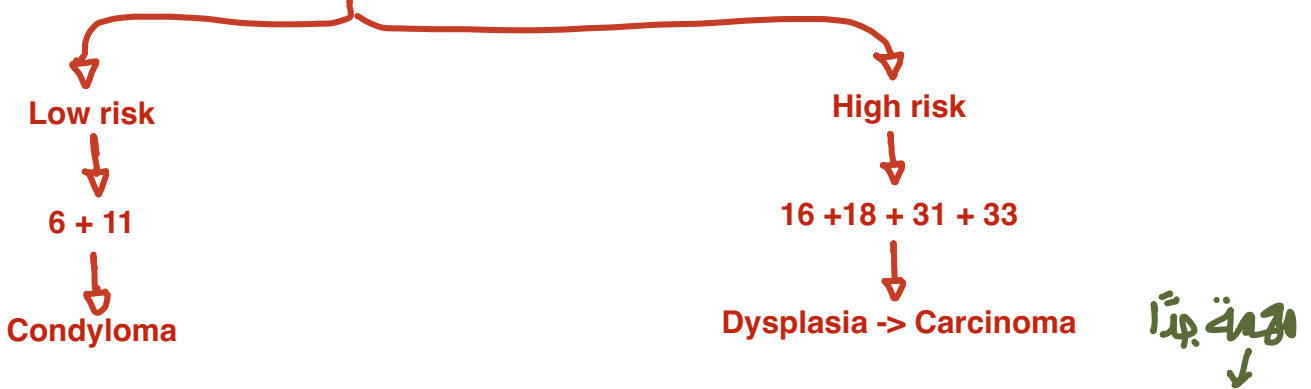




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## HPV infection

- it is a sexually transmitted DNA virus
- it has 2 types according to the DNA sequence:



- infect the lower genital tract, esp cervix in the **transformation zone**.
- **persistent** infection leads to risk for CIN.
- The risk of CIN depends on the type of HPV

The target of HPV is. Squamocolumnar junction

## Cervical intraepithelial neoplasia (CIN)

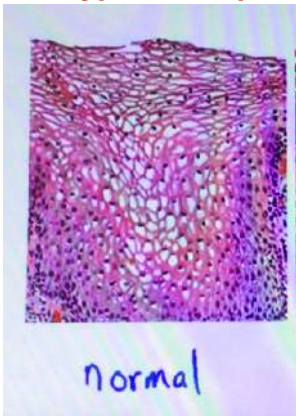
\*or we can call it cervical dysplasia.

دكتور سامح شرح هاي الجزئية من دقيقة 19 حتى 27 و هي مهمة و اكيد عليها سؤال

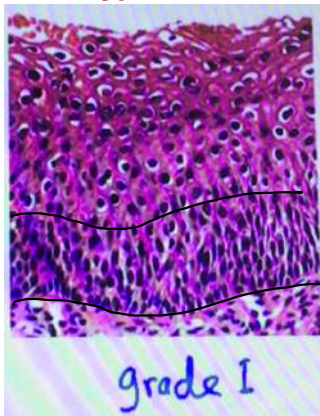
\*caused by HPV type 16 + 18 (high risk type) or called oncogenic virus.

\*the target of this virus is **squamocolumnar junction**; the area where endocervix and ectocervix meet. Especially the basal layer of this junction

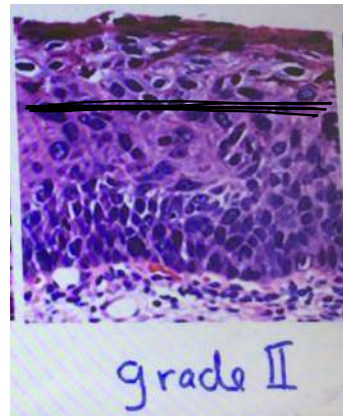
\* this type of neoplasia has 3 types:



لاحظوا بالطبيعة كل ما اطلع فوق بصغر حجم الخلايا و لونها يكون بينك



When the basal 1/3 of the epithelium has a dyplastic change (Mild dysplasia)



When 2/3 of the epithelium has a dyplastic change (Moderate dysplasia)



When the full thickness of the epithelium has a dyplastic change (Severe dysplasia) or (Bowen's disease)

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\*Both grade 1 and grade 2 are **reversible**,

\*Grade 3 will progress into an **invasive cancer**.

\*what makes high risk HPV high risk? What is about the virus the make it high risk?

-High risk HPV produces 2 types of proteins E6 and E7: مهم اوي بحبوه بالامتحانات :

-E6 -> increases destruction of p53 ( programmed cell death ) .

-E7 -> increases the destruction of Rb ( regulate cell cycle progressio) .

→ So these proteins inhibit the tumor suppresser genes .

\*CIN is characterized by koilocytic change, nuclear atypia and increased mitotic activity.

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## Cervical Intraepithelial Neoplasia (CIN)

**DYSPLASTIC CHANGES OCCUR TO THE THICKENING OF THE CERVIX**

Dysplasia graded depending on the extent of epithelial involvement:

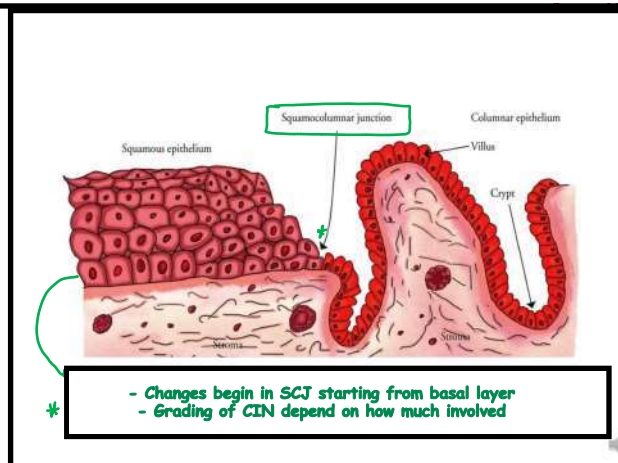
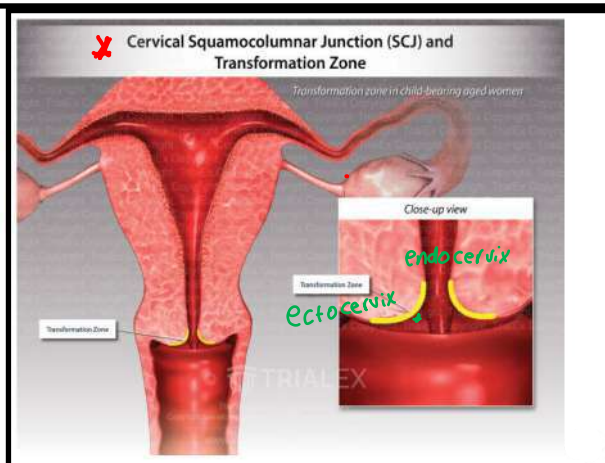
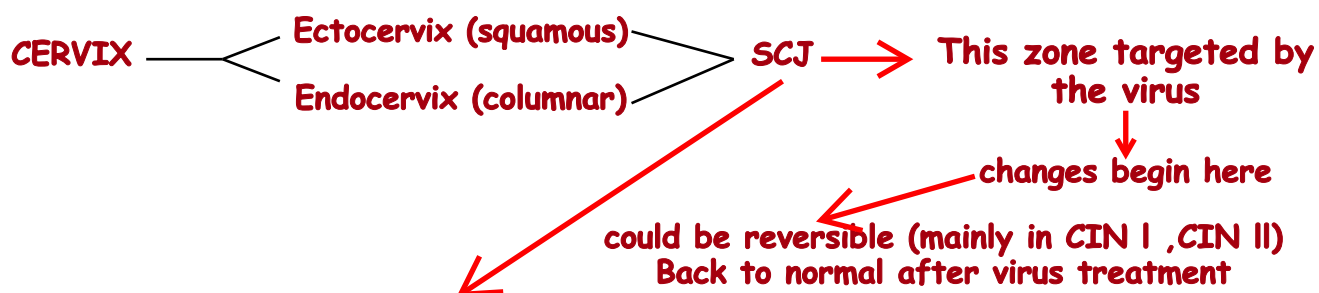
\* **CIN I:** Mild dysplasia (<math>\leq</math> third of full epithelial thickness) ↳ BASAL LAYER

\* **CIN II:** Moderate dysplasia (up to 2/3 of full epithelial thickness)

\* **CIN III:** Severe dysplasia in full epithelial thickness (carcinoma in situ)

↳ without invading BM

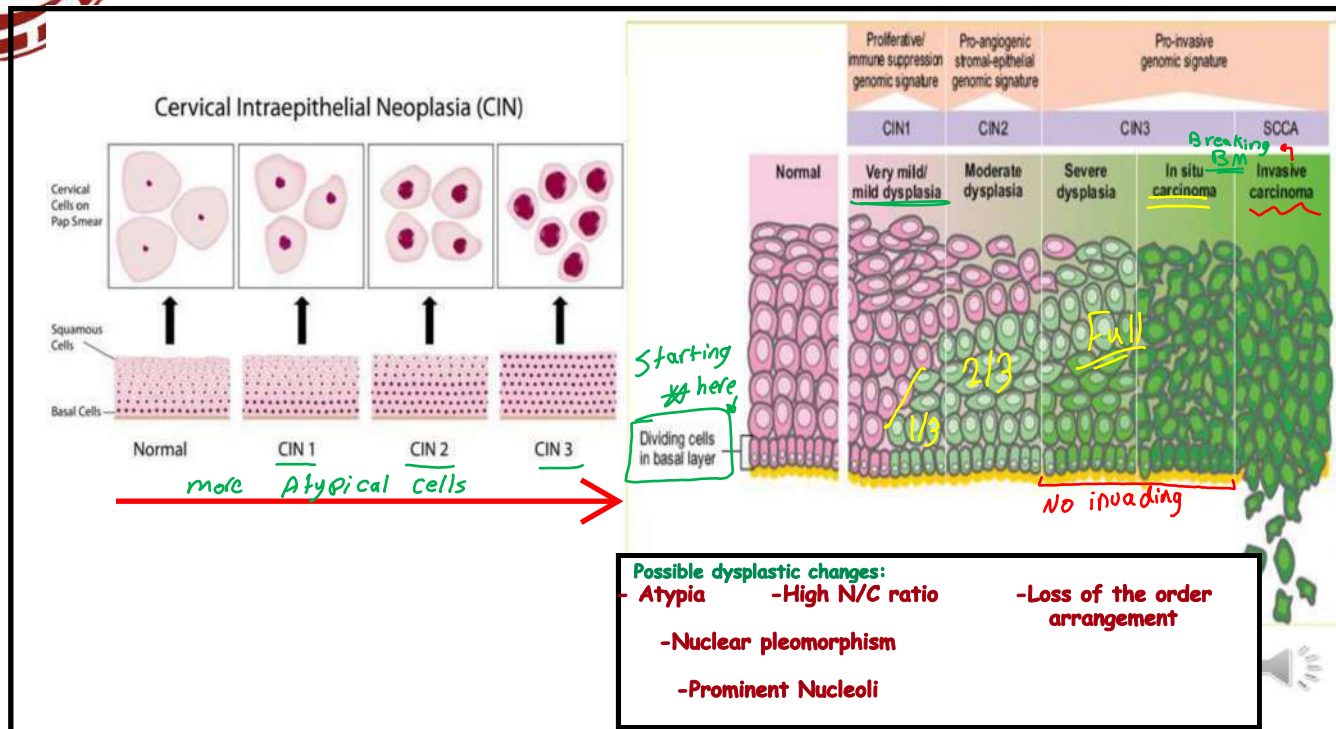
**CIN : Dysplastic changes of cervix caused by HPV (MAINLY HPV16, HPV18)**



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## CIN-Epidemiology and Pathogenesis

- ❑ peak age of CIN is 30 years, whereas invasive cancer is about 45 years.
- ❑ HPV can be detected by molecular methods in nearly all precancerous lesions and invasive neoplasms.
- ❑ high-risk HPV types (16, 18, 45, and 31), account for majority of cervical ca
- ❑ It is important to emphasize here that: nearly all invasive cervical SCC arise from precursor CIN.
- ❑ However, Not all cases of CIN progress to invasive ca & indeed many persist without change or even regress!

**all invasive cervical SCC arise from CIN BUT NOT necessary that all CIN progress to invasive cervical SCC**

**ROUTINE screening by Pap Smear :**  
simple, non-invasive, cheap

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Very important

## Pathogenesis

- ❑ HPV 16 and 18 usually integrate into the host genome and express large amounts of E6 and E7 proteins, which block or inactivate tumor suppressor genes p53 and RB, respectively. Sexually transmit imp
- ❑ Recently introduced **HPV vaccine** used in USA and Europe is effective in preventing HPV infections and hence cervical cancers.
- ❑ Cytological examination can detect CIN long before any abnormality can be seen grossly.
- ❑ The follow-up of such women has revealed that:
  - ❖ (I) Precancerous CIN may precede the development of an overt ca by many years, or in some cases even decades. However, (II) a fraction of cases of CIN progress to invasive ca. ↳ Not all cases

- ❖ The precancerous CIN may begin as:
  - (I) low-grade & progress to higher CIN grade, or
  - high-grade CIN arise de novo, [depending] on:
    1. the location of the HPV infection in the transformation zone (scj)
    2. type of HPV infection (high or low risk)
  - **other** contributing host factors.

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❖ **Important risk factors** for the development of CIN & invasive cervical ca are:

- (1) Early age at first intercourse.
  - (2) Multiple sexual partners.
  - (3) A male partner with multiple previous sexual partners.
  - (4) Persistent infection by "high-risk" HPV papilloma viruses. Many other risk factors can be related to these 4, including the higher incidence in lower socioeconomic groups & the association with multiple pregnancies, & rarity among virgins.
- They point to the likelihood of sexual transmission of a causative agent, in this case → HPV.

Very important

Hallmark of cytopathic effect of HPV

## Morphology

The cervical epithelial changes included within the term

(I) In **CIN I**, begin with **mild dysplasia**, characterized by **Koilocytosis** {produced by cytopathic effect of HPV} seen mostly in the superficial layers of the epithelium, composed of **nuclear hyperchromasia** & **angulation with perinuclear vacuolization** imp

(II) In **CIN II** the dysplasia is more severe, **Involve 2/3 of epithelium**

- with (1) maturation of keratinocytes delayed into the middle third of the epithelium, (2) cell & nuclear size pleomorphism, heterogeneity of nuclear chromatin & (3) **mitoses** above the basal layer, extending in to the middle third of the epithelium. The superficial layer of cells shows some differentiation.

DYSPLASTIC, HPV-INFECTED EPITHELIAL CELLS: KOILOCYTES.



- \* IMMATURE SQUAMOUS
- \* DENSE, IRREGULARLY STAINING CYTOPLASM
- \* PERINUCLEAR CLEARING

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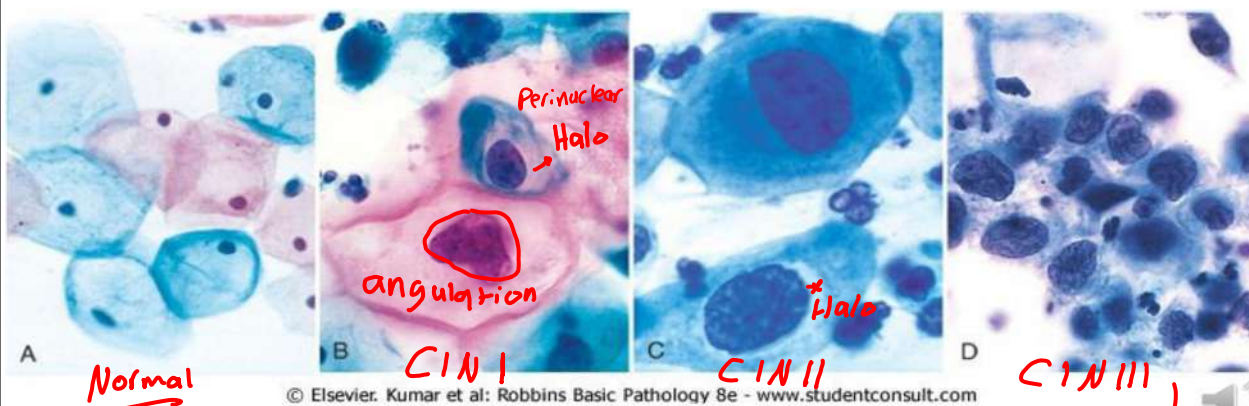
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(III) **CIN III** shows <sup>1</sup> greater pleomorphism in cell & nuclear size, <sup>2</sup> marked hyperchromasia, & <sup>3</sup> disorderly orientation of the cells, & normal or abnormal <sup>4</sup> mitoses; these changes affect virtually <sup>\*</sup> all layers of the epithelium & are characterized by <sup>\*</sup> loss of maturation; i.e., <sup>\*</sup> the differentiation of surface cells & koilocytotic changes have usually disappeared?

(IV) In time, dysplastic changes become more atypical & may extend into the end cervical glands, <sup>\*</sup> but the alterations are confined to the epithelial layer & its glands. These changes constitute carcinoma in situ.

<sup>\*</sup> <sup>\*</sup> → The next stage, if it is to appear, is invasive ca, however, as emphasized, there is no inevitability to this progression.

**Papanicolaou smear:** A, Normal exfoliative superficial squamous epithelial cells. B, CIN I. C, CIN II. D, CIN III. ★Note (1) the reduction in cytoplasm & (2) the increase in the nucleus-to-cytoplasm ratio as the grade of the lesion increases. ★This reflects the progressive loss of cellular differentiation of the cervical surface lesions from which these cells are exfoliated.



Pap smear:



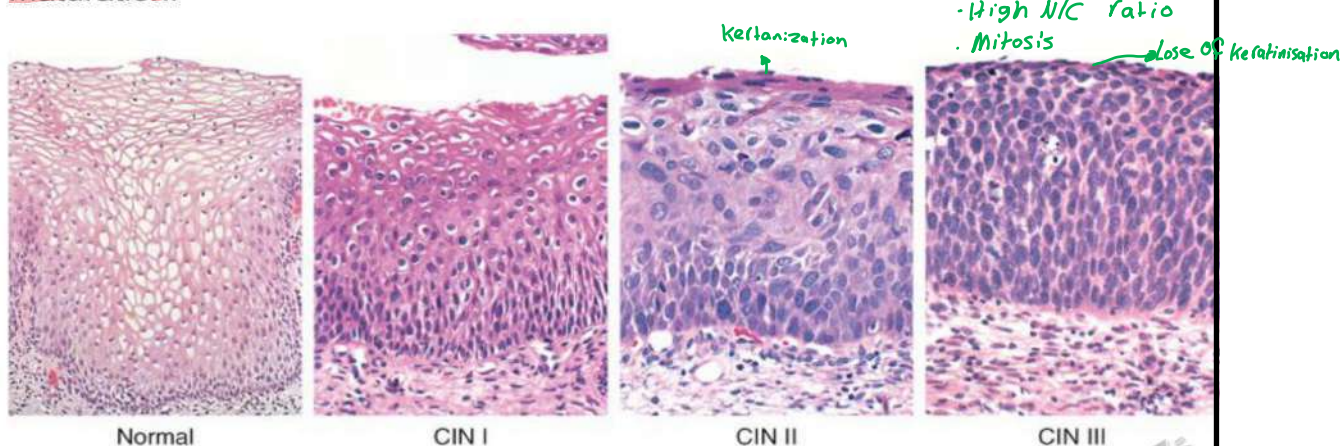
وقبل زردني علماً

colposcopy should be done to confirm the diagnosis



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**Spectrum of CIN:** Normal cervical squamous epithelium for comparison. CIN I with koilocytotic atypia; CIN II with progressive atypia in all epithelial layers CIN III (ca in situ) with full thickness diffuse atypia & loss of maturation.



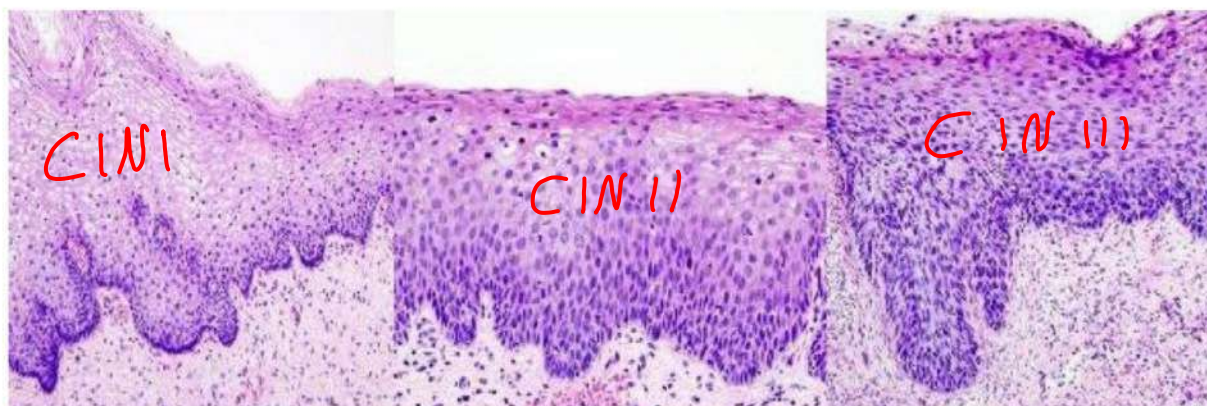
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**NOTE** that the dysplastic changes involve :

- lower 1/3 in CIN I
- middle 2/3 in CIN II

However, the cytopathic effect of the virus (koilocytosis) reach to the superficial layers in BOTH : CIN I, CIN II

Cervical Intraepithelial neoplasia (CIN). A) CIN grade I showing dysplastic squamous cells in the lower one-third of the epithelium. B) CIN grade II showing dysplastic squamous cells in the basal two-thirds of the epithelium. C) CIN grade III showing dysplastic squamous cells marked throughout the full thickness of the epithelium.



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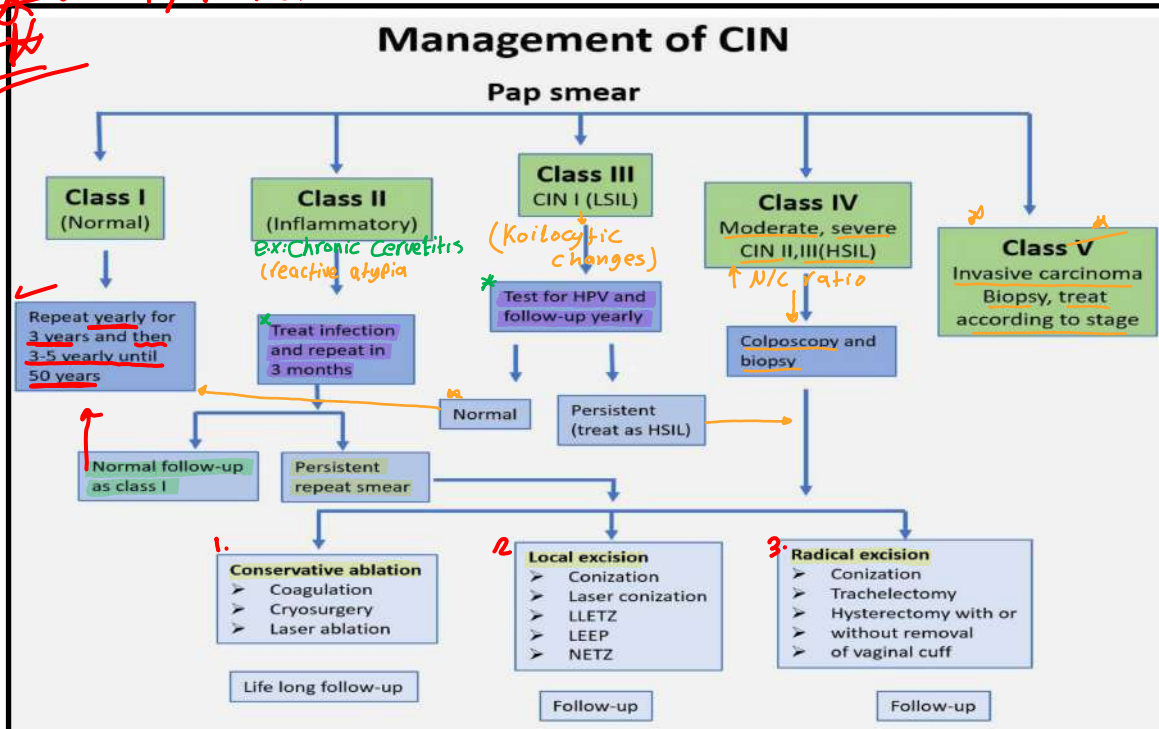




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*V. imp / Past Q.*

Very important



LSIL = low grade squamous intraepithelial lesion *CIN I*

HSIL = high grade squamous intraepithelial lesion *CIN II, CIN III*

*CIN I & CIN II* → reversible changes → after treatment of HPV → regress to normal

-So early diagnosis is very important for control the prognosis

## HPV Related Disease

- Genital warts **HPV 6, HPV 11**
- CIN → Cervical Cancer
- VIN → Vulvar Cancer
- VaIN → Vaginal Cancer
- AIN → Anal Cancer
- PIN → Penile Cancer
- Recurrent Laryngeal Papillomatosis
- Head & Neck Cancers

1. Walboomers JM et al. *J Pathol.* 1999  
 2. WHO 1999  
 3. Herrero R et al. *J Natl Cancer Inst.* 2003;95:1772-1783.



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## Cervical Cancer

\*invasive carcinoma that arises from cervical epithelium .

\*most commonly seen in **middle-age women** 40-50y.o .

\*presents as **vaginal bleeding** especially after the sexual inter course

و هاي خلوها قاعدة عندكم لقدام اي امرأة بتيجي بتعاني من نزيف من cervix بعد sexual intercourse بعترها انها --< cevical carcinoma until proved  
اما لو المرأة كانت post menopausal و صار عندها vaginal bleeding -< بعتر عندها endometrial cancer  
لحتى اتأكد

\*key risk factor is high risk **HPV** infection.

\*secondary risk factors include **smoking** and **immunodeficiency** .

\*other risk factors : CIN type 3 - genetic factors - early age of marriage - multiple sexual partners  
- sex with infected men (penile condyloma or not circumcised ختان) - chronic cervicits.

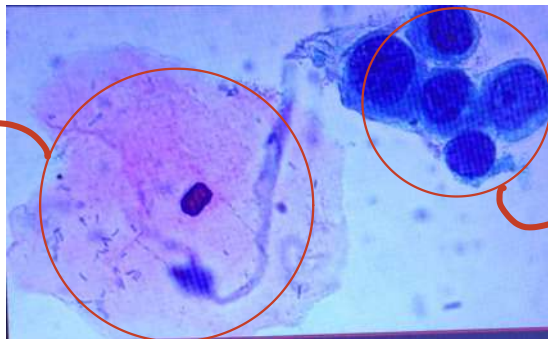
\*most common subtypes : squamous cell carcinoma + adenocarcinoma, and both types are related to **HPV** . مهم نعرف انه الاثنين الهم علاقة بالفايروس و الاشهر هو الاول .

\***advanced tumors** : often **invade** through anterior uterine wall into **bladder** causing a post renal failure and death

\*Pap smear is the gold standard for screening, and then we confirm it through colposcopy and biopsy

هاي الصورة ل pap smear تحت الميكروسكوب

normal cells ←



→ malignant cells .

- The normal cell -> small nucleus, low N/C ratio, a lot of cytoplasm

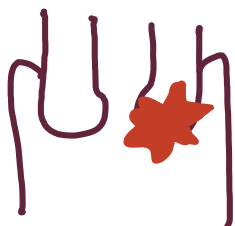
- The malignant cell -> larger nucleus, high N/C ratio, with a little cytoplasm, dark and hyper chromatic



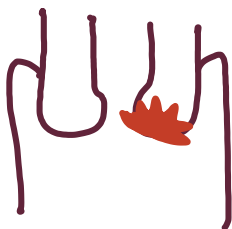
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## \* GROSSLY :

1- fungating mass



2 - migrant mass



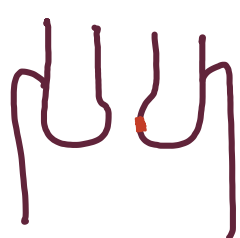
3- diffuse infiltrating



- The most common type
- flower mass
- projecting from surface
- fixed to underline

- Thickening in the wall
- Narrowing of the lumen

## \* STAGES :

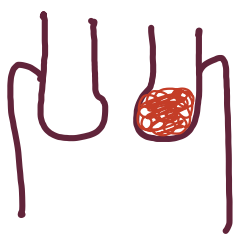


0  
↓

Carcinoma in situ

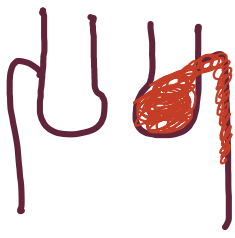


الورم في مكانه ولم ينتشر في مكان آخر ويكون flat



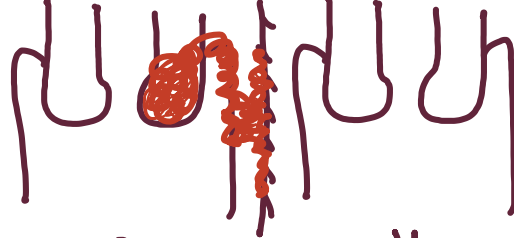
1  
↓

Localized to cervix



2  
↓

Cervix with vagina



3  
↓

Cervix with vagina with lateral pelvic wall

4  
↓

to distant area

ويكون كالعنق  
اس

## \* SPREAD :

Lymphatic spread → Pelvic Lymph nodes

Blood Spread → Lung, Liver, Kidney, Bone

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## Cervical cancer

- most common are **SCC (75%)**, followed by **adenocarcinomas** and **adenosquamous carcinomas (20%)**, and **neuroendocrine carcinomas (<5%)**.
- **SCC** now has peak incidence at **45 years**, almost **10 to 15 years after detection of their precursors: cervical intraepithelial neoplasia(CIN)**.
- The **only reliable way to monitor the course of the disease** is with **careful follow-up & repeat biopsies**.

## Grossly

- invasive cervical ca develop in the region of the **transformation zone** & range from **invisible** microscopic foci of early stromal invasion to **grossly visible exophytic cancers** encircling the os. Ca encircling the cervix & penetrating into the underlying stroma produce a **"barrel cervix,"** which can be identified by direct palpation.
- Extension into the **parametrial** soft tissues can **fix the uterus to the pelvic structures**.
- Spread to **pelvic LNs** is determined by (1) **T depth** (ranging from < 1% for T < 3 mm in depth to more than 10% once invasion is more than 5 mm), & (2) the **presence of capillary-lymphatic invasion**,

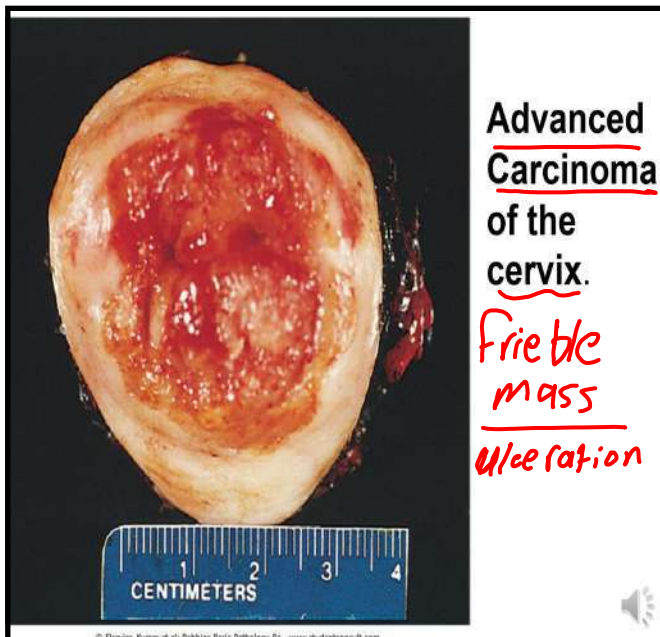
**FUNDUS OF UTERUS + OVARY >>>> spread directly to para aortic LNs**

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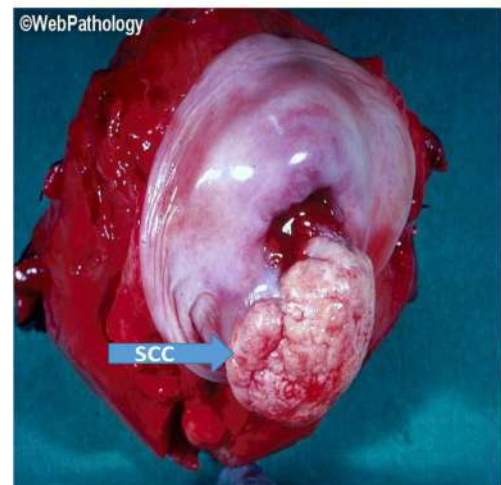


# GENITOURINARY SYSTEM

- ❑ Invasion of **adjacent structures** {vagina, ureters, bladder or rectum} & **distant metastases** {including para-aortic LN & remote organs} occur **late in the course of disease.**
- ❑ With the exception of neuroendocrine T, which are uniformly aggressive in their behavior, the cervical ca are: ★ **graded from 1 to 3 based on cellular differentiation &**
- ❑ **staged from 1 to 4 depending on clinical spread.**



**Squamous carcinoma: cervix.** Irregular, polypoid tumor involving the ectocervix protruding from the cervix.



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# GENITOURINARY SYSTEM

This is a larger cervical squamous cell carcinoma which spread to the vagina. A total abdominal hysterectomy with bilateral salpingo-oophorectomy (TAH-BSO) was performed.



Fungating mass involving cervix

## Clinical Aspects Of Cervical Cancers

- With the advent of the Pap smear, an ↑proportion of cervical ca are diagnosed early in their course (stage 1).
- The vast majorities of cervical T are diagnosed in the preinvasive phase & appear as white areas on colposcopy examination after application of dilute acetic acid.
- **More advanced** cervical ca are invariably seen in:-
  - (1) women who either have never had a Pap smear, or
  - (2) have waited many years since the prior smear.
- Clinically :such tumors may cause unexpected vaginal bleeding, leukorrhea, painful coitus (dyspareunia), & dysuria, and post coital bleeding.

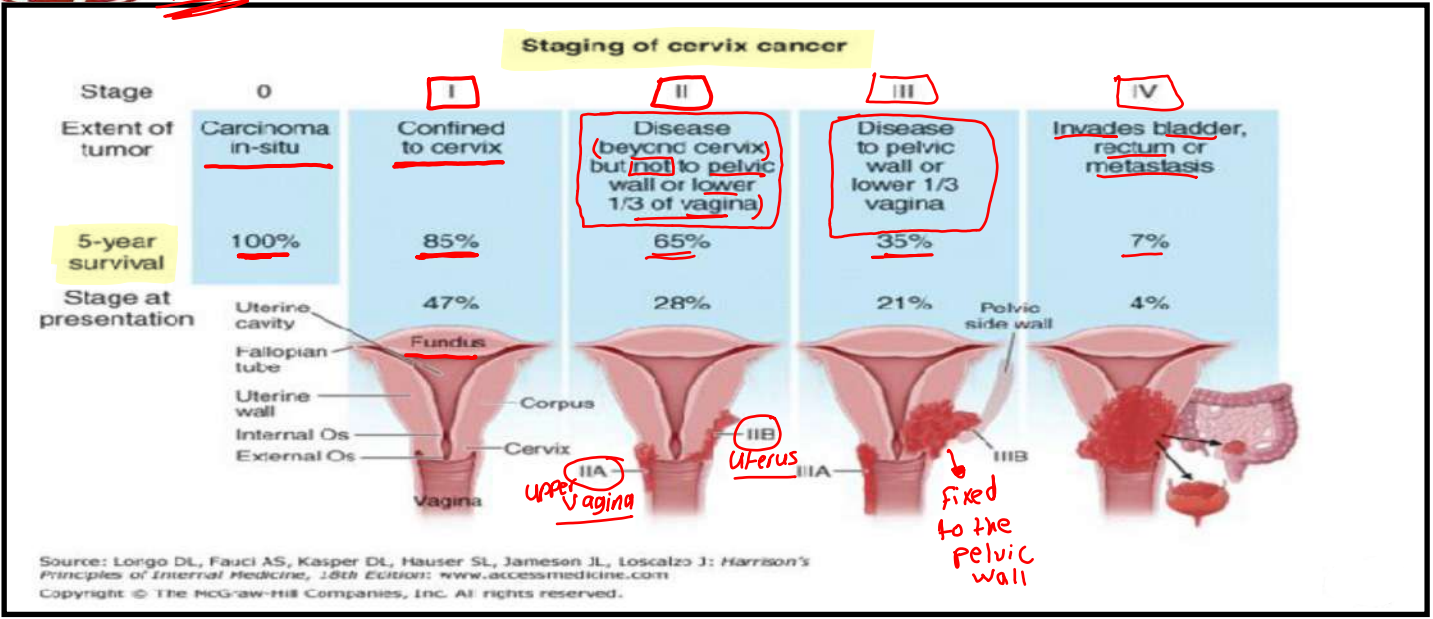
ALL cases presented with this considered cervical ca until proved otherwise

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# GENITOURINARY SYSTEM

vimp



Stage 2:  
NOT reach pelvic wall  
NOT reach lower 1/3 of vagina

Stage 2:  
NOT reach pelvic wall  
NOT reach lower 1/3 of vagina

• **CIN**: treatment by **laser or cone biopsy**

• **Invasive cancer**: surgical excision

✖ **Prognosis**: the 5-year survival is as follows: Stage 0 (preinvasive), **100%**; stage 1, **85%**; stage 2, **65%**; stage 3, **35%**; & stage 4, **7%**.

مش  
عنه

✖ **Prevention:**

- **HPV vaccine** can prevent the occurrence of cervical ca.
- **Detection of precursors by cytologic examination & their eradication by laser vaporization or cone biopsy is the most effective method of cancer prevention.**

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# GENITOURINARY SYSTEM

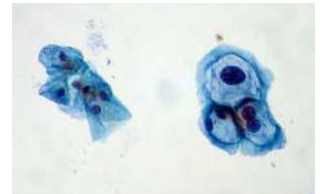
A researcher is studying the molecular mechanism through which HPV infection leads to cervical cancer. He has developed an in vitro model that involves transfecting cervical epithelial cells grown in culture flasks with a lentivirus carrying the HPV E6 and E7 genes. The expression of protein E6 and E7 in infected cells is subsequently confirmed using fluorescence microscopy. Which of the following best describes the role these proteins play in the pathogenesis of cervical cancer?

- A) Stabilization of mitochondrial membrane
- B) Inhibition of cell cycle regulatory proteins
- C) Inhibition of DNA repair proteins
- D) Overactivation of tyrosine kinase
- E) Overproduction of transcription factors

ANS:  
B

A 28-year-old woman comes to her outpatient provider's office for a wellness exam. She has no chronic medical conditions. The patient reports smoking half-a-pack of cigarettes daily, and she has been sexually active with multiple male partners in the last year. A speculum exam is performed, and a sample from the cervix transformation zone is collected. Subsequent visualization of the sample under microscopy is notable for the following findings. Which of the following pathogens is most likely responsible for this patient's finding?

- A) Human papillomavirus
- B) Neisseria gonorrhoeae
- C) Trichomonas vaginalis
- D) Gardnerella vaginalis
- E) Candida albicans



ANS:  
A

A 28-year-old woman comes to the office for a routine physical exam. The patient has no chronic medical conditions. The patient has had multiple sexual partners and takes oral contraceptives. She was previously uninsured and has not seen a physician for several years. Her temperature is 37.2°C (99.0°F), pulse is 67/min, and blood pressure is 123/71 mmHg. A Pap smear is performed and results are notable for high-grade squamous epithelial dysplasia. Subsequent colposcopy with biopsy confirms the presence of cervical intraepithelial neoplasia (CIN) grade II. Which of the following best describes the portion of the cervix that is affected in this patient?

- A) Basal 67% of epithelium
- B) Apical 33% of epithelium
- C) Near full-thickness epithelial involvement
- D) Basal 33% of epithelium
- E) Apical 67% of epithelium

ANS:  
A

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## GENITOURINARY SYSTEM

A 30-year-old woman comes to her primary care physician for an annual examination. The patient feels well and has no complaints. Over the past year, she has been sexually active with three male partners and does not use barrier contraception. A speculum exam is performed, and a specimen is collected using a cytobrush. Pap smear testing reveals cells with enlarged nuclei and perinuclear halos. Which of the following best describes the normal histology of the region of the cervix from where this sample was obtained?

- A. Columnar epithelial cells
- B. Cuboidal epithelial cells
- C. Transition from squamous to cuboidal epithelial cells
- D. Squamous epithelial cells
- E. Transition from squamous to columnar epithelial cells

ANS:  
E

A 46-year-old woman comes to the office because she has had abnormal vaginal bleeding for the past 6 months. Her most recent Pap test was 2 years ago and the results were within normal limits. Results of current Pap test show severe dysplasia, and colposcopy is planned. If the results of colposcopy continue to show severe dysplasia, which of the following is the most appropriate next step?

- A. Loop electrical excision procedure ( LEEP)
- B. Pelvic radiation therapy
- C. Radical trachelectomy
- D. Simple hysterectomy

ANS:  
A

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