
بسم الله الرحمن الرحیم
به‌نام خدای بخشاینده مهربان
In the name of Allah, the Beneficent, the Merciful.
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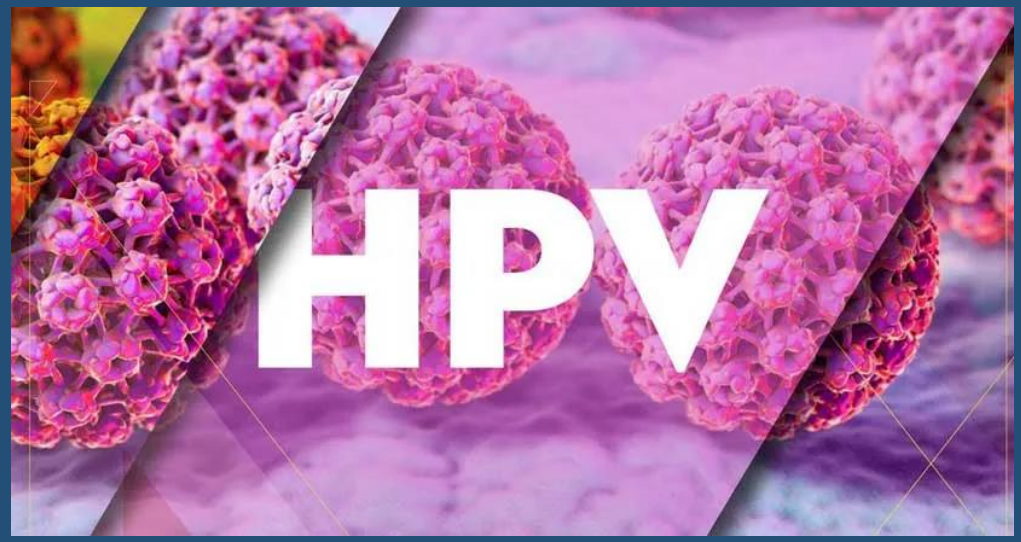
HPV Panel Discussion

Dr. Vaezi Maryam
Fellowship of Gyn. & Oncology
Tabriz University Of Medical Sciences, Nov.2025



Introducing the panel members

M.Vaezi-GYN.Oncologist-Tabriz University of Medical Sciences(Moderator)

B.Shokohi-Pathologist-Tabriz University of Medical Sciences

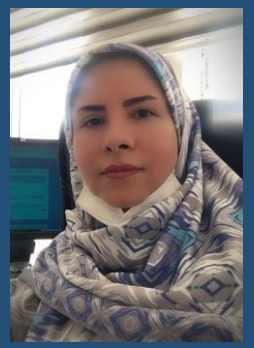
V.Rahmani-GYN.Oncologist-Tabriz University of Medical Sciences

R.Vejdani- GYN.Oncologist-Tabriz University of Medical Sciences

Sh.Yagoobi-GYN.Oncologist-Tabriz University of Medical Sciences







1. HPV testing (Female & Male) ?? FDA approve? PCR? HPV Rapid test? 2- Self cotrolled HPV Typing? 3- Age for HPV test? Reflex HPV Testing? Urine testing? Menstrual blood sampling?

Dr. Shokoohi

Examples of HPV tests used for cervical cancer screening

Commercial name	Approved indication(s)*	Assay target¶	DNA or RNA
Alinity m HR HPV[Δ]	Primary testing Co-testing Reflex testing	Group results of 11 high-risk HPV subtypes ([31, 33, 52, 58] and [35, 39, 51, 56, 58, 59, 66, 68]) and specifically reports on the presence or absence of HPV 16, 18, and 45	DNA
Aptima HPV[Δ] Aptima HPV 16 and 18/45[Δ]	Co-testing Reflex testing	Pooled detection of 14 high-risk HPV subtypes (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68) Specifically reports on the presence or absence of HPV 16 and 18/45	RNA
careHPV[◇]	Primary testing	Pooled detection of 14 high-risk HPV subtypes (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68)	DNA
Cervista HPV HR[Δ] Cervista HPV 16/18[Δ]	Co-testing Reflex testing	Pooled detection of 14 high-risk HPV subtypes (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68) Specifically reports on the presence or absence of HPV 16 and 18	DNA
Cobas HPV[Δ◇§]	Primary testing Co-testing Reflex testing Self-collection	Pooled detection of 12 high-risk HPV subtypes (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68) and specifically reports on the presence or absence of HPV 16 and 18	DNA
digene Hybrid Capture 2 (HC2)[Δ]	Co-testing Reflex testing	Pooled detection of 13 high-risk HPV subtypes (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, and 68)	DNA
Onclarity HPV[Δ§]	Primary testing Co-testing Reflex testing Self-collection	Specifically reports on the presence or absence of 14 high-risk HPV subtypes (individual results for 6 HPV subtypes [16, 18, 31, 45, 51, and 52] and grouped results for the remaining subtypes [33/58, 35/39/68, and 56/59/66])	DNA
Xpert HPV[◇]	Primary testing	Pooled detection of 11 high-risk HPV subtypes (31, 33, 35, 39, 51, 52, 56, 58, 59, 66, and 68) and specifically reports on the presence or absence of HPV 16 and 18/45	DNA

Examples of HPV tests used for cervical cancer screening

- Definitions of approved indications:

- **Primary testing**: HPV testing is performed alone, without cervical cytology.
- **Co-testing**: HPV and cytology testing are collected, and results are provided concurrently.
- **Reflex testing**: HPV testing is performed automatically on a sample when the cytology result returns positive for atypical squamous cells of undetermined significance.
- **Self-collection**: When access to a speculum examination is limited or for those who are reluctant to undergo a pelvic examination, self-collected samples may be used for selected HPV tests.

Contribution of carcinogenic HPV genotypes and CIN 3+ progression risk for progression to CIN grade 3 or worse??

Dr. Shokoohi

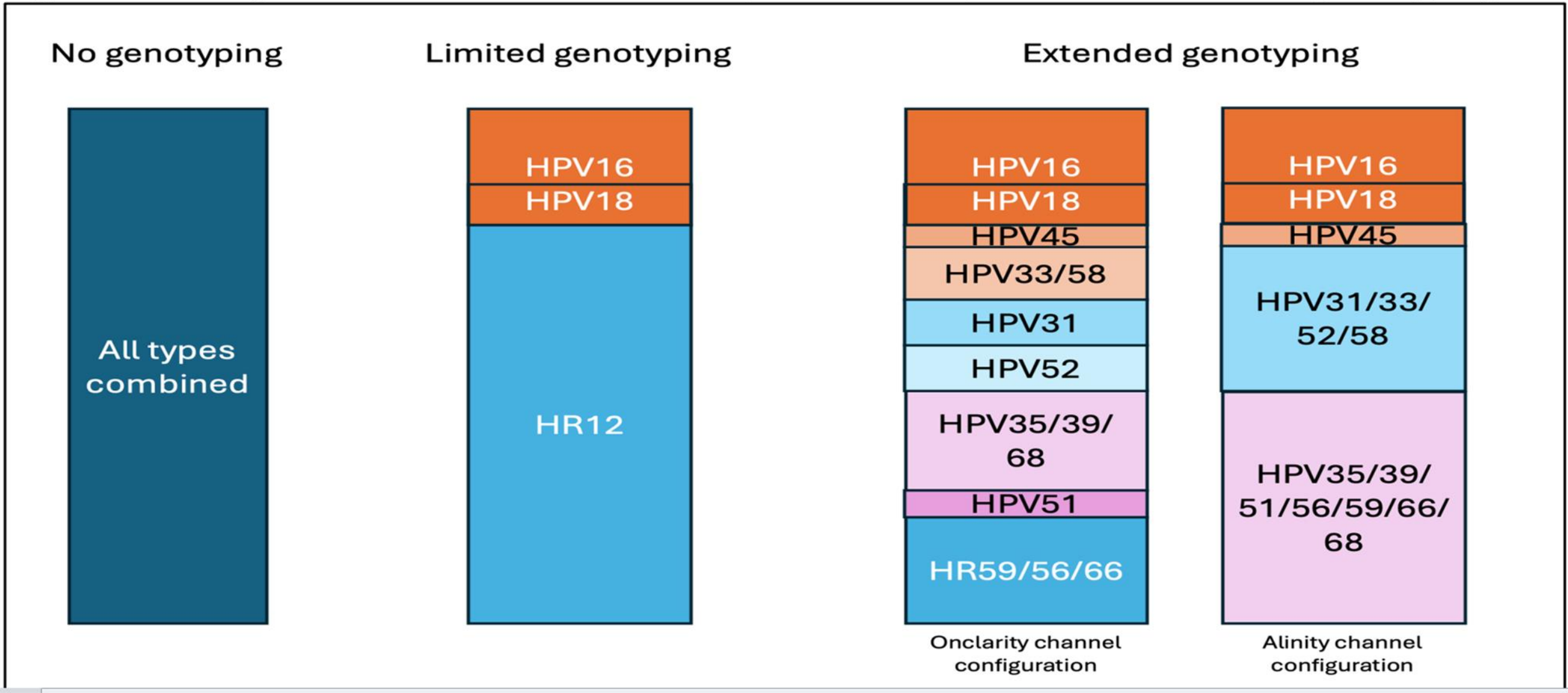
Contribution of carcinogenic HPV genotypes and CIN 3+ progression risk for progression to CIN 3 or worse

Carcinogenic HPV type	Percent of cervical cancers	9-year risk of progression to CIN3+ of incident HPV infection	Risk group
16	60.3	6.3	16
18	10.5	3.0	18/45
45	6.1	2.2	18/45
33	3.7	4.5	16-related
31	3.6	2.2	16-related
52	2.7	2.2	16-related
58	2.2	1.9	16-related
35	2.0	2.8	16-related
39	1.6	1.1	Other
51	1.2	1.1	Other
59	1.1	0.9	Other
56	0.9	0.8	Other
68	0.6	1.0	Other

This table summarizes the proportion of cancers caused by 13 HPV types and the risk of progression from infection to CIN 3+.

UpToDate contributors note that other subtypes of HPV (eg, HPV 82) may also contribute to cervical cancers, but these subtypes are rare.

Figure 1: Configuration of HPV tests without, with limited, and with extended genotyping



عفونت های همزمان چه اثری بر HPV دارند؟

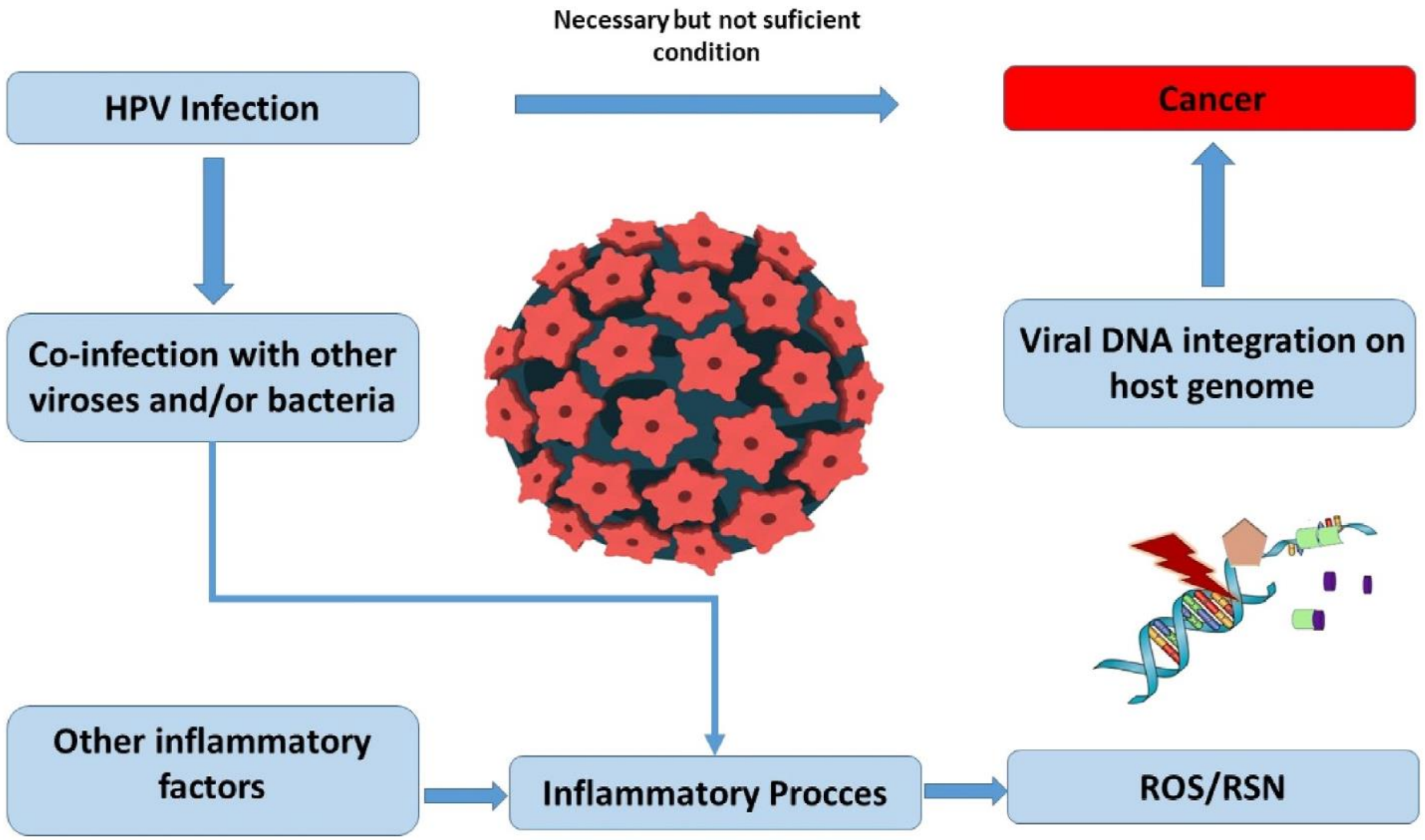
Dr. Yaghoobi

عفونت های همزمان چه اثری بر HPV دارند؟

- **HIV:** This is the most significant co-infection. HIV weakens the immune system, making individuals more susceptible to persistent, high-risk HPV infections and accelerating the development of HPV-related cancers like cervical and anal cancer. In 2018, nearly 5% of all global cervical cancer cases were attributable to HIV.
- **Other Viruses:** Co-infections with Herpes Simplex Virus (HSV), Hepatitis B and C (HBV, HCV), Epstein-Barr Virus (EBV), Cytomegalovirus (CMV), and Human T-cell Lymphotropic Virus (HTLV-1) have also been observed. These can complicate diagnosis, management, and may increase the risk of certain cancers.

- **Clinical Importance:**
  Co-infection can alter the clinical course of HPV, affect treatment outcomes, and influence transmission. Therefore, it is crucial to screen and manage individuals with HPV for other viral infections, especially if they have risk factors or belong to high-prevalence groups.

Role of chronic inflammation in HPV-carcinogenesis



عفونت های باکتریال همزمان چه اثری بر HPV دارند؟

- **Chlamydia trachomatis and Mycoplasma genitalium**: Co-infection with these STI bacteria may enhance the **persistence of HPV and increase the risk of complications like cervical dysplasia and cancer.**
- **Bacterial Vaginosis (BV)**: This imbalance in vaginal flora is **associated** with **high-risk HPV types**. BV may **create a favorable environment for HPV to persist and progress.**
- **Other Bacteria**: Associations have also been noted with Group B Streptococcus, Neisseria gonorrhoeae, and Haemophilus ducreyi, though the clinical significance is **less established.**
- **Overall Implication:**
- The presence of these bacterial infections can impact the clinical course, progression, and treatment outcomes of HPV-related diseases.

- وقتی ویروس HPV وارد بدن انسان می شود چه اتفاقی می افتد؟

Dr Vejdani

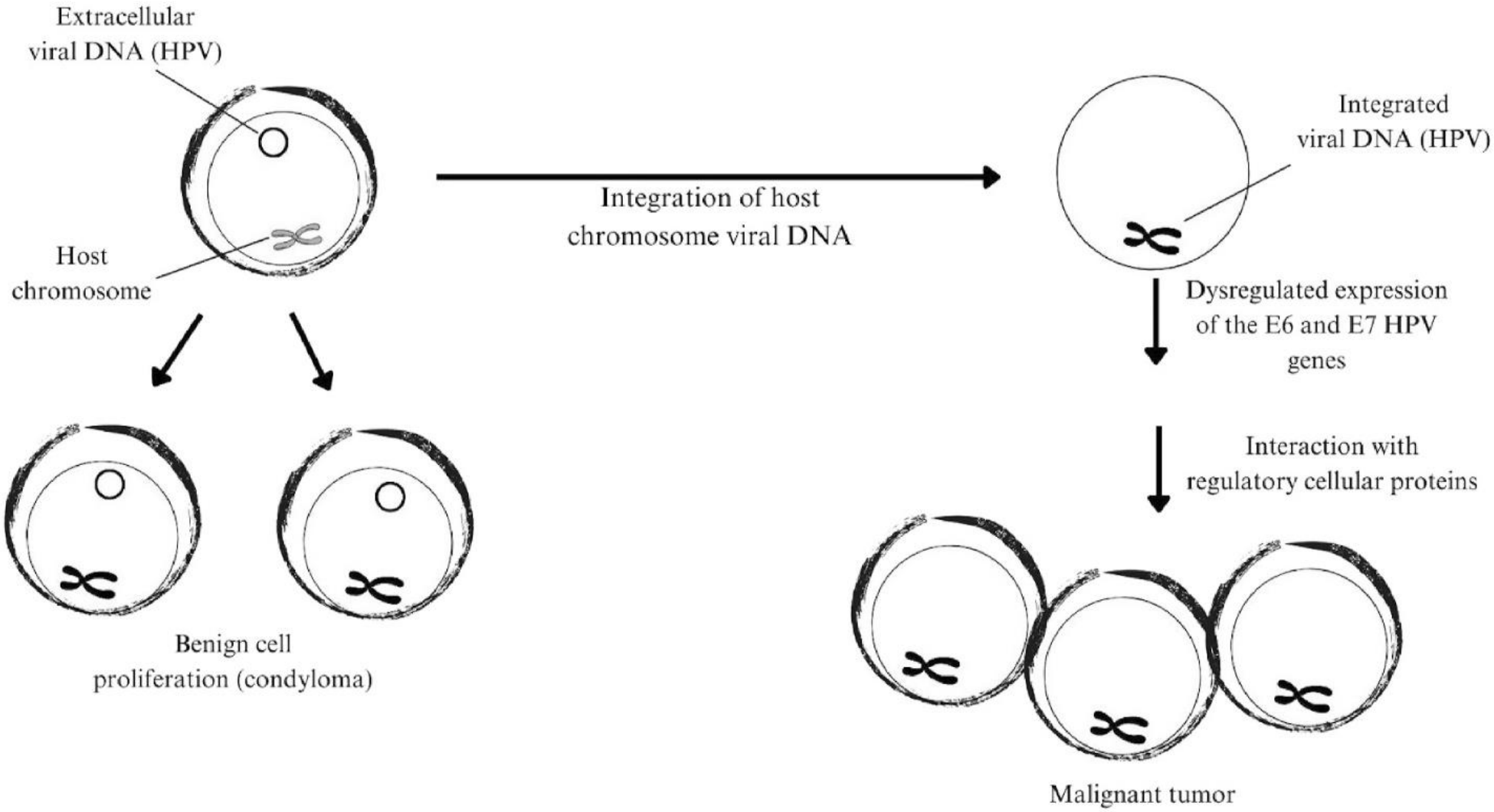
Clinical scenarios following acute HPV infection

- **Latent infection** without **physical, cytologic, or histologic manifestations. (over 90%)**.
- **Active infection** in which HPV undergoes vegetative replication, but **not integration into the genome.Actively replicating HPV** produces characteristic cellular changes such as nuclear enlargement, **multinucleation, hyperchromasia, and perinuclear cytoplasmic clearing (halos)** . On average, these changes occur **2-8 months after the patient is first infected.**

Clinical scenarios following acute HPV infection

- **The cytologic findings** are also the cytologic characteristics of **LSIL and ASC-US**; thus, LSIL and HPV-positive ASC-US can be considered cytologic manifestations of active HPV infection.
- **Neoplastic transformation** in which **HPV integrates into the human genome**. Possible clinical manifestations of this state include **high-grade lesions and cancer**. This process occurs **years after the acute infection**.

Mechanism of interaction and replication of viral DNA integrated into the host



HPV Infection During Pregnancy??

DR Yaghoobi

Maryam Vaezi

HPV Infection During Pregnancy: International Journal of Gynecological Cancer 2025

- **Introduction & Objective:**

  This study aimed to determine the prevalence of HPV in a young pregnant population at a single center in Turkey, where routine cervical cancer screening typically starts at age 30, which is older than the average pregnancy age.

- **Methodology:**

  The researchers screened 312 pregnant women during their first prenatal visit, without an age limit, for HPV and cervical lesions.

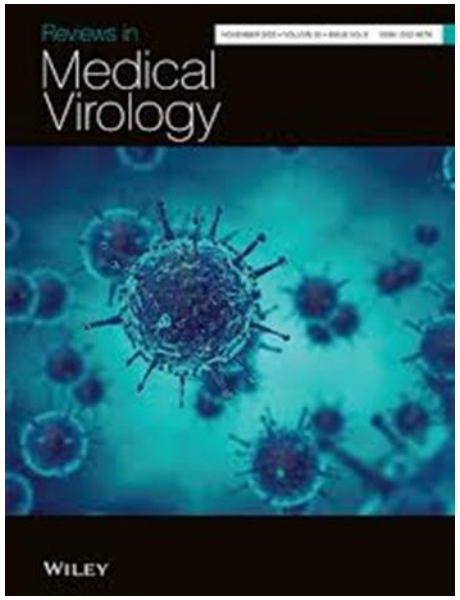
HPV Infection During Pregnancy: International Journal of Gynecological Cancer 2025

- **The HPV prevalence was 8.04% in the study's pregnant** population, which is higher than the reported national average of 4.39% for the general population in Turkey. The authors suggest this is because their study group was younger.
- Among the 25 HPV-positive women, a variety of types were detected, with "other" types (not 16, 18, or 31) being the most common (64%).
- A small number of women (7) had abnormal cervical cytology (ASCUS or LSIL).
- **Crucially, HPV positivity did not statistically change pregnancy outcomes.**
- **Conclusion:**

  The study confirmed a higher HPV prevalence in its young pregnant cohort. **The finding that HPV did not affect pregnancy outcomes** needs to be verified with a larger sample size, which is the goal for their future research.
-

HPV Infection During Pregnancy:2024

- **Pregnancy:** HPV infection is more likely to be acquired and progress during pregnancy, with prevalence rates ranging from **16% to 82%**.
- The most frequent types in pregnant women are **HPV-16, HPV-6, HPV-18, and HPV-11.**



Therapeutic papillomavirus vaccine??

Dr.Rahmani

Advancements in mRNA Vaccines: Cancer control j.2024

- It highlights a key advancement in treatment: **the potential of mRNA vaccines**. Unlike preventive HPV vaccines, these new mRNA vaccines are being developed as a *therapeutic* tool to fight existing HPV-related cancers.
- The summary of the advancements is as follows:
- **Mechanism: They work by stimulating the immune system to target specific proteins on virus-infected or tumor cells.**
- **Promise:** Early results are encouraging, showing efficacy in animal studies and demonstrating positive outcomes in clinical trials for head and neck cancers when combined with immunotherapy drugs.
- **Future:** While challenges like stability and immunogenicity remain, mRNA technology holds significant promise for creating new, effective treatments for HPV-related malignancies.
-

Advancements in mRNA Vaccines: A Promising Approach for Combating Human Papillomavirus-Related Cancers

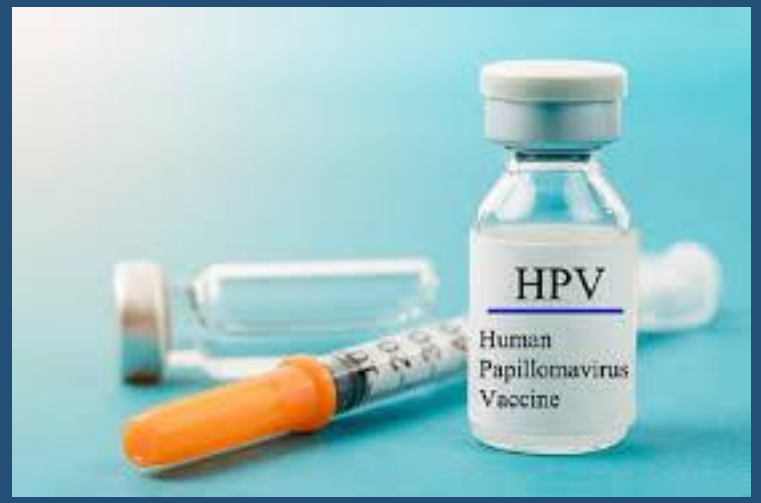
Laraib Iqbal[1], Minal Jehan[1], and Sumran Azam[1]

Prophylactic HPV vaccination in HPV-related gynecologic cancers?

Dr.Rahmani

Prophylactic HPV vaccination in HPV-related gynecologic cancers:
ESGO 2024

- There is a common clinical practice of administering the prophylactic HPV vaccine to patients at the time of or after treatment for HPV-related gynecologic cancers (like cervical, vaginal, and vulvar cancer). However, a review of the literature finds no direct evidence to support this specific use.
- **Lack of Evidence:** While the rationale is based on the vaccine's success in preventing pre-invasive disease, there are currently no studies proving it reduces the risk of future HPV-related diseases in women who have already been diagnosed with such a cancer.
- Official Stance: ESGO states that there is no evidence to support this practice. Their **recommendation is to counsel these patients the same as any other patient, suggesting vaccination based on age and prognosis, while acknowledging that vaccine efficacy decreases with age.**
- Conclusion: **The authors strongly recommend that studies are needed to investigate the potential benefits of the HPV vaccine in this specific patient population.**



واکسن در چه شرایطی بیشترین تاثیر را دارد؟

Dr. Vejdani

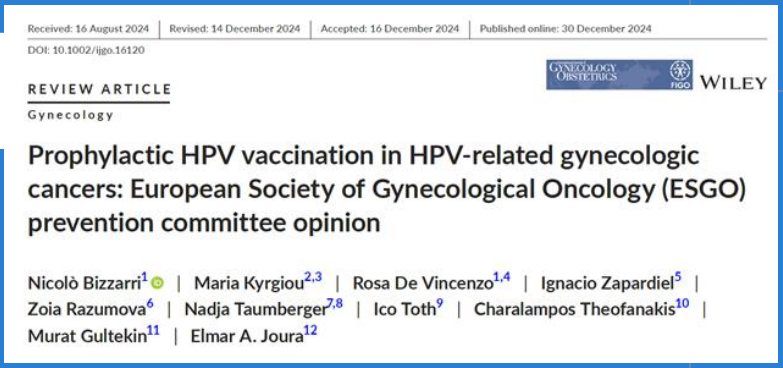
HPV vaccine: Age and Efficacy

- **Age and Efficacy**: While there is no upper age limit for the vaccine in Europe, its efficacy is **highest** when administered at a younger age **(ideally 12-13 years).** However, **vaccination is still recommended for older individuals within the approved age ranges, acknowledging that protection may be lower.**

HPV vaccine after treatment for pre-cancerous conditions (CIN)??

Dr. Yaghoobi

HPV vaccine after treatment for CIN



Received: 16 August 2024 | Revised: 14 December 2024 | Accepted: 16 December 2024 | Published online: 30 December 2024
DOI: 10.1002/ijgo.16120

REVIEW ARTICLE
Gynecology

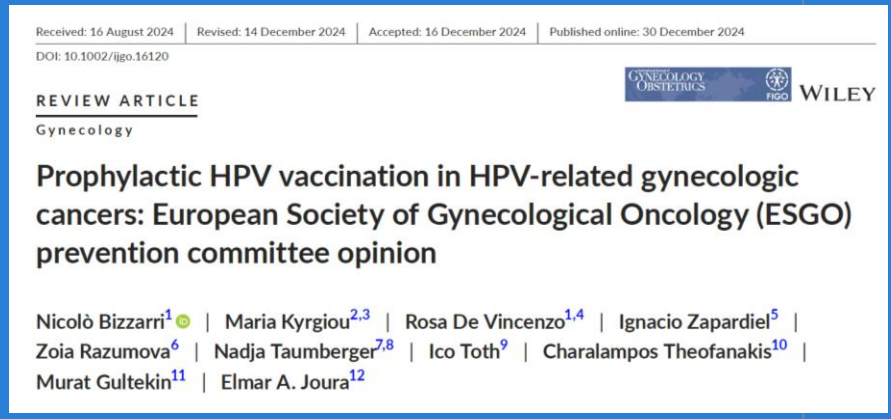
Prophylactic HPV vaccination in HPV-related gynecologic cancers: European Society of Gynecological Oncology (ESGO) prevention committee opinion

Nicolò Bizzarri[1] | Maria Kyrgiou[2,3] | Rosa De Vincenzo[1,4] | Ignacio Zapardiel[5] | Zoia Razumova[6] | Nadja Taumberger[7,8] | Ico Toth[9] | Charalampos Theofanakis[10] | Murat Gultekin[11] | Elmar A. Joura[12]

- There is growing evidence that administering the HPV
- vaccine **after treatment** for pre-cancerous conditions like CIN **can be beneficial as a secondary prevention measure.**
- **Key Points:**
- **Proven Benefit:** Multiple studies and a meta-analysis show that adjuvant HPV vaccination after surgical treatment (like conization) can **reduce the risk of recurrent disease (CIN2+) by approximately 60%.**
- **Rationale:** Even after exposure to HPV, the vaccine **can protect against other HPV types and may prevent re-infection or reactivation. Surgery can create a "HPV-naïve" environment where the vaccine-induced immunity can be more effective.**

HPV vaccine after treatment for CIN

- **Broader Application:** This benefit is also observed for reducing recurrent high-grade lesions of the vulva and anus.
- **Timing and Ongoing Research:** While starting vaccination close to the time of surgery seems beneficial, the optimal timing is not definitively established. Several major clinical trials (like the NOVEL trial and the HOPE9 study) are ongoing to provide further evidence.
- **Conclusion:** Vaccinating individuals after treatment for pre-invasive HPV disease is a promising and cost-effective strategy to **prevent recurrences, reinforcing the value of vaccination even after HPV exposure.**



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Is there a role for prophylactic HPV Vaccines after diagnosis of cervical carcinoma?

Dr. Vejdani

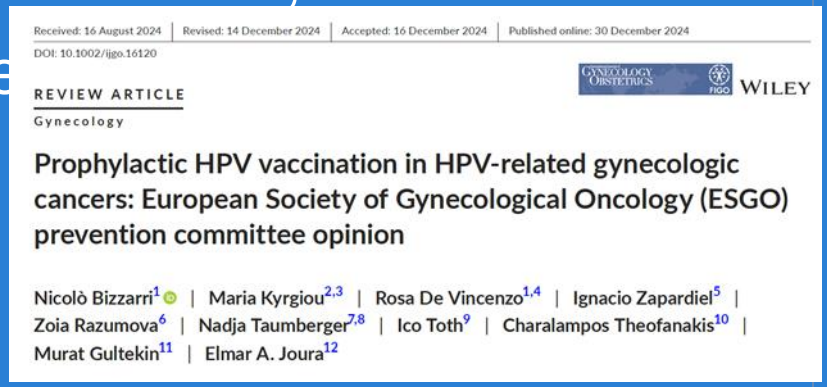
HPV Vaccines after diagnosis of cervical carcinoma, ESGO 2024

- **There is no direct evidence from the literature on the effectiveness of prophylactic HPV vaccination for patients *after a diagnosis of invasive cervical cancer*.** However, some clinicians advise it based on extrapolation from other settings.
- **Key Points and Rationale: Lack of Direct Evidence:** No studies have specifically tested if the vaccine prevents recurrence in women with a prior invasive cervical cancer diagnosis.
- **Proof-of-Concept from Related Studies:** A retrospective study suggested a *potential* benefit, estimating that vaccination could have been protected in about 67% of cases of subsequent genital tract dysplasia in cervical cancer survivors. However, this is not conclusive evidence.
- **Theoretical Benefits:** The main rationale for vaccination in these patients is to **protect them from other HPV-related diseases in other sites (like vaginal, vulvar, or anal cancer), as they remain at risk.**

HPV Vaccines after diagnosis of cervical carcinoma

- **Safety and Existing Practice:** The vaccine's safety profile is favorable, and some national programs (e.g., in Italy, Canada, Brazil) already reimburse vaccination for women treated for invasive cancer.
- **Age Considerations:** **While most effective in younger individuals, the vaccine is immunogenic and can provide protection at least up to the age of 45-55 years.**
- **Conclusion:**

  The use of the HPV vaccine in cervical cancer survivors is a **theoretical and precautionary measure** supported by indirect evidence, with the primary aim of preventing new HPV-related disease sites.
- Higher-quality evidence from prospective trials is needed.



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Gynecology
GYNECOLOGY OBSTETRICS FIGO WILEY

Prophylactic HPV vaccination in HPV-related gynecologic cancers: European Society of Gynecological Oncology (ESGO) prevention committee opinion

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Should we offer prophylactic HPV vaccines in patients with other HPV-related gynecologic cancers?

Dr. Yaghoobi

HPV vaccines in other HPV-related gynecologic cancers

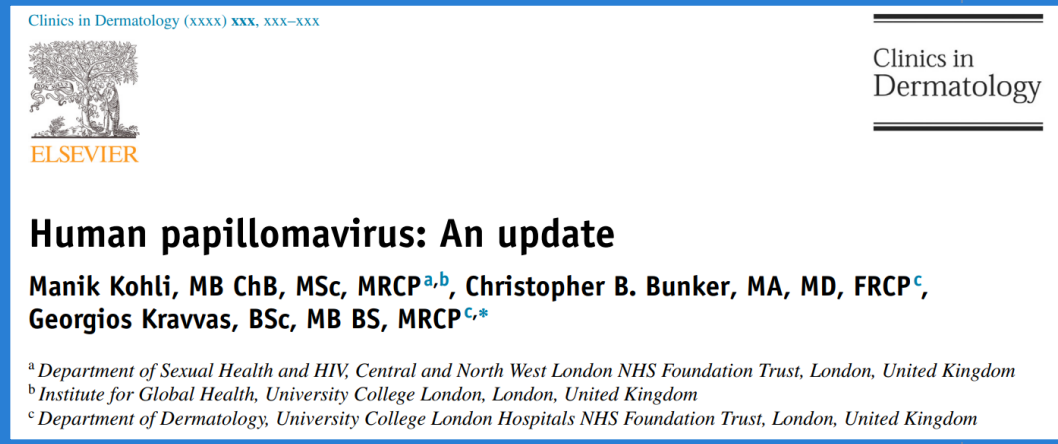
- For patients with other HPV-related gynecologic cancers, such as **vulvar and vaginal cancer**, the situation is similar to that of cervical cancer.
- **Key Points:**
- **Lack of Evidence:** There is no available evidence demonstrating that HPV vaccination prevents cancer recurrence in women who have been treated for **invasive** vulvar or vaginal cancer. Data is also scarce for its use after pre-invasive lesions.
- **Shared Risk:** These patients carry a similar risk of HPV persistence or recurrence as cervical cancer patients.
- **Clinical Opportunity:** Despite the uncertainty, a cancer diagnosis presents a key opportunity for gynecologic oncologists to counsel their patients about the **potential benefits and the current lack of evidence** regarding HPV vaccination in their situation.
-

ویروس HPV
چه مدتی در بدن باقی می ماند؟

Dr. Vejdani

HPV Clearance/Persistence: 2025

- In most patients, HPV infection remains subclinical and is thought to clear spontaneously **within two years.**
- In a significant minority (up to 20%), HPV infection may persist with significant clinicopathologic consequences.
- **Increasing evidence supports the argument that HPV infection may never be completely cleared at the molecular level.**



Clinics in Dermatology (xxxx) xxx, xxx–xxx

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Clinics in Dermatology

Human papillomavirus: An update

Manik Kohli, MB ChB, MSc, MRCP[a,b], Christopher B. Bunker, MA, MD, FRCP[c], Georgios Kravvas, BSc, MB BS, MRCP[c,*]

[a] *Department of Sexual Health and HIV, Central and North West London NHS Foundation Trust, London, United Kingdom*
[b] *Institute for Global Health, University College London, London, United Kingdom*
[c] *Department of Dermatology, University College London Hospitals NHS Foundation Trust, London, United Kingdom*

HPV Clearance/Persistence:

- **Prevalence:** HPV is common in heterosexual men, who can be asymptomatic carriers and unknowingly transmit the virus to female partners.
- **Clearance/Persistence:** Genital HPV infections generally clear faster in men (median of ~5.9 months) than in women. However, persistence varies by strain and body site:
  - **Oral HPV:** HPV-16 and HPV-33 can persist for over 6 months.
  - **Anal HPV:** In HIV-negative men who have sex with men (MSM), HPV-16 can persist for a median of 6.9 months, with over a third of high-risk infections lasting 24 months or longer.
  - **Penile vs. Seminal HPV:** Infections persist longer in penile samples (median 22.5 months) than in seminal samples (median 15.3 months), with oncogenic types showing greater persistence.
- **Influencing Factors:** Beyond age and number of partners, factors like genetics, lifestyle (diet, alcohol, sleep), and chronic stress can impact immune function and the duration of HPV infection.
- **Transmission Dynamics:** Men clear both high-risk and low-risk HPV types at similar rates, whereas women have slower clearance rates for high-risk (oncogenic) types and a higher probability of acquiring them.

ویروس HPV
چه مدتی روی سطوح باقی می ماند؟

Maryam Vaezi

Dr. Vejdani

Survival of the virus on surfaces

- HPV type 16 remains **infectious for 7 days** on wet surfaces.
- HPV is **resistant to heat and drying**, retaining **~30% infectivity after 7 days of dehydration.**

مدت زمان محافظت پس از واکسیناسیون ؟؟

Dr. Rahmani

The duration of protection after vaccination

- The duration of protection after vaccination is not entirely known, but some trials have suggested **8-9 years at the minimum.**
- **Seropositive persons** produce **higher antibodies in response** to the HPV vaccine, so **subsequent exposure** after vaccination could serve as a booster to ***prolong the protection***.

- Non-sexual HPV transmission and role of vaccination for a better future (Review)
- Authors: Aida PetcaAndreea BorislavschiMona Elena ZvancaRazvan-Cosmin PetcaFlorica SandruMihai Cristian Dumitrascu, Published online on: October 13, 2020 https://doi.org/10.3892/etm.2020.9316

آیا زنان بیشتر عفونت را منتقل می کنند یا مردان؟؟؟

Dr Vejdani

- HPV is primarily transmitted through sexual contact, with males serving as both carriers and vectors of the virus. Interestingly, **women have a higher likelihood of transmitting HPV to their male partners** than the reverse, due to factors such as anatomical differences, higher viral shedding from the cervix and vagina, and the persistence of infections in women .

HPV and Male Cancer: Pathogenesis, Prevention and Impact

by **Soumendu Patra** [1], **Harshita Shand** [1], **Sayan Ghosal** [1] and **Suvankar Ghorai** [1,2,*]

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[2] Department of Cellular and Molecular Medicine, Herbert Wertheim College of Medicine, Florida International University, 11200 SW 8th Street, Miami, FL 33199, USA
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دیدگاه سازمان بهداشت جهانی به واکسیناسیون HPV ؟؟

Dr.Rahmani

WHO Recommendation

- WHO which released a recent position paper recommending that **HPV vaccines should be included in all national immunization programs** an should reach a **coverage of 90% of all girls by the age of 15 by 2030**.
- WHO stated that **prevention of cervical cancer** is best achieved through the immunization with HPV vaccines of girls and boys before they become sexually active, as they have excellentsafety profiles, and they are highly efficacious.

World Health Organization

90%
Vaccination

90% of girls fully vaccinated with the human papillomavirus (HPV) vaccine by age 15.

70%
Screening

70% of women screened with a high-performance test (such as the HPV test) by age 35, and again by 45 years.

90%
Treatment

90% of women identified with cervical precancer or cervical cancer receive adequate treatment and care.

World Health Organization

پیشگیری از HPV

Dr.Rahmani

پیشگیری از HPV ?

- The core message highlights a three-pronged approach to prevention and management:
- **Vaccination:** Stressed as highly effective and ideally administered before sexual debut.
- **Safe Sexual Practices:** Including condom use and limiting partners to reduce transmission.
- **Early Detection:** Underscoring the vital role of regular screening (like cervical cancer programs) to identify and treat precancerous lesions early.
- The conclusion calls for comprehensive public health efforts **focused on education, awareness, and improving access to vaccination** and screening to **significantly reduce the burden of HPV-related diseases.**

What should we do?

Male engagement is a crucial strategy for improving women's health in LMICs. Success requires a collaborative approach that combines education, community involvement, and supportive policies to overcome entrenched gender norms.

NEXT Session: All about HPV

1. Anogenital Warts
2. HPV & Anal cancer in male-female
3. Terapeutic Vaccines
4. HNscc
5. Vaccine in HPV related cancers
6. HPV & other STI
7. Cervical cancer Screening & HPV typing role

TO BE CONTINUED...