



Virology for 2nd Year MD Students

(06) DNA viruses: ***Papillomaviridae*** ***Polyomaviridae***

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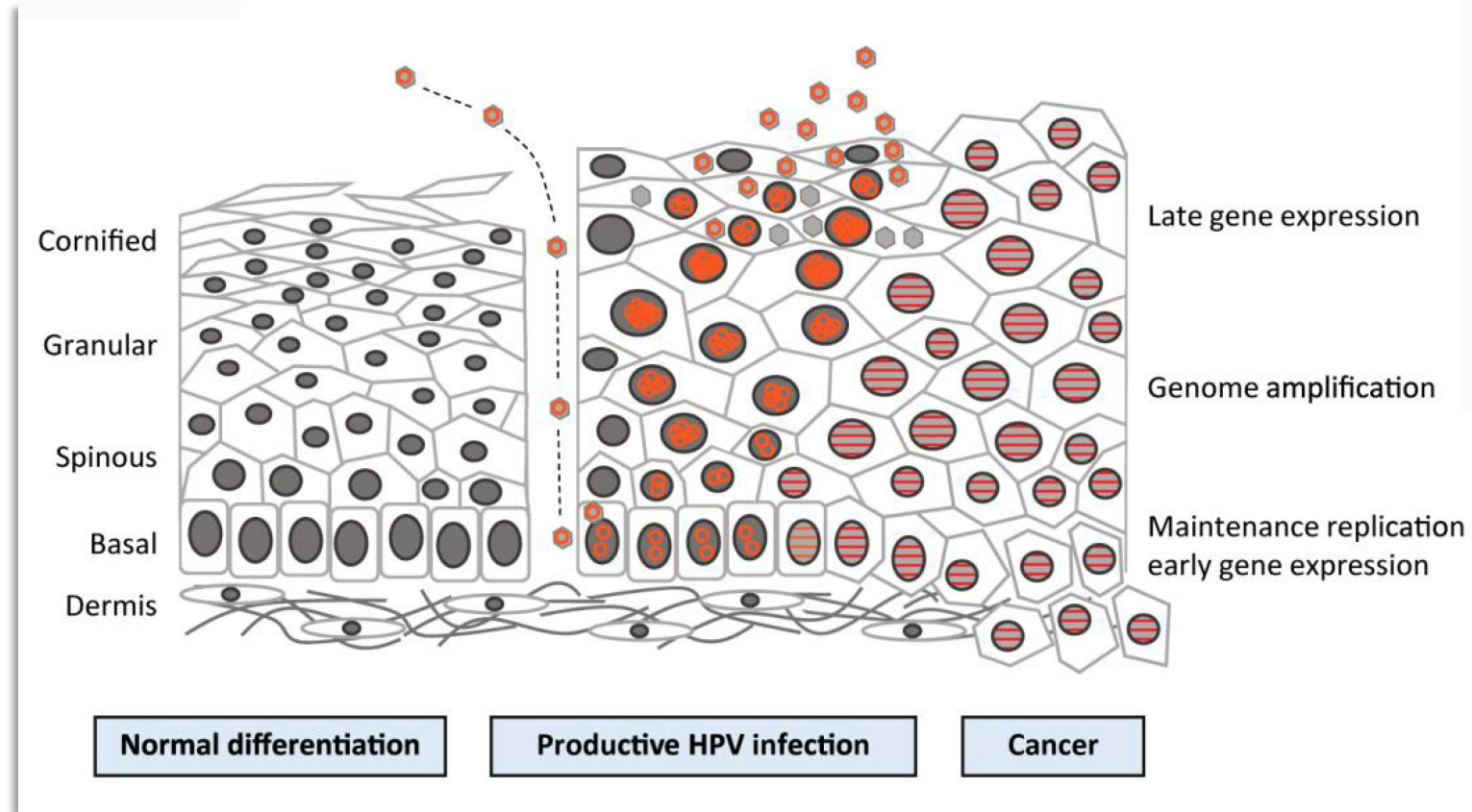
Papillomaviridae

Human papillomavirus (HPV)

dsDNA, non-enveloped viruses that replicate in the nucleus. The virus has many types (>200).

Transmission: direct contact, sexual.

Tropism: epithelial cells of the skin and mucous membranes.





HPV Important features

1. HPV is the most common cause of sexually transmitted infections worldwide.
2. Most HPV infections resolve spontaneously within 2-3 years.
3. Many infections are totally asymptomatic, so the patient can have HPV without knowing
4. Some HPV types are benign, some have low-risk of causing cancer and some are high-risk types that can cause the following cancers: cervical, penile, anal, oropharyngeal, and vulvar cancers.
5. High-risk HPV types have transforming proteins that are related to cancer development.



HPV Clinical Features

Common warts

Condyloma acuminata (genital warts) caused mainly by HPV-6 and HPV-11

Laryngeal papilloma.

Cervical cancer caused mainly by HPV-16 and HPV-18

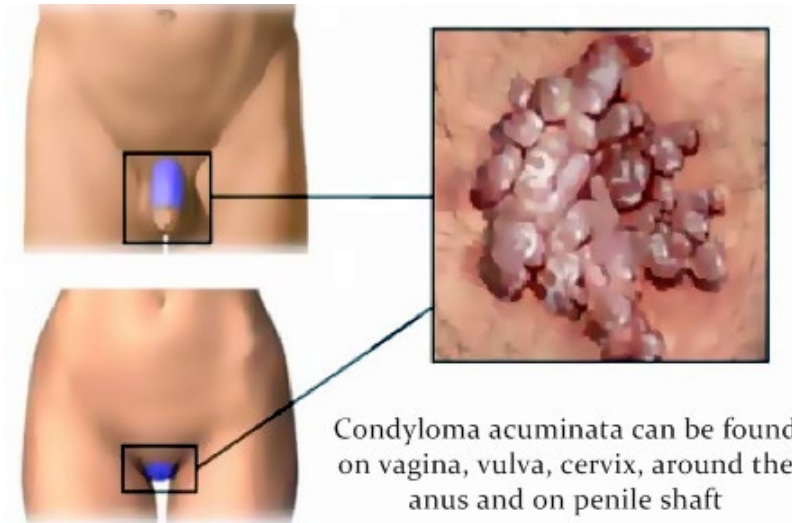
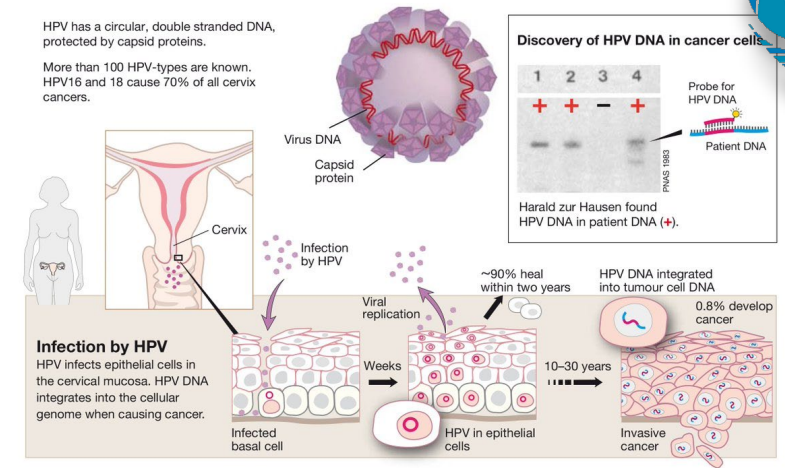
Other cancers: **penile, anal, oropharyngeal, and vulvar cancers.**

Caused by high-risk HPV types (e.g., HPV-16 and HPV-18)

HPV – human papilloma virus

HPV has a circular, double stranded DNA, protected by capsid proteins.

More than 100 HPV-types are known. HPV16 and 18 cause 70% of all cervix cancers.





HPV Clinical Features





HPV diagnosis and management

Diagnosis:

A.Clinical.

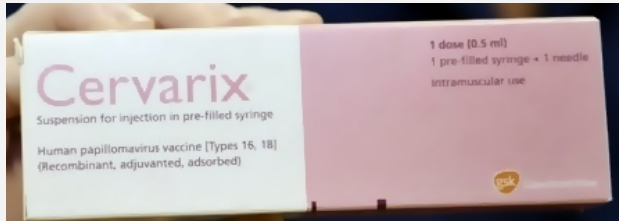
B.Pap smear (Papanicolaou smear is a cytology method of cervical screening to look for precancerous lesions in the cervix).

C.PCR.

Treatment: Most do not require treatment. Other methods: surgical excision, laser therapy, chemical agents (e.g., podophyllotoxin and podophyllin, imiquimod).



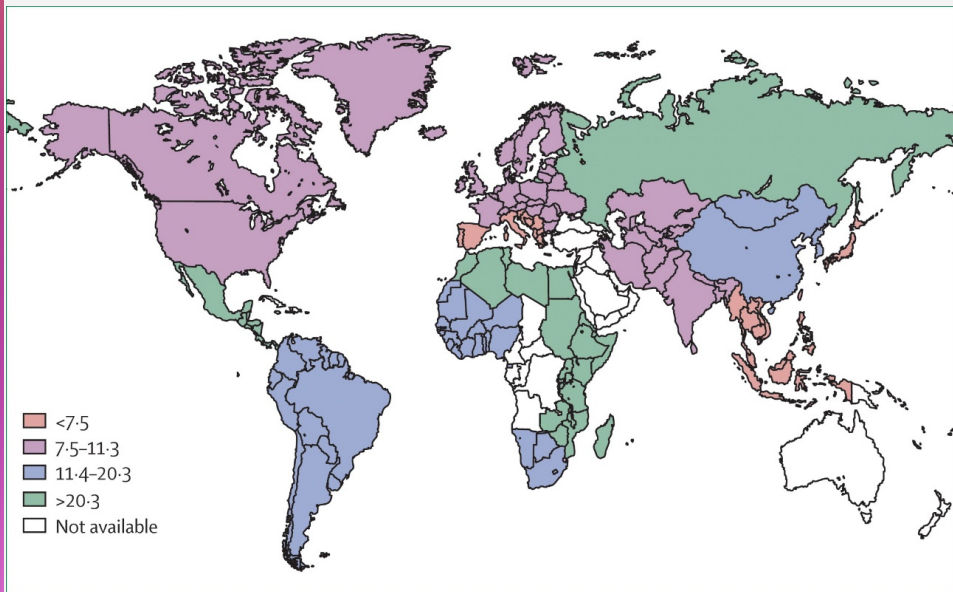
HPV epidemiology and prevention



Prevention: Subunit vaccines:

1. Cervarix (bivalent vaccine for HPV-16 and 18).
2. Gardasil (quadrivalent vaccine for HPV-6, HPV-11, HPV-16, and HPV-18).
3. Nonavalent vaccine (for the following types: 6, 11, 16, 18, 31, 33, 45, 52, 58).

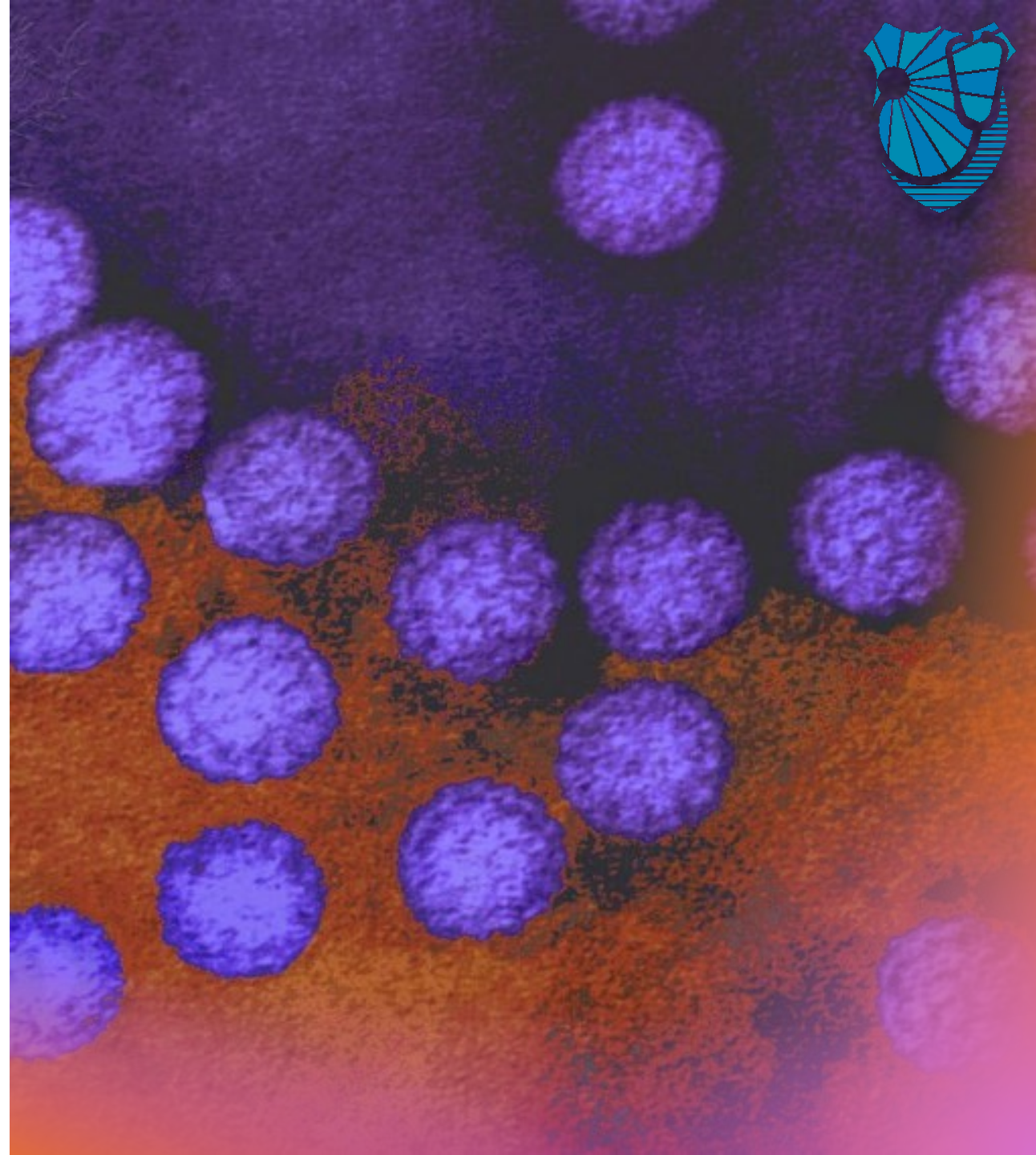
Epidemiology: The global HPV prevalence is about 10%.





Polyomaviridae

- Double-stranded DNA, non-enveloped viruses that replicate in the nucleus
- **JC virus, BK virus and Merkel cell polyomavirus**
- **Most of these infection remain latent in the body without symptoms.**
- **Transmission:** not established





Polyomaviridae

Clinical features:

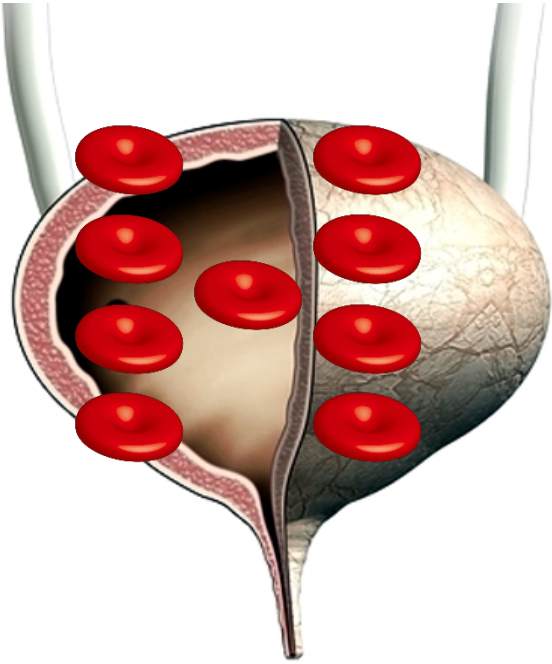
A.BK virus: cystitis in bone marrow transplant patients

B.JC virus: progressive multifocal leukoencephalopathy (PML) in AIDS patients.

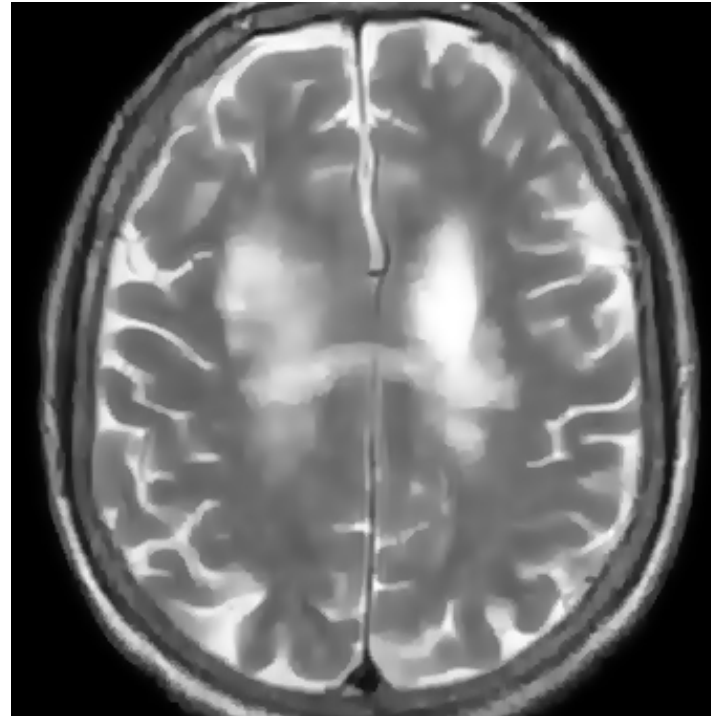
C.Merkel cell polyomavirus: Merkel cell carcinoma (rare skin cancer). So, Merkel cell polyomavirus is an oncovirus



Polyomaviridae



BK virus: Hemorrhagic
cystitis



JC virus: Progressive
multifocal
leukoencephalopathy
(PML)



MCPyV: Merkel cell
carcinoma



Polyomaviridae

Diagnosis:

A.PCR

B.Radiology

C.Histopathologic examination

Treatment: No specific treatment.

Prevention: Vaccines have not been approved for prevention so far.

Epidemiology: Widely spread. A majority of humans have the infection by BK and JC viruses.



Thank You...
Wishing you all the best!
