



UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

CORSO DI IGIENE

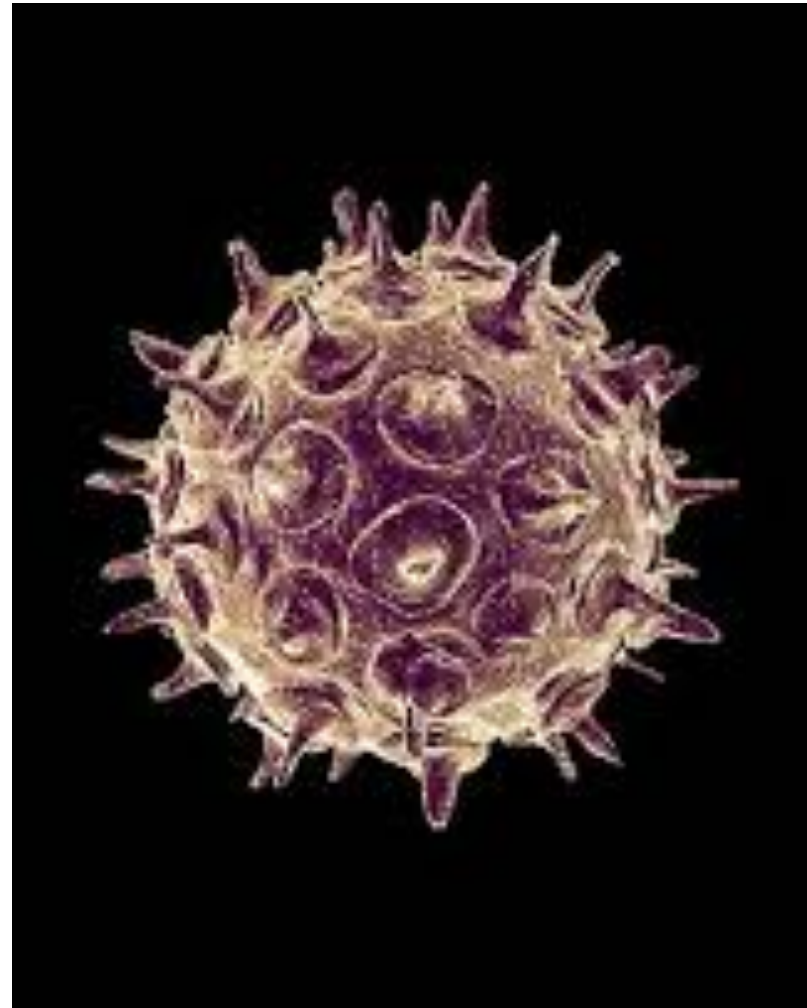
**Scuola
di
Medicina**

Varicella



Varicella Zoster Virus (VZV)

- Herpesvirus (DNA)
- Primary infection results in varicella (chickenpox)
- Reactivation of latent infection results in herpes zoster (shingles)
- Short survival in environment



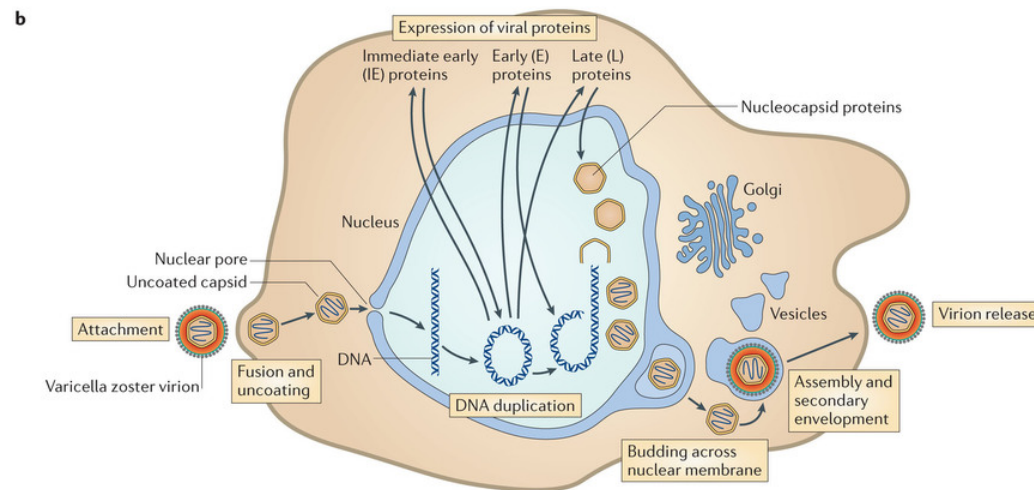
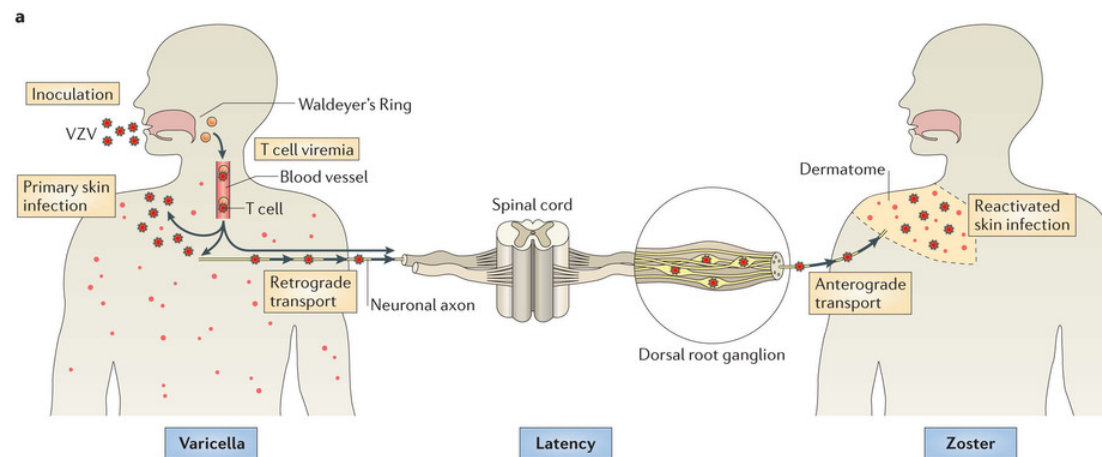


Varicella Pathogenesis

- Respiratory transmission of virus
- Replication in nasopharynx and regional lymph nodes
- Primary viremia 4 to 6 days after infection
- Multiple tissues, including sensory ganglia, infected during viremia



Varicella Pathogenesis





Varicella Clinical Features

- **Incubation** period 14 to 16 days (range 10 to 21 days)
- Mild **prodrome** for 1 to 2 days (adults)
- **Rash** generally appears first on head; most concentrated on trunk
- Successive crops over several days with lesions present in several stages of development



UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

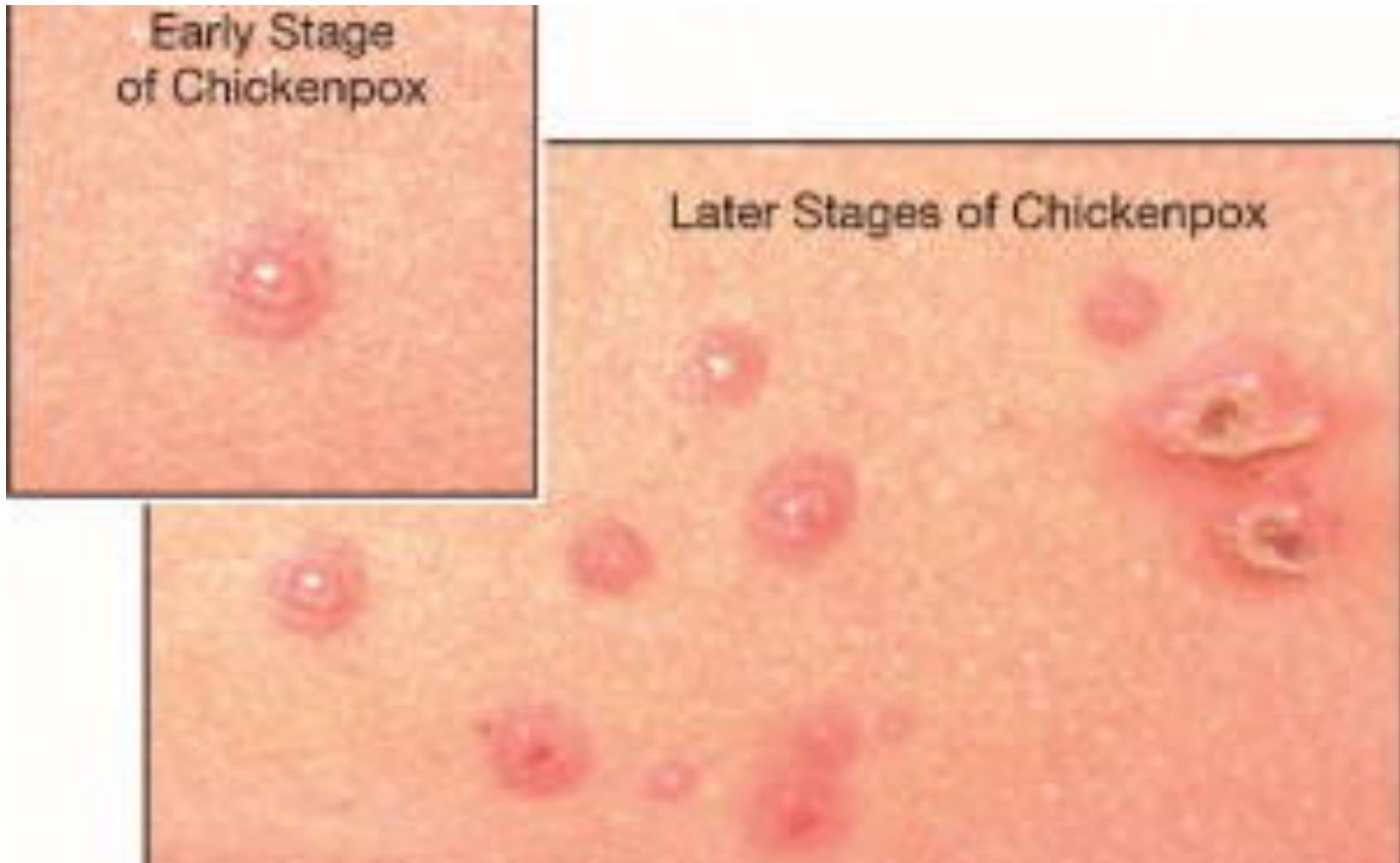
SCUOLA DI MEDICINA
CORSO DI IGIENE

Varicella Clinical Features





Varicella Clinical Features





UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

SCUOLA DI MEDICINA
CORSO DI IGIENE

Varicella Clinical Features





Varicella Complications

- Bacterial infection of skin lesions
- Pneumonia (viral or bacterial)
- Central nervous system manifestations
- Reye syndrome
- Hospitalization: 2-3 per 1,000 cases (children)
- Death: 1 per 60,000 cases



UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

SCUOLA DI MEDICINA
CORSO DI IGIENE

Varicella Complications

Bacterial infection of skin lesions





UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

SCUOLA DI MEDICINA
CORSO DI IGIENE

Varicella Complications

Bacterial infection of skin lesions





Groups at Increased Risk of Complications of Varicella

- Persons older than 15 years
- **Infants** younger than 1 year
- **Immunocompromised persons**
- Newborns of women with rash onset within 5 days before to 2 days after delivery



Congenital Varicella Syndrome

- Results from maternal infection during pregnancy
- Period of risk may extend through first 20 weeks of pregnancy
- Low birth weight, hypoplasia of extremity, skin scarring, eye and neurologic abnormalities
- Risk appears to be very low (less than 2%)



UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

SCUOLA DI MEDICINA
CORSO DI IGIENE

Congenital Varicella Syndrome





UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

SCUOLA DI MEDICINA
CORSO DI IGIENE

Congenital Varicella Syndrome



Varicella



Herpes Zoster (Shingles)

- Reactivation of varicella zoster virus (VZV)
- Associated with:
 - aging
 - **immunosuppression**
 - intrauterine exposure
 - varicella at younger than 18 months of age



UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

SCUOLA DI MEDICINA
CORSO DI IGIENE

Herpes Zoster (Shingles)





UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

SCUOLA DI MEDICINA
CORSO DI IGIENE

Herpes Zoster (Shingles)





Varicella Laboratory Diagnosis

- Isolation of varicella virus from clinical specimen
- Rapid varicella virus identification using **PCR** (preferred, if available) or DFA
- Significant rise in varicella IgG by any standard serologic assay



Varicella Epidemiology

- **Reservoir:**
 - human
- **Transmission:**
 - person to person – respiratory tract secretions
 - direct contact with lesions
- **Temporal pattern:**
 - peak in winter and early spring (U.S.)
- **Communicability:**
 - 1-2 days before to 4-5 days after onset of rash
 - may be longer in immunocompromised



Herpes Zoster

- 500,000 to 1 million episodes occur annually in the United States
- Lifetime risk of zoster estimated to be 32%
- 50% of persons living until age 85 years will develop zoster



Varicella-Containing Vaccines

- **Varicella vaccine**
 - approved for persons 12 months and older
- **Measles-mumps-rubella-varicella vaccine**
 - approved for children 12 months through 12 years
- **Herpes zoster vaccine (Zostavax)**
 - approved for persons 50 years and older



Varicella Vaccine Immunogenicity and Efficacy

- Detectable antibody
 - 97% of children 12 months through 12 years following 1 dose
 - 99% of persons 13 years and older after 2 doses
- 70% to 90% effective against any varicella disease
- 90%-100% effective against severe varicella disease



Varicella Breakthrough Infection

- Breakthrough infection is significantly milder, with fewer lesions
- No consistent evidence that risk of breakthrough infection increases with time since vaccination
- Retrospective cohort study of 115,000 children vaccinated in 2 HMOs during January 1995 through December 1999
- Risk of breakthrough varicella 2.5 times higher if varicella vaccine administered less than 30 days following MMR
- No increased risk if varicella vaccine given simultaneously or more than 30 days after MMRV



UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO

SCUOLA DI MEDICINA
CORSO DI IGIENE

Varicella Breakthrough Infection





Varicella Vaccine Recommendations Children

- Routine vaccination at 12-15 months of age
- Routine second dose at 4-6 years of age
- Minimum interval between doses of varicella vaccine is 1 month for children younger than 13 years of age



MMRV Vaccine

- Approved for children 12 months through 12 years of age (to age 13 years)
- Do not use for persons 13 years and older
- May be used for both first and second doses of MMR and varicella vaccines
- Minimum interval between doses is 3 months



Varicella Vaccine Recommendations Adolescents and Adults

- All persons 13 years of age and older without evidence of varicella immunity
- 2 doses separated by at least 4 weeks
- Do not repeat first dose because of extended interval between doses



Varicella Vaccine Postexposure Prophylaxis

- Varicella vaccine is recommended for use in persons without evidence of varicella immunity **after exposure to varicella**
 - 70%-100% effective if given within 3 days of exposure (possibly up to 5 days)
 - **not effective if administered more than 5 days after exposure** but will produce immunity if recipient is not infected



Varicella Vaccination Recommendations Healthcare Personnel

- ACIP recommends all healthcare personnel be immune to varicella
- Prevaccination serologic screening likely cost-effective for persons with uncertain history
- Postvaccination testing not necessary or recommended



Varicella Immunity

- Written documentation of age-appropriate vaccination
- Laboratory evidence of immunity or laboratory confirmation of disease
- Born before 1980
- Healthcare personnel diagnosis or verification of varicella disease
- History of herpes zoster based on healthcare provider diagnosis



Varicella-Containing Vaccines Contraindications and Precautions

- Severe allergic reaction to vaccine component or following a prior dose
- Immunosuppression
- **Pregnancy**
- Moderate or severe acute illness
- Recent blood product (varicella, MMRV)
- Personal or family (i.e., sibling or parent) history of seizures of any etiology (MMRV only)



Varicella Vaccine Use in Persons with Immunosuppression

- MMRV not approved for use in persons with HIV infection
- Do not administer zoster vaccine to immunosuppressed persons



Varicella Vaccine Adverse Reactions

- **Local reactions (pain, erythema)**
 - 19% (children)
 - 24% (adolescents and adults)
- **Generalized rash 3%**
 - may be maculopapular rather than vesicular
 - average 5 lesions
- Systemic reactions not common
- Adverse reactions similar for MMRV



Zoster Following Vaccination

- Most cases in children
- Not all cases caused by vaccine virus
- Risk from vaccine virus less than from wild-type virus
- Usually a mild illness without complications such as postherpetic neuralgia



Herpes Zoster Vaccine Efficacy

- Vaccine recipients 60 to 80 years of age had 51% fewer episodes of zoster
 - efficacy declines with increasing age
 - significantly reduces the risk of postherpetic neuralgia
- Reduces the risk of zoster 69.8% in persons 50 through 59 years of age



Herpes Zoster Vaccine

- Approved for persons 50 years and older
- ACIP does not recommend vaccination of persons younger than 60 years because of supply and lower risk of zoster in this age group



Herpes Zoster Vaccine Adverse Reactions

- Local reactions - 34% (pain, erythema)
- No increased risk of fever
- No serious adverse reactions identified