



# EXANTHEMATOUS INFECTIOUS DISEASES IN PEDIATRICS

**Prof. Dr. Ergin ÇİFTÇİ**

**Ankara University Faculty of Medicine  
Division of Pediatric Infectious Diseases**

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# EXANTHEMATOUS DISEASES

INFECTION



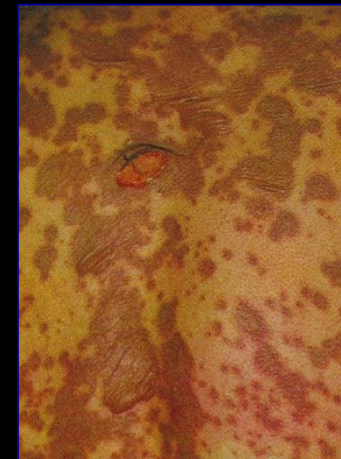
Measles

RASH



Kawasaki disease

NON-INFECTIOUS



Drug related TEN

**Recognition of infectious rash is very important for the patient, those who have been in contact with the patient, and public health.**

# IMPORTANT ISSUES IN THE DIAGNOSIS OF INFECTION RELATED EXANTHEMATOUS DISEASES

1. **Exposure-Previous rash disease-Vaccination history**
2. **The presence and features of the prodromal period**
3. **Characteristics of the rash**
4. **Presence of pathognomonic findings**
5. **Diagnostic laboratory tests**

# DISEASES THAT CAUSE MACULOPAPULAR RASH

Measles

Rubella

Scarlet fever

Roseola infantum

Erythema infectiosum

Staphylococcal toxic shock syndrome

Typhus

Meningococccemia

Toxoplasmosis

Cytomegalovirus infection

Infectious mononucleosis

Enteroviral infections

Toxic erythema

Drug rashes

Kawasaki disease



# DISEASES THAT CAUSE PAPULOVESICULAR RASH

**Chickenpox**

**Smallpox**

**Monkeypox**

**Eczema herpeticum**

**Eczema vaccinatum**

**Coxsackie virus infections**

**Rickettsial pox**

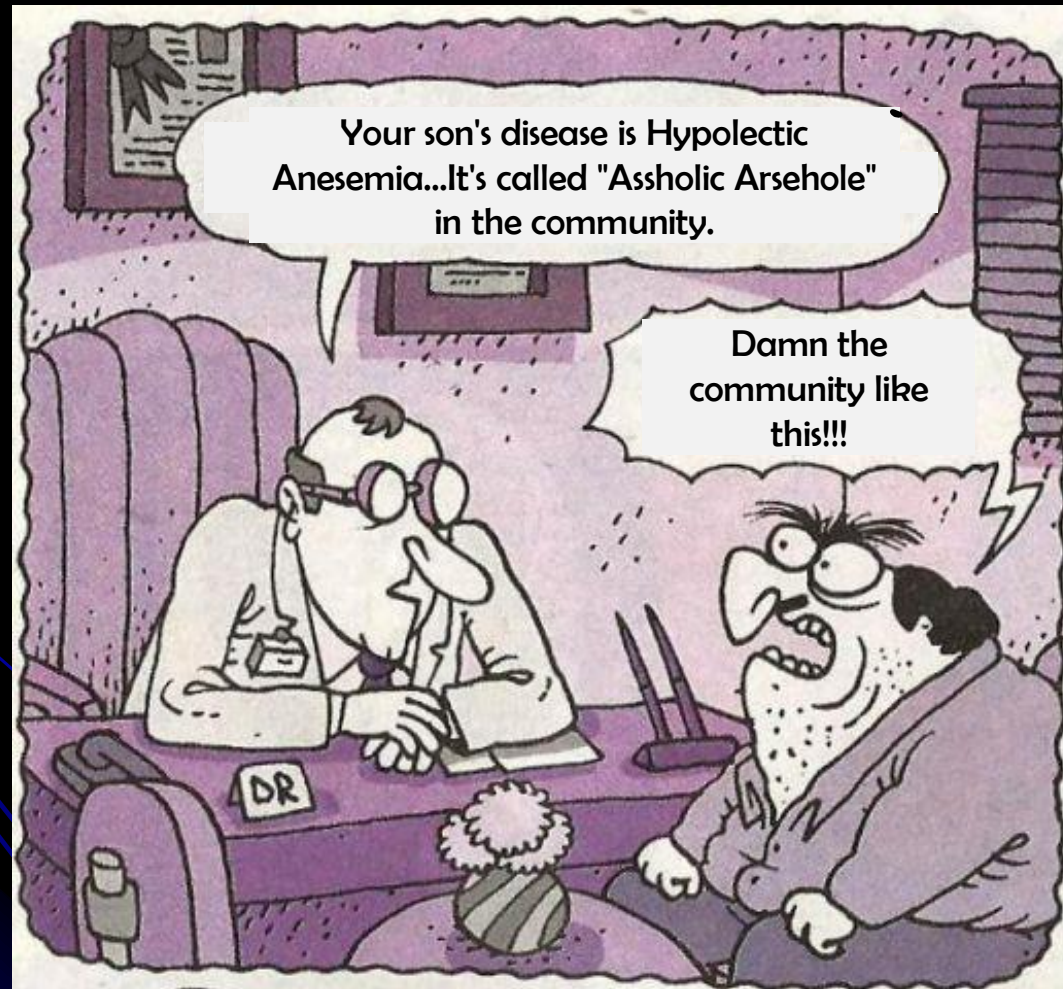
**Impetigo**

**Insect bite**

**Dermatitis herpetiformis**

# EXANTHEMATOUS DISEASES

## To be able to Tell in the Community's Language...



# HISTORICAL NOMINATION OF INFECTIOUS DISEASES WITH MACULOPAPULAR RASH

- ❑ Six separate childhood exanthems were defined in the late 19th, early part of the 20th Century. These were named in the order they were discovered and are outlined.
- ❑ The term fourth disease or Filatov-Dukes disease is thought to be a variant of scarlet fever and is no longer used.

<i>Number</i>	<i>Disease</i>
<i>First</i>	Measles (Rubeola)
<i>Second</i>	Scarlet fever
<i>Third</i>	Rubella (German measles)
<i>Forth</i>	Filatov-Dukes disease
<i>Fifth</i>	Erythema infectiosum
<i>Sixth</i>	Roseola infantum, Exanthem subitum

# MEASLES

CAUSATIVE AGENT	It is an RNA virus of the Paramyxoviridea family
COMMON AGE	<15 Years
TRANSMISSION	Droplets (Virus uses CD150 and PVRL4 receptors)
INCUBATION PERIOD	8-12 days
PRODROME	Fever, dry cough, rhinorrhea, conjunctivitis, photophobia, Koplik spots





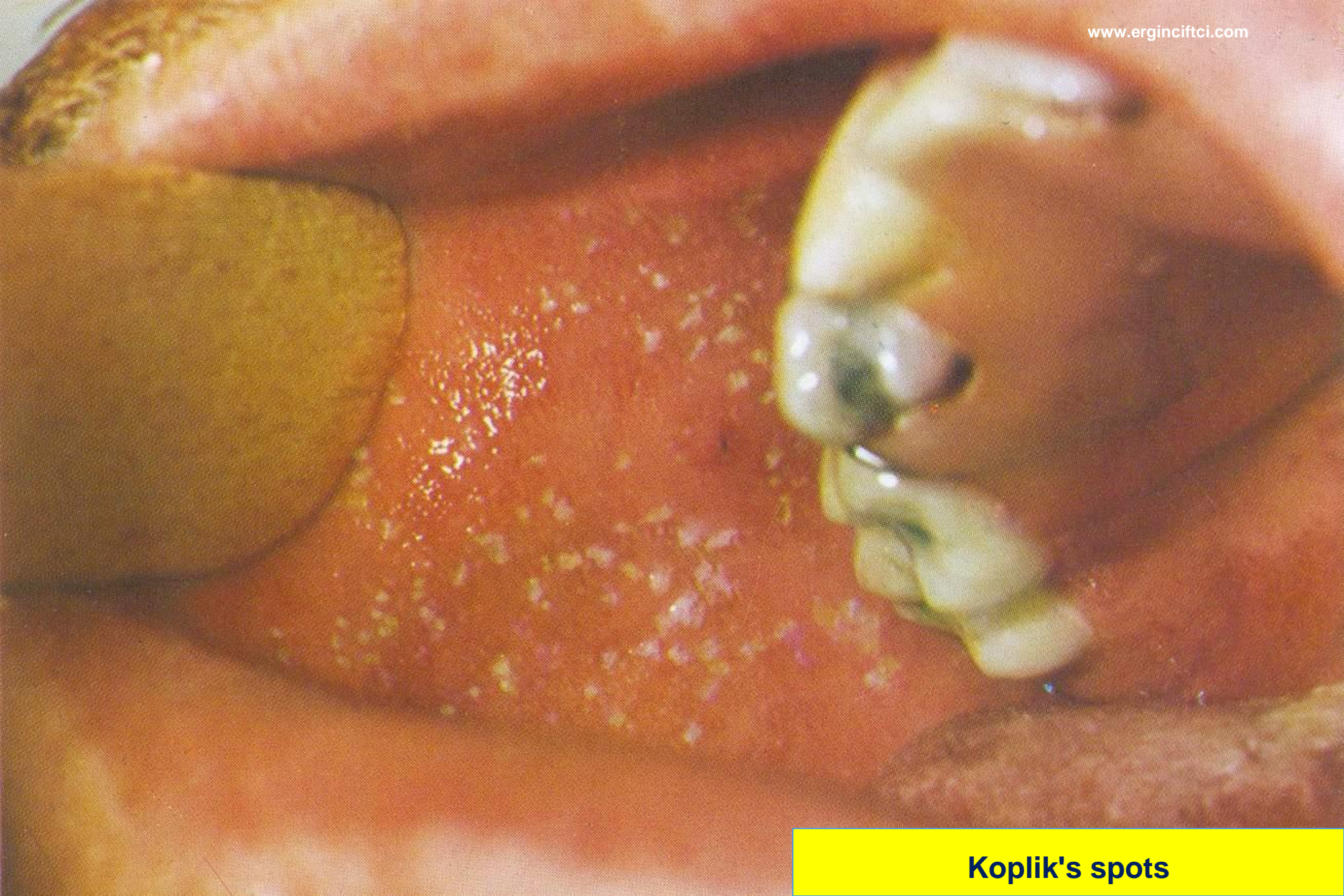
**Conjunctivitis**





**Photophobia**





**Koplik's spots**



# MEASLES

## RASH

**Begins on forehead, hairline, behind ears, upper neck.**

**Spreads to face, neck, trunk and extremities.**

**It has spread to the whole body on the third day.**

**Lesions may merge with each other, except those on the extremities.**

**It fades in the same order it started.**

**Mild desquamation is seen as it fades.**

**Leaves brownish pigmentation in place.**

**Rashes on hands and feet do not desquam.**

**FIRST DAY**

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**SECOND DAY**

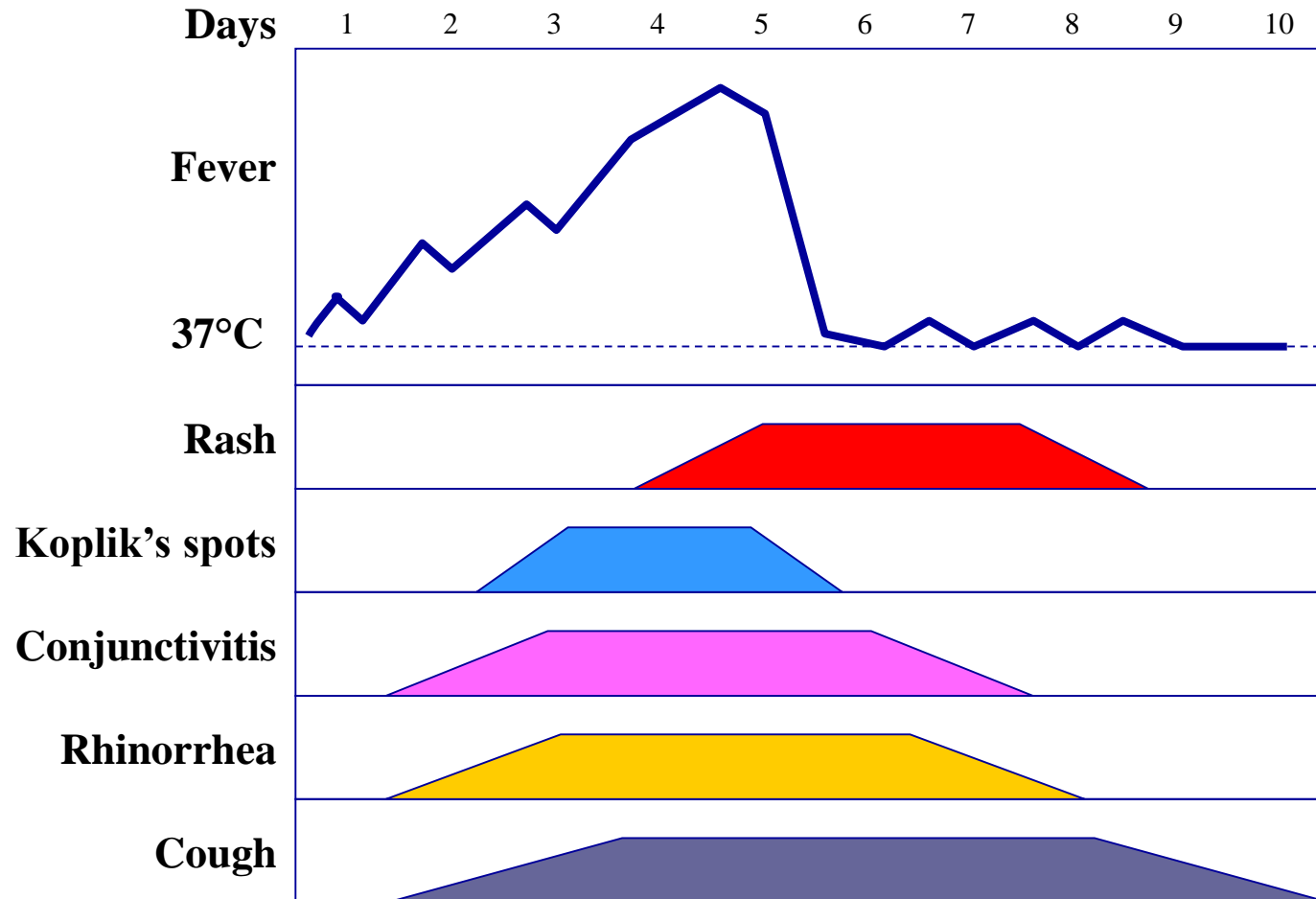


**THIRD DAY**





# MEASLES





# MEASLES

## Complications

- ❑ Otitis media
- ❑ Pneumonia
- ❑ Croup
- ❑ Tracheitis
- ❑ Bronchiolitis obliterans
- ❑ Diarrhea
- ❑ Encephalitis (1-3/1000)
- ❑ Subacute sclerosing panencephalitis (SSPE) (1/100.000)

# MEASLES

## Current Status

### Kızamık 2018'de 142 bin can aldı (En fazla ölüm; aşılanmayan 5 yaş altı çocuklarda)

Dünya Sağlık Örgütü tarafından açıklanan rakamlara göre 2018 yılında kızamıktan ölenlerin sayısı 142 bin kişi. Dünya Sağlık Örgütü, kızamıktan ölenlerin çoğunun aşılanmayan beş yaş altı çocuklar olduğunu açıkladı.

ntv.com.tr 06.12.2019 - 11:29



### Türkiye'de 2019'un ilk 8 ayında 2 bin 391 kızamık olgusu bildirildi

Kızamık vaka sayısının dünya çapında 2018 yılına oranla üç kat arttığını açıklayan Dünya Sağlık Örgütü küresel kızamık salgını uyarısı yaptı. Kızamığın, yılda 89.780 kişinin ölümünden sorumlu olduğunu belirten Dr. Özden Türel, bu durumun en önemli nedeninin hızla artan aşı karışıklığı olduğunu söyledi. Türkiye'de 2019'un ilk 8 ayında 2.391 kızamık olgusu bildirildiğini söyleyen Dr. Okan Derin, "Kızamık da diğer aşı ile korunulabilen hastalıklar gibi toplumun zayıf düşmesini bekleyen sinsî bir düşman gibi kapımızda" dedi

04 Eylül 2019

NTV

TÜLAY KARABAĞ



# MEASLES

INFECTIONIOUS PERIOD	Begins 3 days before rash Lasts up to 4-6 days of rash
PREVENTION	<p> <b>Active immunization:</b> Live measles vaccine            MMR at 12th months and 48th months            Protective if given within the first 72 hours after contact         </p> <p> <b>Passive immunization:</b> Immunglobuline IMIG            Protective if given within the first 6 days of exposure            Pregnants, immunocompromised            0.25 mL/kg (for immunocompromised (0.5 mL/kg) up to 15 mL  <b>IVIG</b> 400 mg/kg         </p>
TREATMENT	<p>           Supportive (Paracetamol or Ibuprofen)  <b>Vitamine A</b>      ≥12 months 200 000 U/day                                     6-11 months 100 000 U/day                                     &lt;6 months 50 000 U/day                                     2 days         </p> <p>           If there is evidence of vitamin A deficiency,            a third dose is given after 2-4 weeks.         </p>

# SCARLET FEVER

CAUSATIVE AGENT	Group A beta-hemolytic streptococcus ( <i>Streptococcus pyogenes</i> )
COMMON AGE	5-15 Years
TRANSMISSION	Droplets, foods
INCUBATION PERIOD	1-7 days (average 2-4 days)
PRODROME	High fever, sore throat, abdominal pain, vomiting

# SCARLET FEVER

## RASH

### ENANTHEMA

Tonsils: Hyperemic, hypertrophic, exuding

Pharynx: Edema, hyperemic

Tongue: Strawberry tongue (white and red)

Soft palate: Petechiae

### EXANTHEMA

Macular rash with small papules

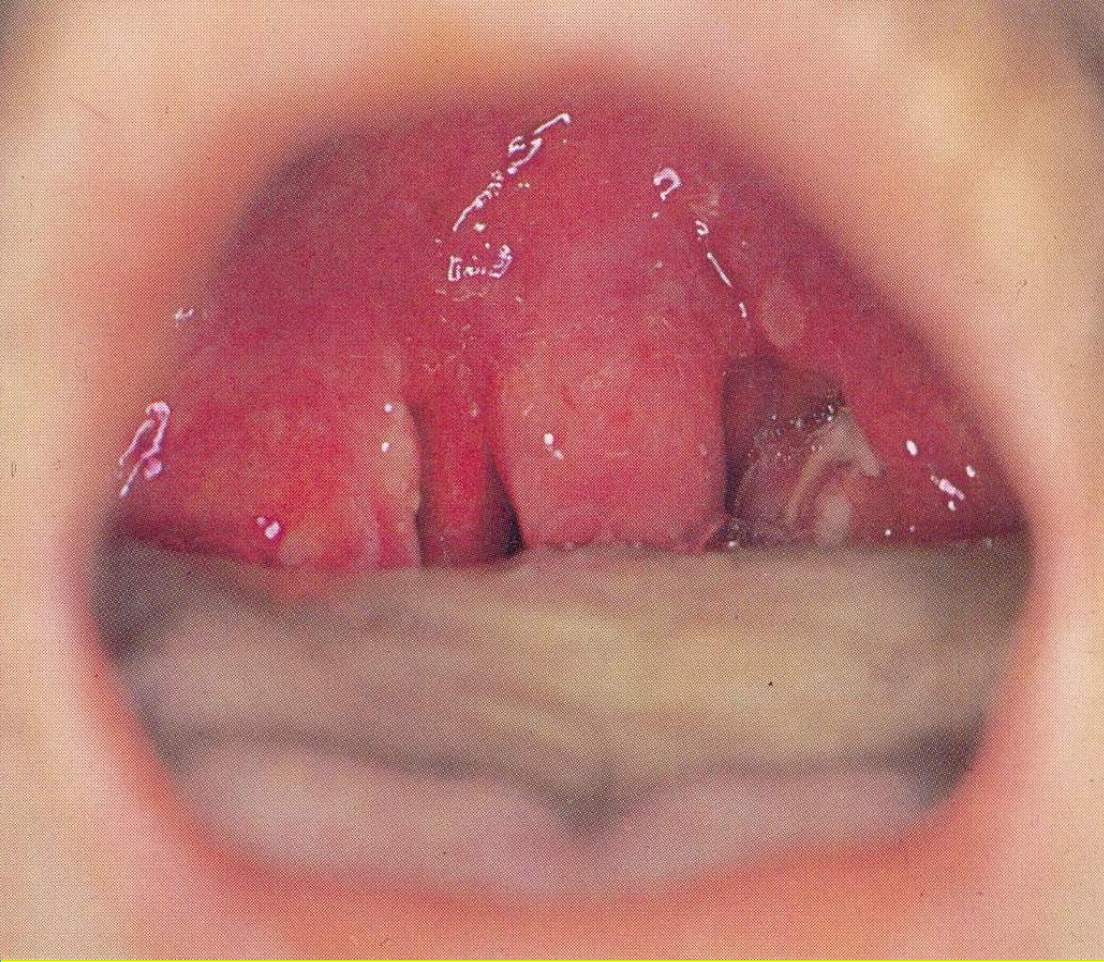
Goose skin or Sandpaper-like appearance

Peroral pallor

Pastia lines

Healing with desquamation





**Pharyngitis, palatal petechiae**

**Pharyngitis, exudative tonsillitis**







**White strawberry tongue**

**Red strawberry tongue**







**Circumoral pallor**



**Goose skin or Sandpaper-like rash**





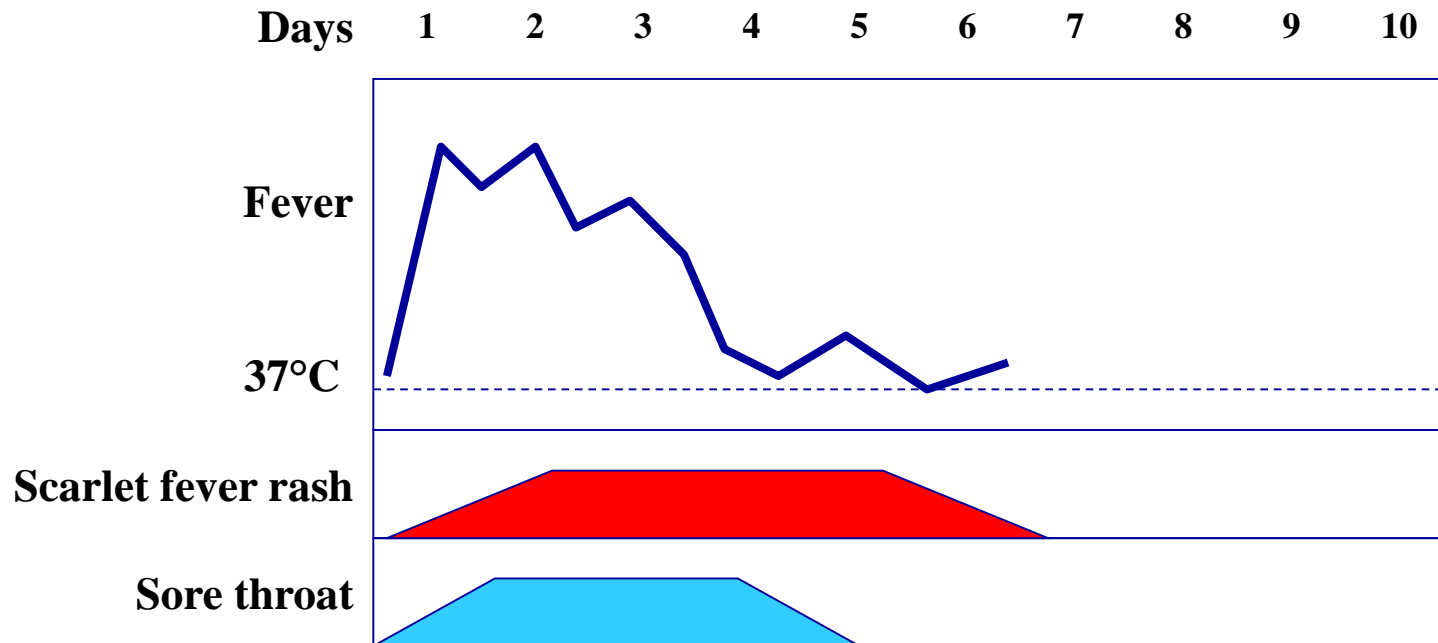
**Pastia's lines**



**Desquamation**



# SCARLET FEVER



# SCARLET FEVER

## Complications

### EARLY PERIOD

- ☐ Cervical lymphadenitis
- ☐ Peritonsillar abscess
- ☐ Retropharyngeal abscess
- ☐ Acute otitis media
- ☐ Acute sinusitis
- ☐ Bronchopneumonia
- ☐ Meningitis
- ☐ Brain abscess
- ☐ Septic arthritis
- ☐ Osteomyelitis
- ☐ Endocarditis
- ☐ Cellulitis
- ☐ Necrotizing fasciitis
- ☐ Bacteremia
- ☐ Streptococcal toxic shock syndrome

### LATE PERIOD

- ☐ Acute rheumatic fever
- ☐ Poststreptococcal reactive arthritis
- ☐ Poststreptococcal glomerulonephritis
- ☐ PANDAS  
(Pediatric Autoimmune Neuropsychiatric Disorders  
Associated with Streptococcal Infections)

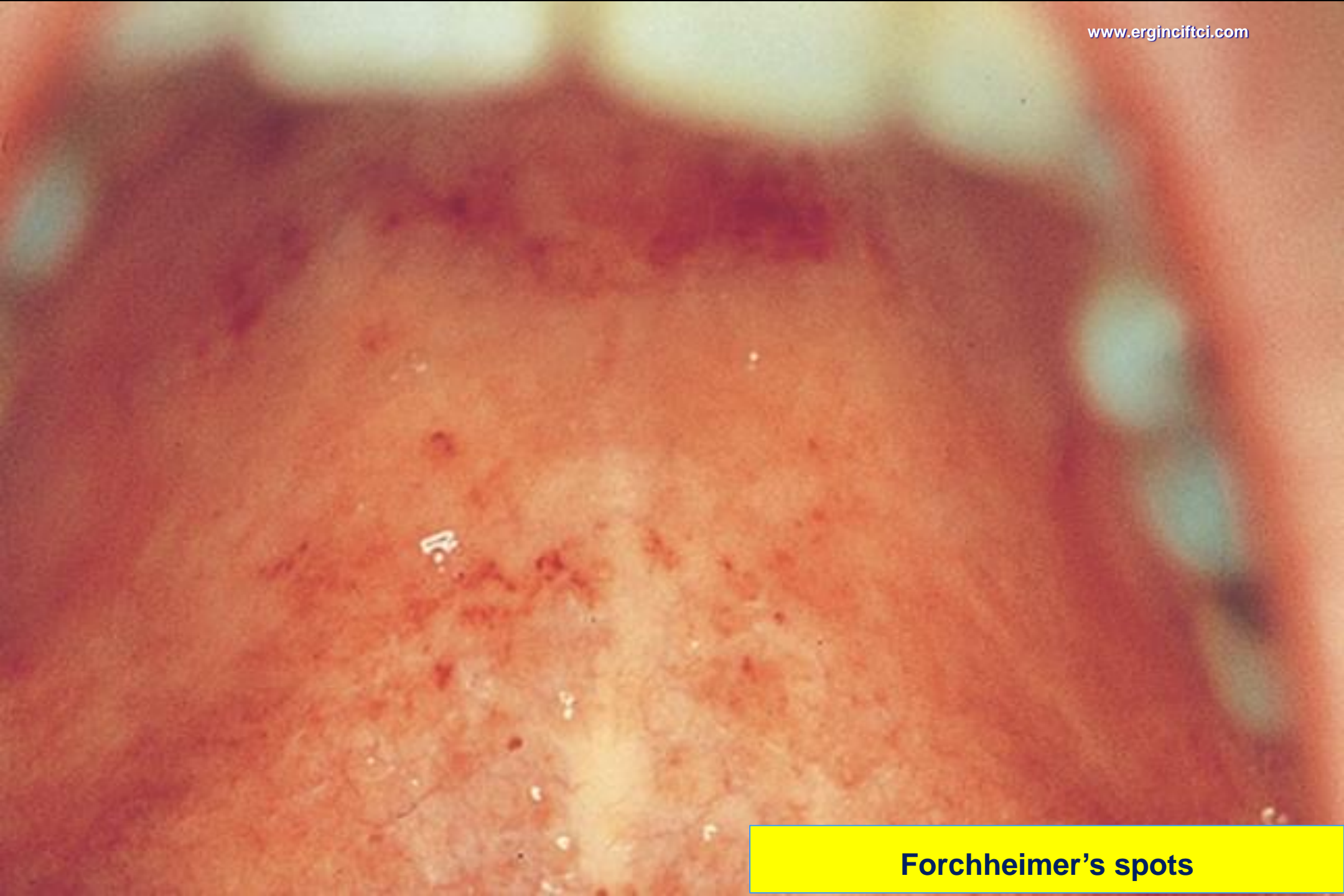


# SCARLET FEVER

DIAGNOSIS	Clinical findings Rapid strep A antigen test Throat culture																								
INFECTIOUS PERIOD	Highest during acute infection. It then subsides and lasts for weeks. With appropriate antibiotic treatment, not contagious after 24 hrs																								
TREATMENT	<table><tr><th>Antibiotic</th><th>Dose</th><th>Daily dose</th><th>Route</th><th>Duration</th></tr><tr><td>Benzathine penicillin G</td><td>600 000 U (≤27 Kg) 1 200 000 U (&gt;27 Kg)</td><td>1</td><td>IM</td><td>Once</td></tr><tr><td>Penicillin V</td><td>250 mg (400 000 U)/dose (≤27 Kg) 500 mg (800 000 U) /dose (&gt;27 Kg)</td><td>2-3</td><td>Oral</td><td>10 days</td></tr><tr><td>Amoxicillin</td><td>50 mg/kg/dose (max 1000 mg/dose) 25 mg/kg/dose (max 500 mg/dose)</td><td>1 2</td><td>Oral</td><td>10 days</td></tr></table>					Antibiotic	Dose	Daily dose	Route	Duration	Benzathine penicillin G	600 000 U (≤27 Kg) 1 200 000 U (>27 Kg)	1	IM	Once	Penicillin V	250 mg (400 000 U)/dose (≤27 Kg) 500 mg (800 000 U) /dose (>27 Kg)	2-3	Oral	10 days	Amoxicillin	50 mg/kg/dose (max 1000 mg/dose) 25 mg/kg/dose (max 500 mg/dose)	1 2	Oral	10 days
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# RUBELLA

CAUSATIVE AGENT	It is an RNA virus from the Togaviridae family.
COMMON AGE	5-14 Years
TRANSMISSION	<i>Postnatal rubella</i> transmitted by droplets <i>Congenital rubella</i> transmitted transplacentally
INCUBATION PERIOD	14-21 days
PRODROME	<p>Often, a prodromal period cannot be noticed Rarely, 1-5 days of prodrome symptoms may be present. Mild fever, headache, malaise, mild rhinorrhea and conjunctivitis without photophobia</p> <p>Lymphadenopathies may be noticed at least 24 hours before the rash Retroauricular, suboccipital, and posterior cervical LAP Pink enanthemas (Forchheimer's spots) can be on the soft palate</p>



**Forchheimer's spots**



# RUBELLA

## RASH

The rash starts from the face area.  
However, while rash appear on the trunk,  
the facial lesions disappears.  
Maculopapular rash spread all over the body in 24 hours.  
The rash resembles a scarlet rash on the second day,  
especially on the trunk.  
On the third day, the rash completely disappear.  
Usually, there is no high fever.



**Rubella rash**





**Rubella rash**



# RUBELLA

Days    1    2    3    4    5    6    7    8    9    10

**Fever**

37°C

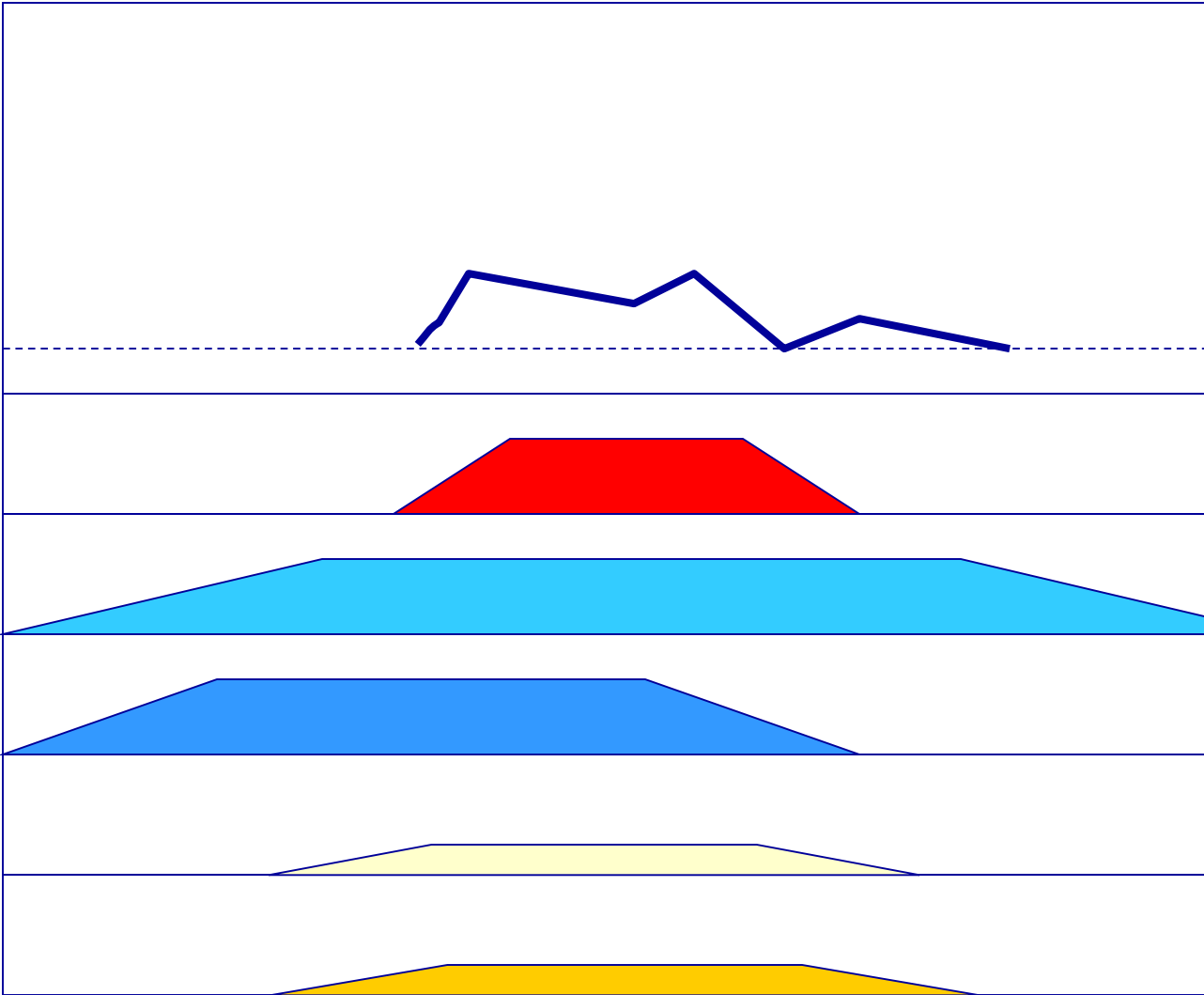
**Rash**

**Lymphadenopathy**

**Malaise**

**Conjunctivitis**

**Rhinorrhea**



# RUBELLA

## Complications

- ❑ Encephalitis (1/6000)
- ❑ Thrombocytopenia
- ❑ Arthralgia, arthritis
- ❑ Progressive rubella panencephalitis
- ❑ **Congenital rubella syndrome**



# RUBELLA

## Congenital Rubella Syndrome

The period of pregnancy is important

Infection in the first trimester increases the fetal damage

The first trimester

70%

In the first 11 weeks

90%

At the end of the first trimester

10-20%

At 17th week

Risk is very small

# RUBELLA

## Congenital Rubella Syndrome

- ❑ Intrauterine growth retardation (IUGR)
- ❑ Cataract
- ❑ Microphthalmia
- ❑ Congenital heart disease (PDA, pulmonary stenosis)
- ❑ Myocarditis
- ❑ Sensorineural deafness
- ❑ Meningoencephalitis
- ❑ Skin lesions (Blueberry muffins)
- ❑ Pneumonia
- ❑ Hepatitis
- ❑ Anemia
- ❑ Thrombocytopenia
- ❑ Bone lesions (Celery stalk)
- ❑ Mental and motor retardation



# RUBELLA



**Cataract**

# RUBELLA



**Blueberry muffins**



# RUBELLA



**Celery stalk**

# RUBELLA

## Diagnosis

### Pregnant

Rubella IgM and IgG

### Prenatal

Virus culture (Amnion fluid)

Rubella IgM (Cordon blood)

### Postnatal

Rubella IgM

Virus culture (Throat swabs, urine, tissue)

## Treatment

None

## Prevention

Pre-pregnancy vaccine

At least 1 month should be waited for pregnancy  
after vaccination.



# RUBELLA

INFECTIOUS PERIOD	<p><b><i>Postnatal rubella</i></b></p> <p>Begins 7 days before rash</p> <p>Lasts up to 7 days after the rash appears</p> <p><b><i>Congenital rubella</i></b></p> <p>The newborn can spread the virus with nasopharyngeal secretions and urine for up to 1 year.</p>
PREVENTION	<p><b>Active immunization:</b> Live rubella vaccine (in the form of MMR)</p> <p><b>Passive immunization:</b> Immunglobuline (for pregnant women)</p>
TREATMENT	<p>Supportive (Paracetamol or Ibuprofen)</p>

# FIFTH DISEASE

## Erythema Infectiosum

CAUSATIVE AGENT	Parvovirus B19
COMMON AGE	5-15 Years
TRANSMISSION	<i>Postnatal infection</i> droplet and percutaneous contact with blood <i>Congenital infection</i> transplacental
INCUBATION PERIOD	4-28 days (average 16-17 days)
PRODROME	It is usually mild Mild fever (15-30%), headache, arthralgia, myalgia



# FIFTH DISEASE

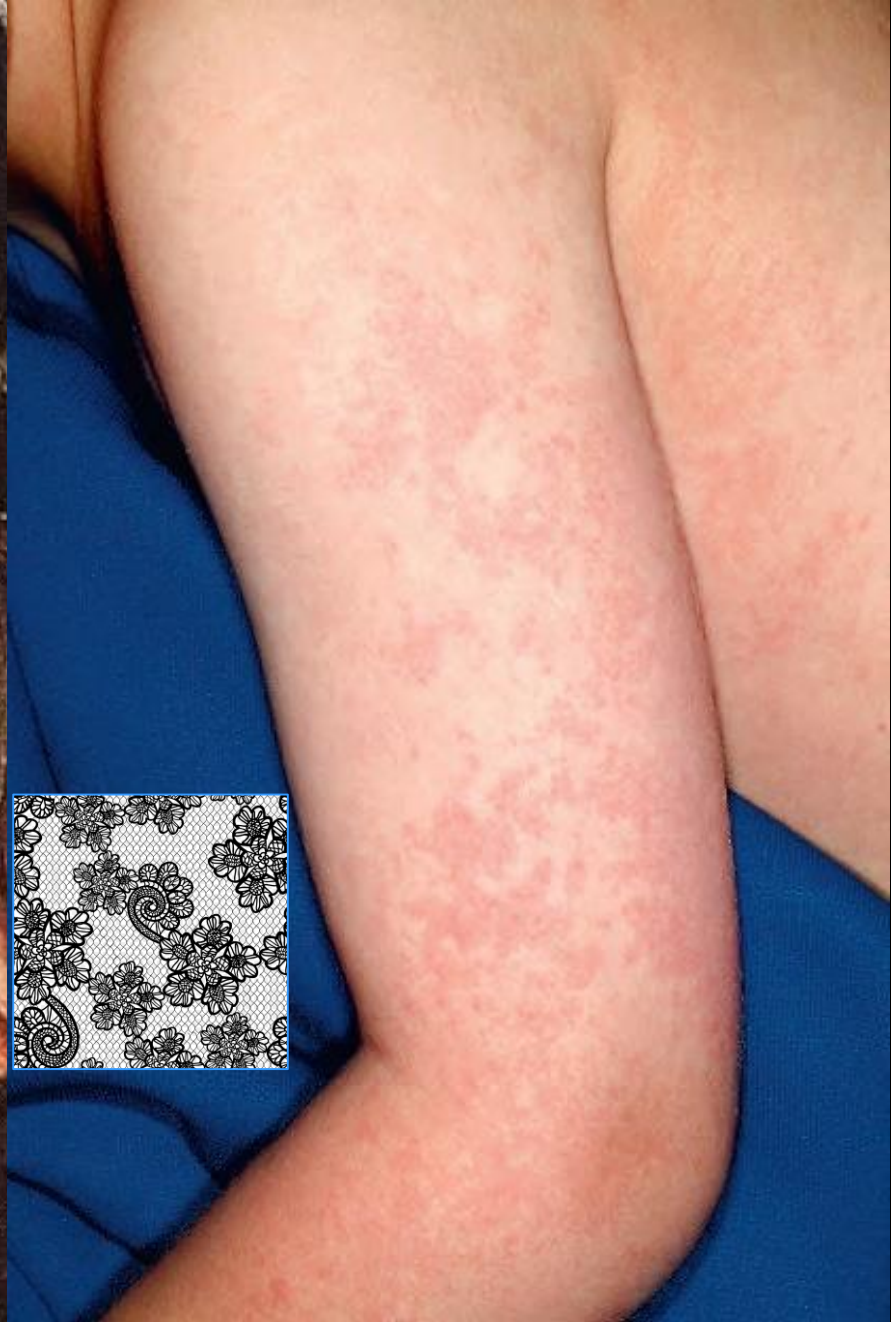
## Erythema Infectiosum

### RASH

Erythema of the cheeks (Slapped cheek appearance)  
Lacy maculopapular rash (on the arms, trunk, buttocks and legs)  
Disappearance and reappearance of rashes  
(heat, exercise, sunlight, etc.)



**“Slapped cheek” rash**



**Fifth disease «Lacy» rash**



# FIFTH DISEASE

## Erythema Infectiosum

### Complications

- ❑ Arthritis
- ❑ Chronic anemia (in those with immunodeficiency)
- ❑ Aplastic crisis (in chronic hemolytic anemia)
- ❑ Aseptic meningitis
- ❑ Hemophagocytic syndrome
- ❑ Thrombocytopenic purpura
- ❑ **Intrauterine infection**

# FIFTH DISEASE

## Erythema Infectiosum

### Complications

#### Intrauterine infection

Abortus

Severe anemia

Hydrops fetalis

Heart failure

Other than that, it does not cause defect

#### Diagnosis

Serology and PCR (pregnant's blood, fetal blood, amniotic fluid)

#### Treatment

Intrauterin blood tranfusion may be required



# FIFTH DISEASE

## Erythema Infectiosum

### Complications



**Hidrops Fetalis**



# FIFTH DISEASE

## Erythema Infectiosum

INFECTIOUS PERIOD	<p>Contagious before the rash appears Not contagious after rash begins</p> <p><b>Patients with aplastic crisis</b> contagious for 1 week</p>
TREATMENT	<p>Supportive (Paracetamol or Ibuprofen) IVIG (In immunocompromised patients with anemia)</p>

# SIXTH DISEASE

## Roseola infantum (Exanthema subitum)

CAUSATIVE AGENT	Human Herpesvirus-6 and 7
COMMON AGE	6-36 months
TRANSMISSION	Transmitted by close contact with the secretions of asymptomatic individuals 3/4 of healthy adults carry the virus
INCUBATION PERIOD	5-15 days (average 10 days)
PRODROME	High fever lasting 3-5 days, irritability Febrile convulsion
CLINICAL PICTURE	Fever without rash Febrile convulsion Exantematous disease (Roseola infantum or Exanthema subitum)



# SIXTH DISEASE

## Roseola infantum (Exanthema subitum)

### RASH

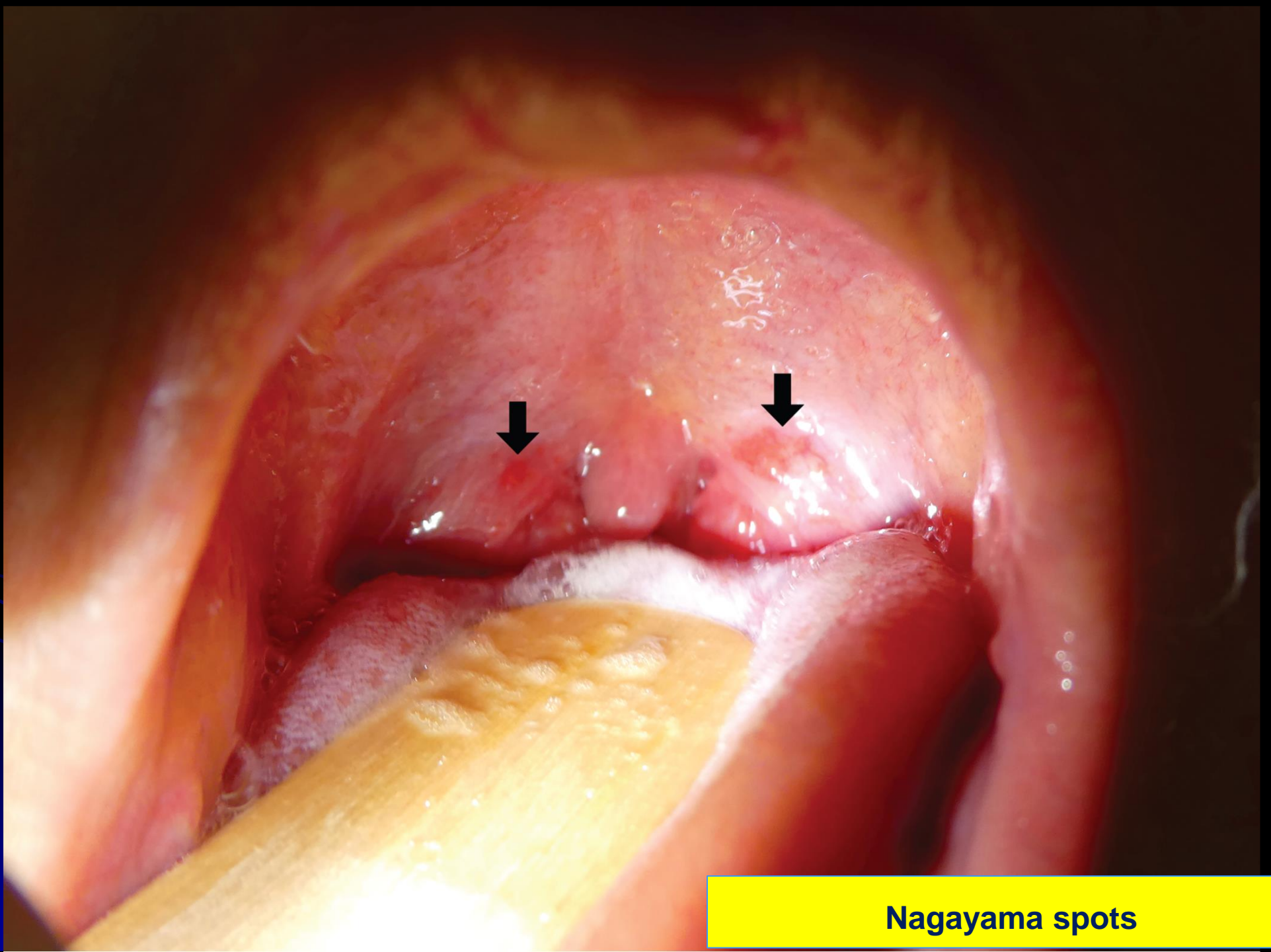
When the fever falls, a rash appears

It is maculopapular

Starts from the trunk and spreads

It is short-lived (may take 1-3 days)

In Asian countries, ulcers can be seen at the uvulopalatoglossal junction (**Nagayama** spots)



**Nagayama spots**





**Sixth disease rash**

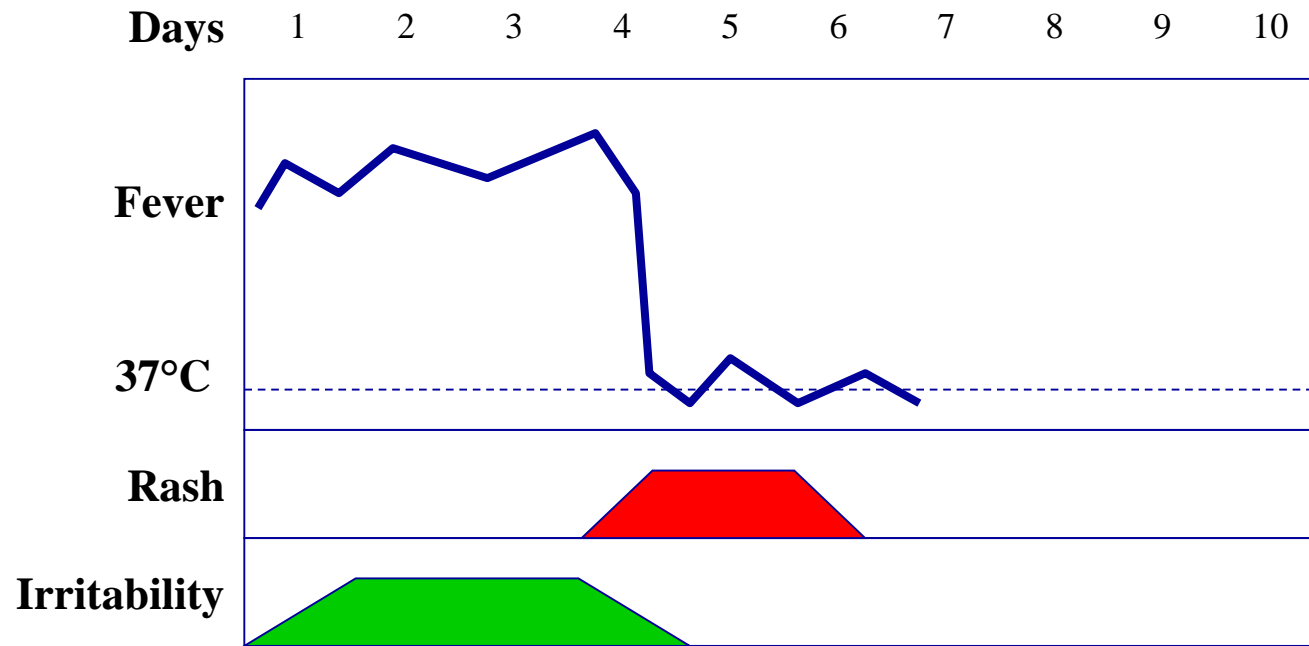


**Sixth disease rash**



# SIXTH DISEASE

## Roseola infantum (Ekzantem subitum)



# SIXTH DISEASE

Roseola infantum (Exanthema subitum)

## Complications

- ❑ Hepatitis
- ❑ Encephalitis
- ❑ Pneumonia
- ❑ Hemophagocytic syndrome

# SIXTH DISEASE

## Roseola infantum (Exanthema subitum)

INFECTIOUS PERIOD	Contagious permanently
TREATMENT	Supportive (Paracetamol or Ibuprofen) Antiviral therapy unnecessary



# CHICKENPOX

CAUSATIVE AGENT	Varicella-Zoster virus
COMMON AGE	<15 Years
TRANSMISSION	<i>Postnatal infection</i> transmitted by droplet and direct contact. <i>Congenital infection</i> transplacental transmission
INCUBATION PERIOD	10-21 days (average 14-16 days)
PRODROME	Mild fever, malaise, loss of appetite before 24 hours from rash

# CHICKENPOX

## RASH

The rash starts from the trunk and face and spreads to the whole body  
Rash is also seen on the scalp  
It is in the form of papule, vesicle and crusty lesions  
Lesions continue to appear for 3 days  
It form painful lesions in the mouth and genital area  
Lesions are itchy  
The fever may be high during the exanthematous period.

# CHICKENPOX



**Polimorph rash**



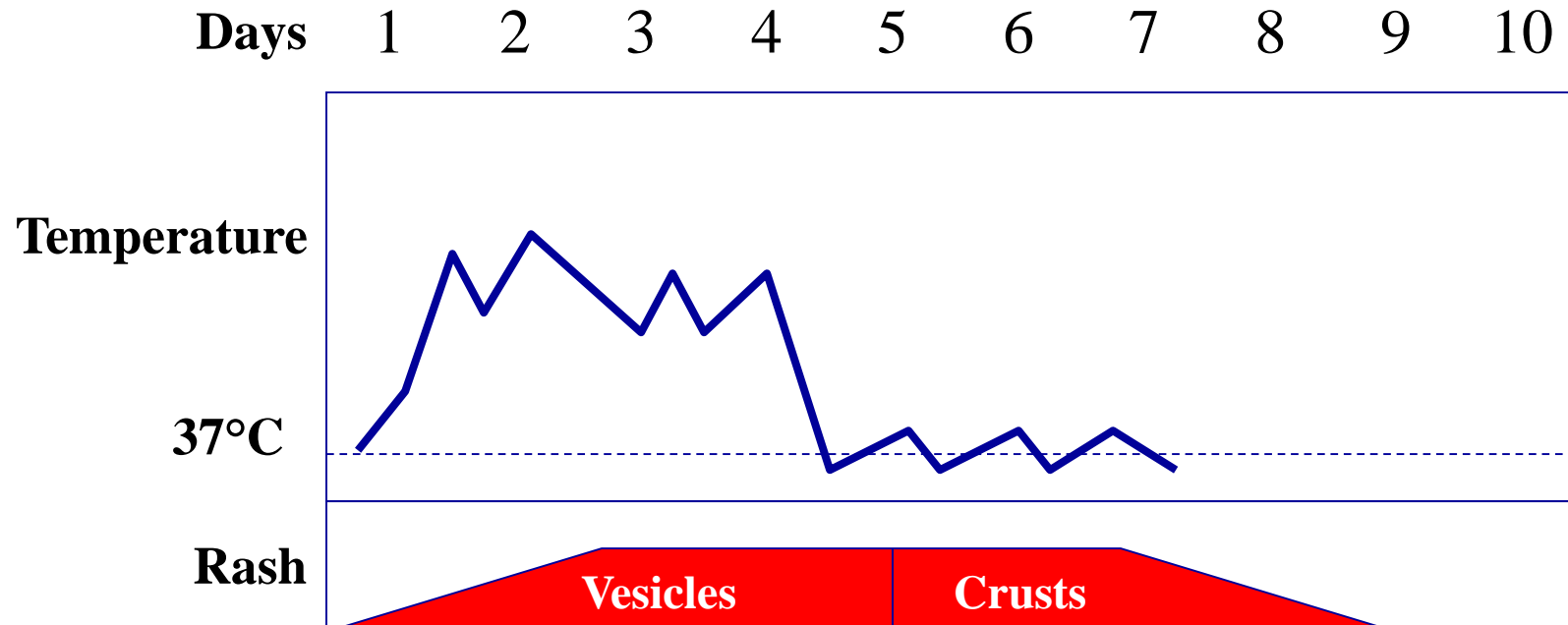
**Oral chickenpox lesions**



**Severe chickenpox rash**



# CHICKENPOX



# CHICKENPOX

## Complications

- ❑ Secondary skin infections
- ❑ Pneumonia
- ❑ Hepatitis
- ❑ Arthritis
- ❑ Thrombocytopenia
- ❑ Reye's syndrome
- ❑ Encephalitis, meningitis, cerebellar ataxia
- ❑ Herpes zoster
- ❑ Congenital varicella syndrome



**Herpes zoster**



**Herpes zoster**



# CHICKENPOX

## Complications

### PREGNANCY PERIOD

The first 20 weeks



**Congenital varicella syndrome**

Depends on mother's chickenpox immunity

Embryopathy risk  $\leq 2\%$

The last 20 weeks



**Herpes zoster  
in infancy or childhood**

5 days before delivery  
2 days after delivery



**Severe varicella infection  
in newborn**

# CHICKENPOX

## Complications

<b>Skin</b>	<b>Cicatricial lesions, hypopigmentation, bullous lesions</b>
<b>Extremities</b>	<b>Hypoplastic limbs, muscular atrophy/denervation Finger anomaly/absence</b>
<b>Eyes</b>	<b>Chorioretinitis, microphthalmia, anisocoria</b>
<b>CNS</b>	<b>Cortical atrophy, encephalitis, mental retardation, convulsion</b>
<b>GIS</b>	<b>Esophageal dilatation/reflux</b>
<b>Urinary system</b>	<b>Hydronephrosis/hydroureter</b>

# CHICKENPOX

## Complications



**Cicatricial scarring**



**Extremity anomaly**



# CHICKENPOX

INFECTIOUS PERIOD	<p>Begins 1-2 days before rash</p> <p>Lasts until all the vesicles have crusted</p>
PREVENTION	<p><b>Active immunization:</b> <b>Varicella vaccine.</b> Live-attenuated vaccine. Single dose is administered at the age of 12 months. 2nd dose can be given at 4-6 years old.</p> <p>After chickenpox exposure, can be given in the first 3-5 days.</p> <p><b>Passive immunization:</b> <b>Varicella-zoster immune globulin (VZIG)</b></p> <p>After chickenpox exposure, should be given VZIG within the first 10 days.</p> <p><b>IVIG 400 mg/kg</b></p>
TREATMENT	<p>Paracetamol or Ibuprofen (Aspirin is contraindicated! <b>Reye syndrome</b>)</p> <p>Acyclovir</p> <ul style="list-style-type: none"><li>≥13 years old children</li><li>People who are infected by household transmission</li><li>Severe clinical illness</li><li>Chronic skin or lung disease</li><li>Receiving long-term salicylate therapy</li><li>Using aerosol steroids</li><li>Immunodeficiency</li></ul>

YOU'RE GOING  
TO GET THE  
MEASLES!

FORTUNE  
TELLER

