EXANTHEMATOUS INFECTIOUS DISEASES IN PEDIATRICS

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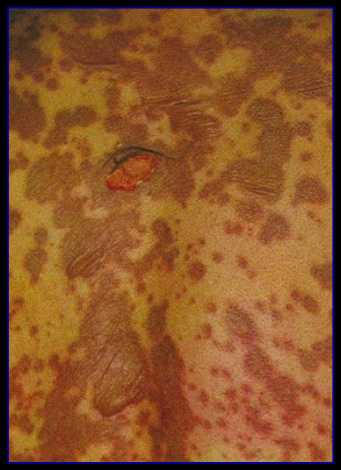
EXANTHEMATOUS DISEASES

INFECTION ← **RASH** → **NON-INFECTIOUS**

Measles



Drug reaction

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:** Have you been in contact with a patient with a rash in the last 1-2 weeks in the history?
2. **Previous rash disease:** Have you been a rash disease in the past?
3. **Vaccination history**
4. **The presence and features of the prodromal period**
5. **Characteristics of the rash:** Onset site, maculopapular or maculopapular...
6. **Presence of pathognomonic findings**
7. **Diagnostic laboratory tests:** Measles IgM and IgG

DISEASES THAT CAUSE MACULOPAPULAR RASH

- Measles
- Rubella
- Scarlet fever
- Roseola infantum
- Erythema infectiosum

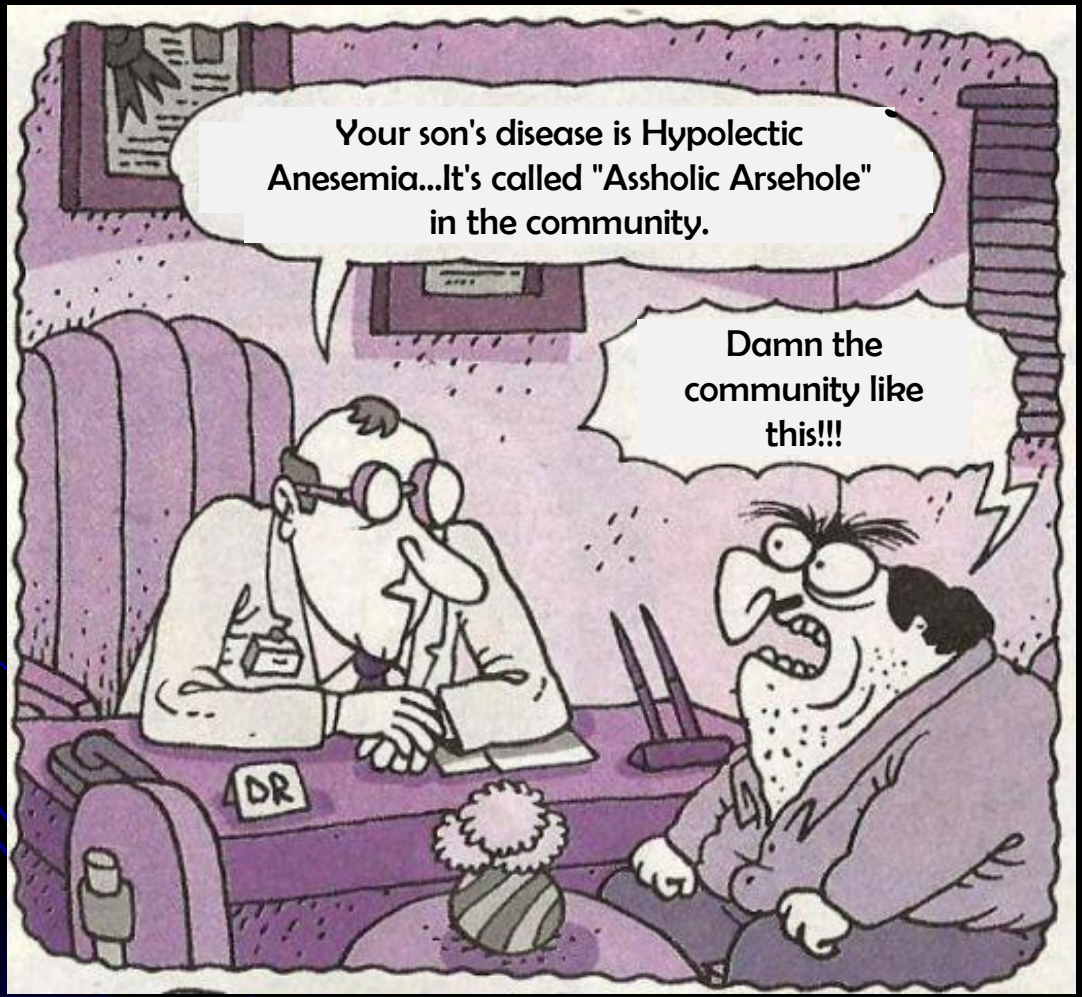
- Staphylococcal toxic shock syndrome
- Typhus
- Meningococcemia
- Toxoplasmosis
- Cytomegalovirus infection
- Infectious mononucleosis
- Enteroviral infections
- Toxic erythema
- Drug rashes
- Kawasaki disease

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.

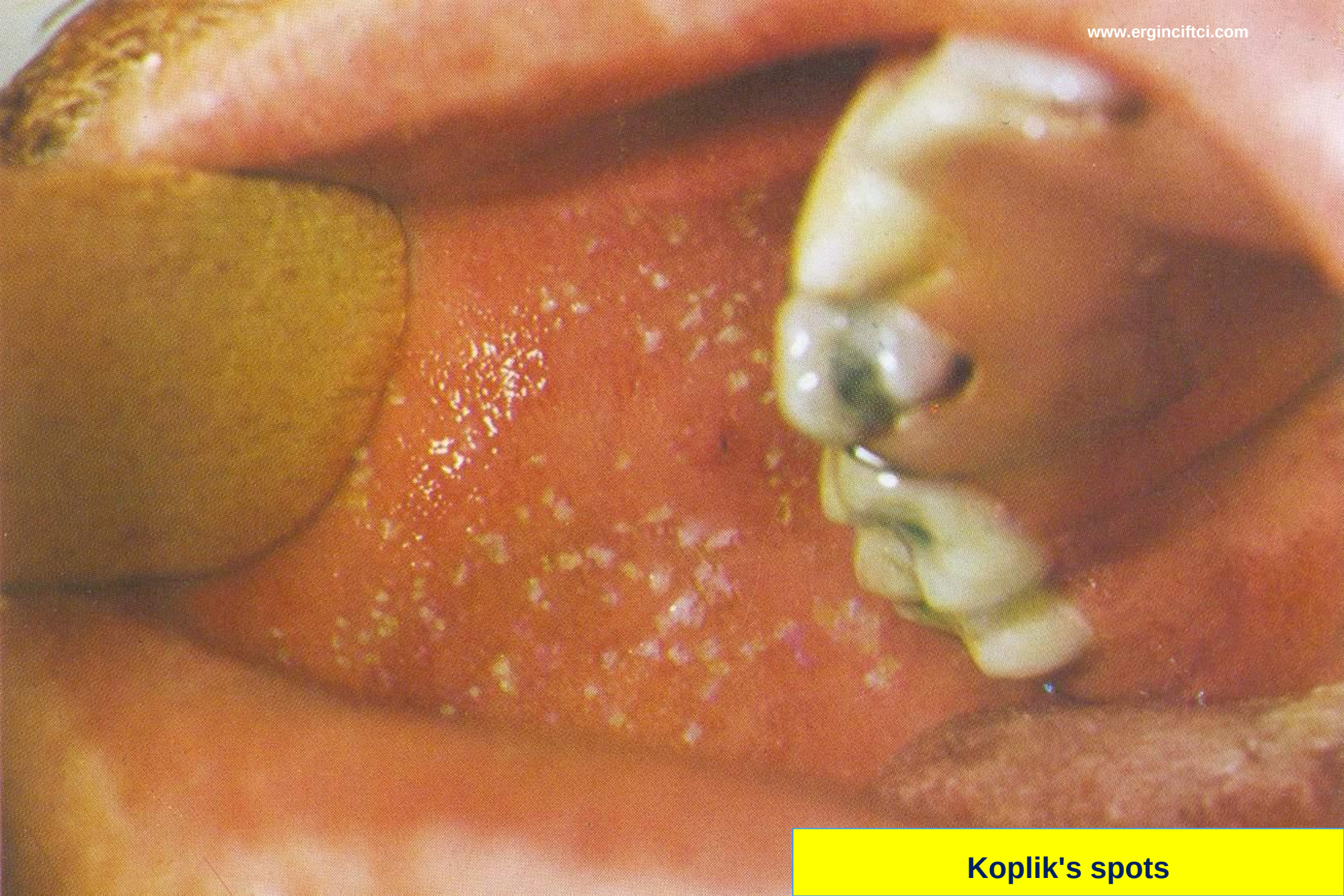
Number	*Disease*
First	Measles (Rubeola)
Second	Scarlet fever
Third	Rubella (German measles)
Forth	Filatov-Dukes disease
Fifth	Erythema infectiosum
Sixth	Roseola infantum, Exanthem subitum

MEASLES

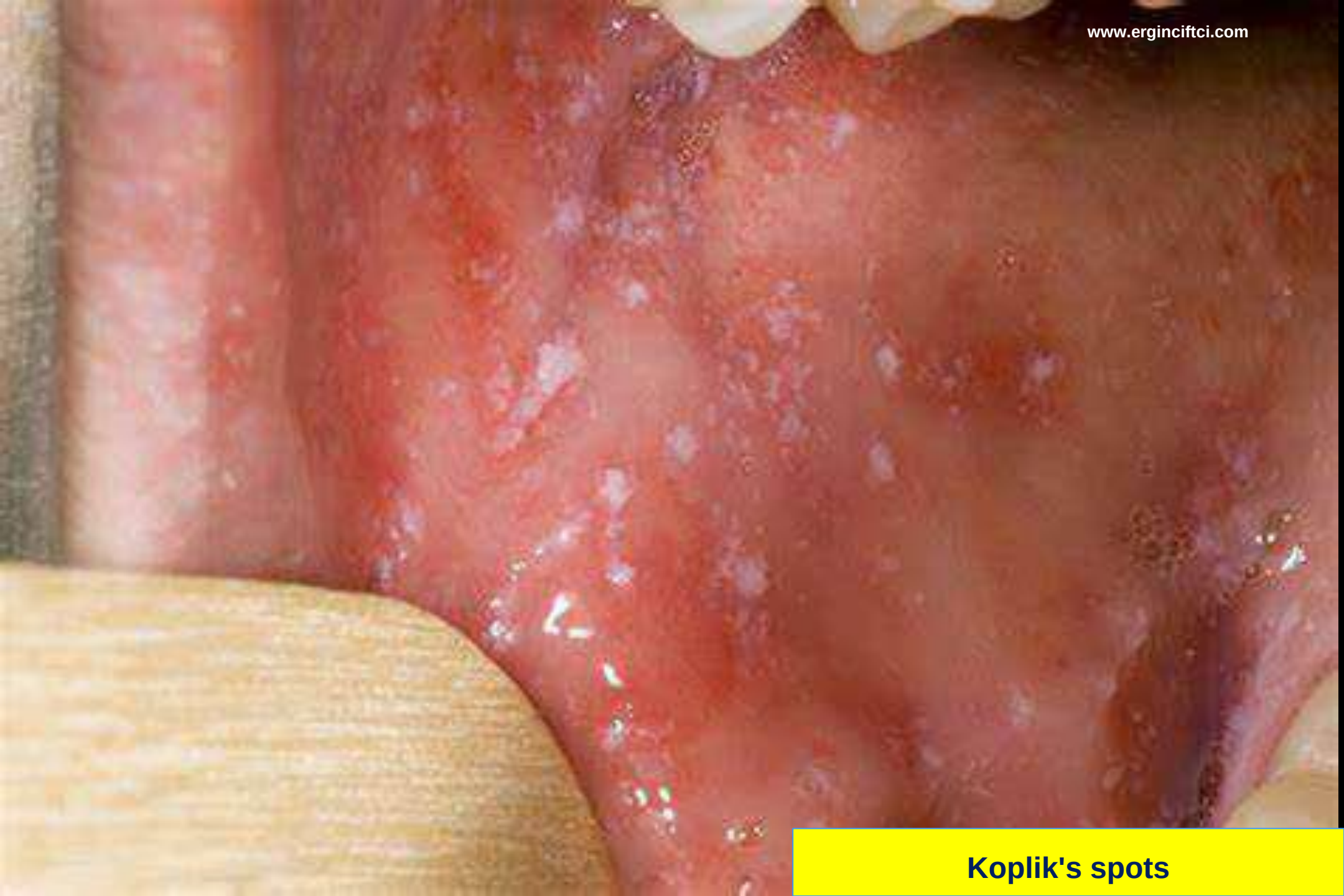
CAUSATIVE AGENT	It is an RNA virus of the Paramyxoviridea family
COMMON AGE	<15 Years
TRANSMISSION	Droplets (Virus uses CD150 and PVRL4 receptors)
INCUBATION PERIOD	8-12 days
PRODROME	Fever, dry cough, rhinorrhea, conjunctivitis, photophobia, Koplik spots

Conjunctivitis

Photophobia



Koplik's spots



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

SECOND DAY

THIRD DAY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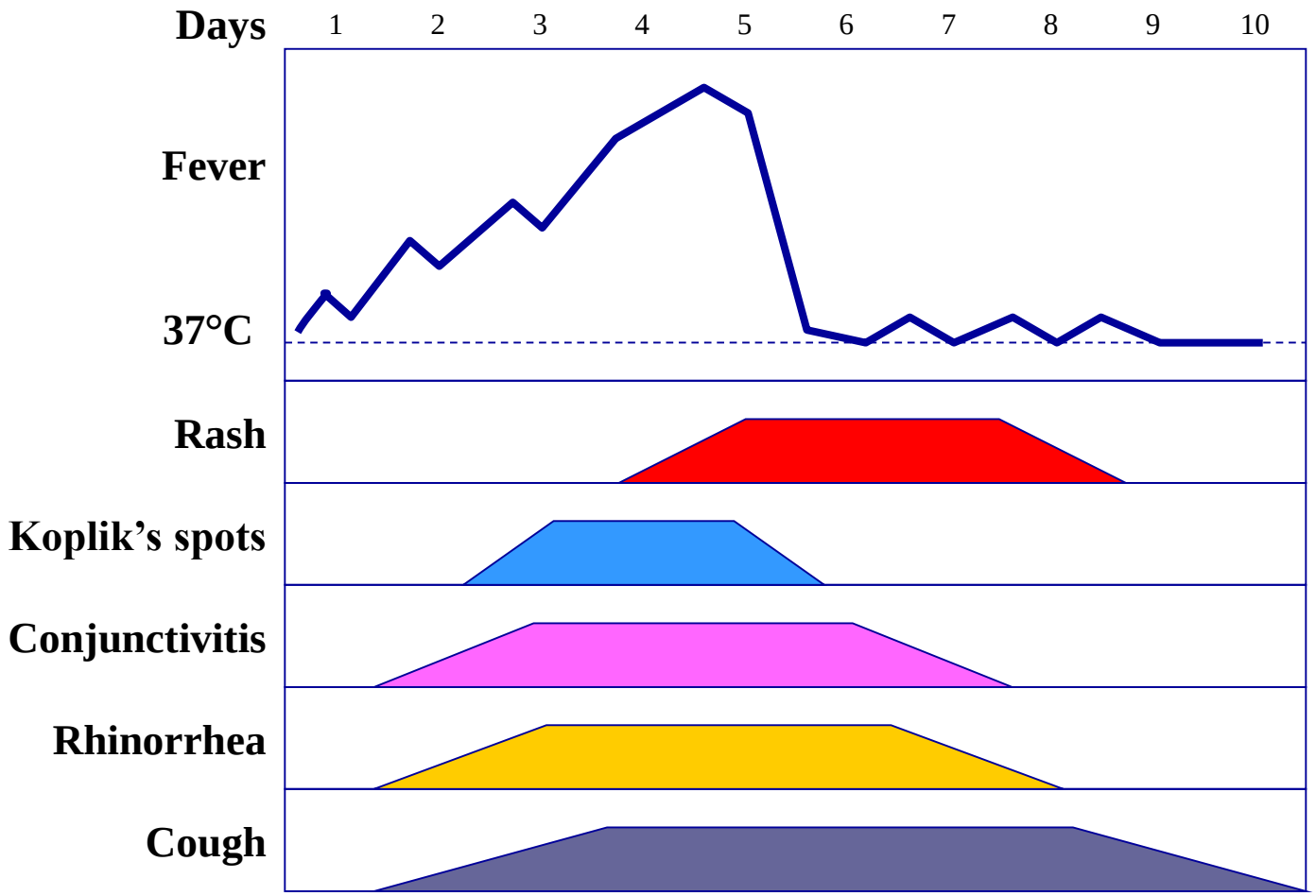
MEASLES



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

04 Eylül 2019

NTV

TÜLAY KARABAĞ

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 karşıtlığı 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 sinsi bir düşman gibi kapımızda" dedi

MEASLES

INFECTIOUS PERIOD	Begins 3 days before rash Lasts up to 4-6 days of rash
PREVENTION	Active immunization: Live measles vaccine MMR at 9th, 12th months and 48th months Protective if given within the first 72 hours after contact Passive immunization: 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 IVIG 400 mg/kg
TREATMENT	Supportive (Paracetamol or Ibuprofen) Vitamine A ≥12 months 200 000 U/day 6-11 months 100 000 U/day <6 months 50 000 U/day 2 days If there is evidence of vitamin A deficiency, a third dose is given after 2-4 weeks.

SCARLET FEVER

CAUSATIVE AGENT	Group A beta-hemolytic streptococcus (*Streptococcus pyogenes*)
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

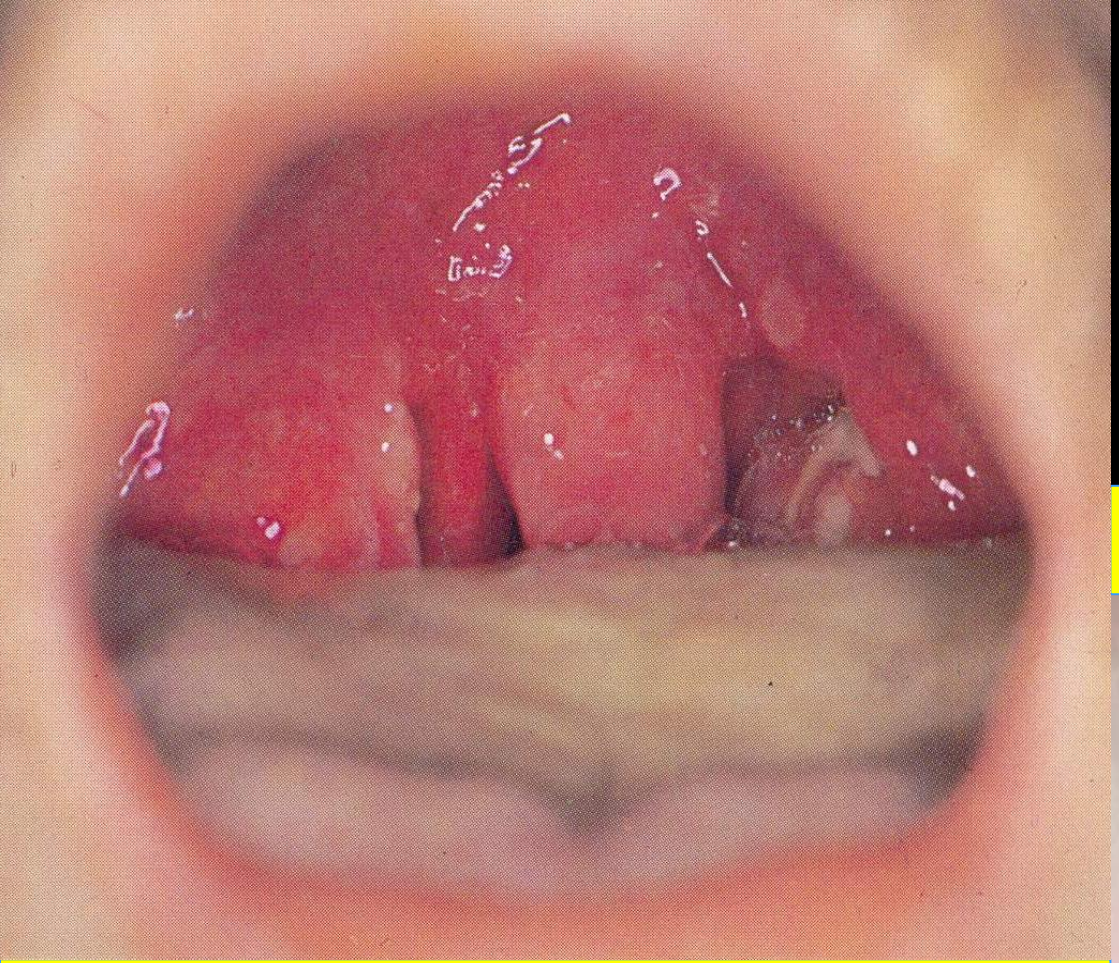
RASH

ENANTHEMA

Tonsils: Hyperemic, hypertrophic, exuding
Pharynx: Edema, hyperemic
Tounge: Strawberry tongue (white and red)
Soft palate: Petechiae

EXANTHEMA

Makuler rash with small papules
Goose skin or Sandpaper-like appearence
Peroral pallor
Pastia lines
Healing with desquamation



Pharyngitis, exudative tonsillitis

Pharyngitis, palatal petechiae

White strawberry tongue

Red strawberry tongue

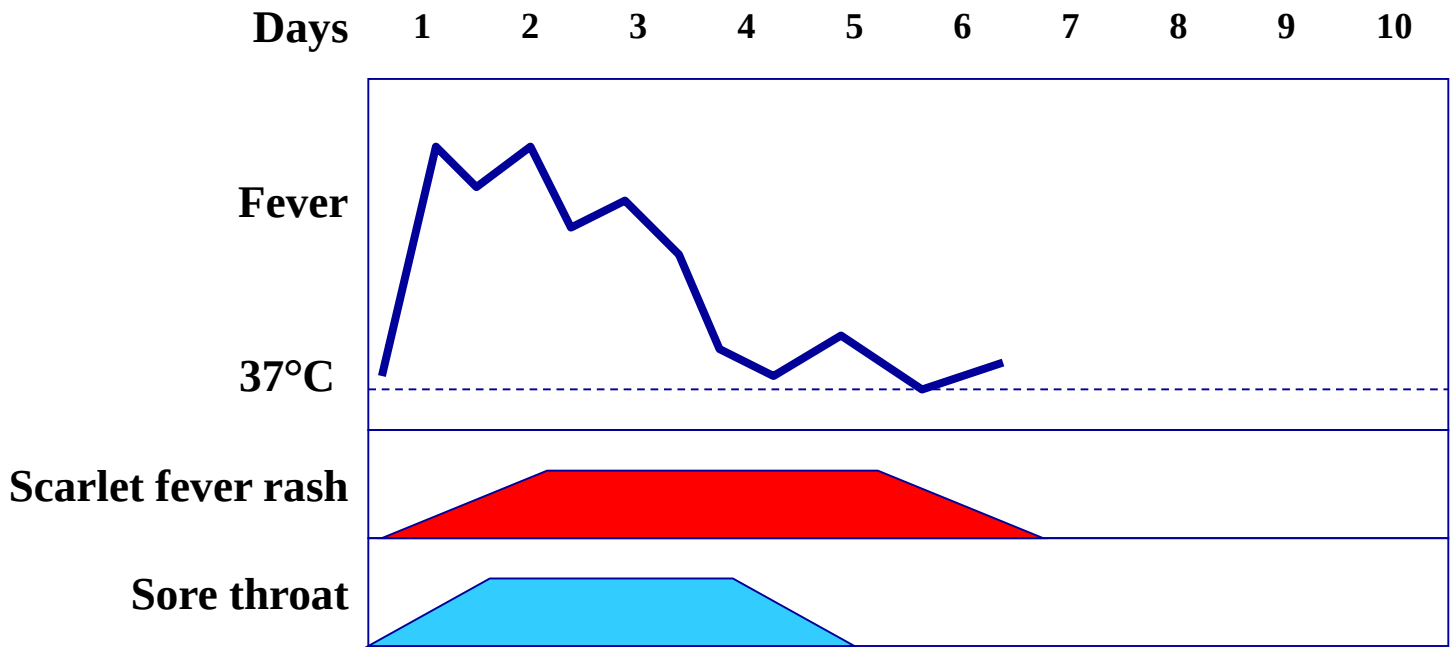
Circumoral pallor

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)

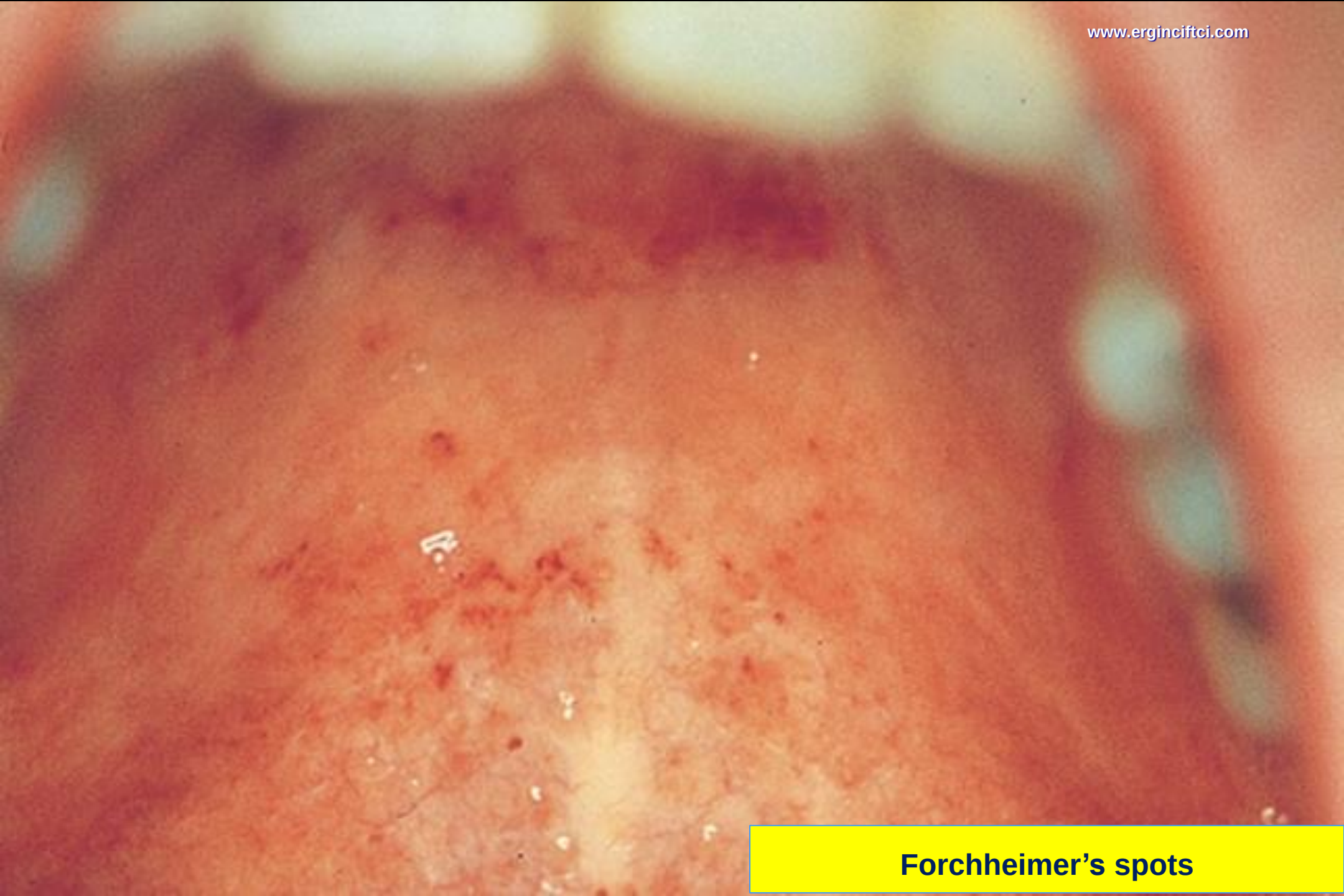
SCARLET FEVER

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	

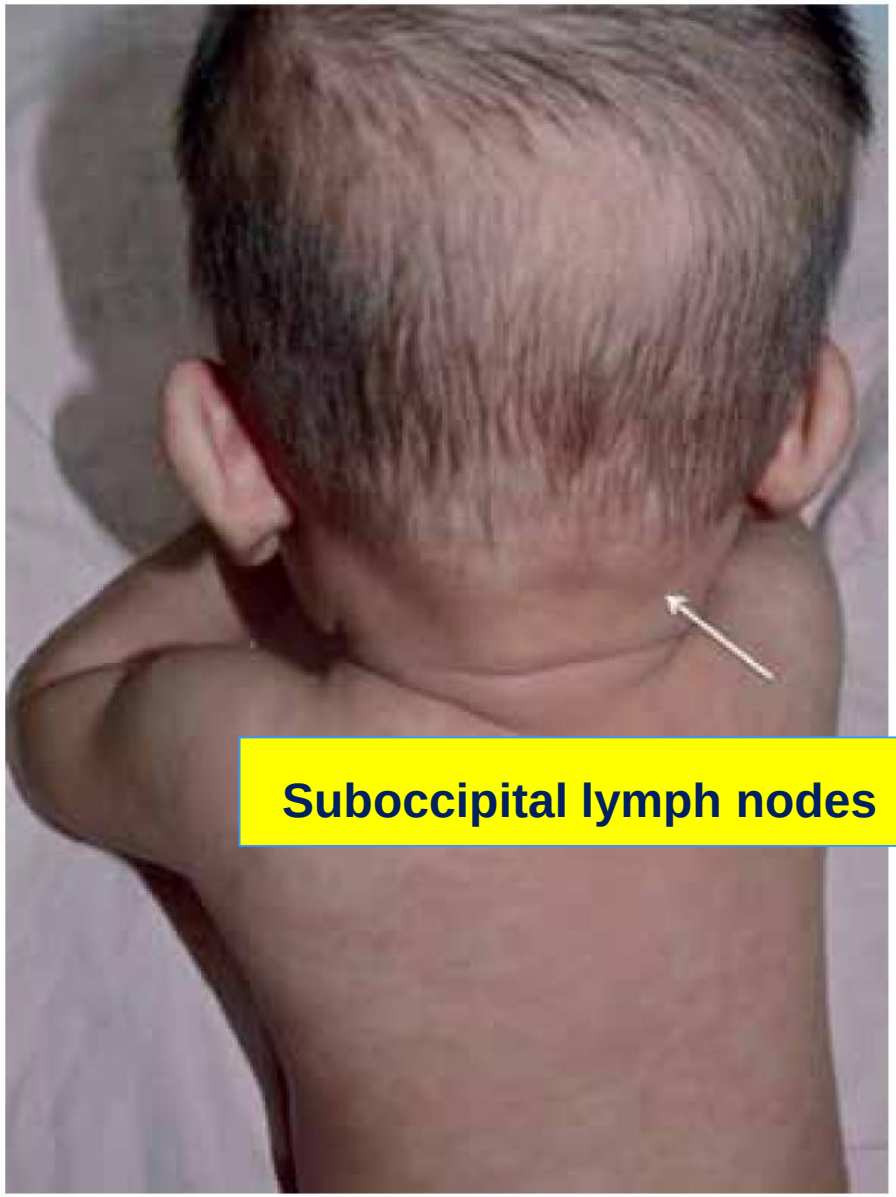
Antibiotic	*Dose*	*Daily dose*	*Route*	*Duration*
Benzathine penicillin G	600 000 U (≤27 Kg) 1 200 000 U (>27 Kg)	1	IM	Once
Penicillin V	250 mg (400 000 U)/dose (≤27 Kg) 500 mg (800 000 U) /dose (>27 Kg)	2-3	Oral	10 days
Amoxicillin	50 mg/kg/dose (max 1000 mg/dose) 25 mg/kg/dose (max 500 mg/dose)	1 2	Oral	10 days

RUBELLA

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



Forchheimer’s spots



Suboccipital lymph nodes

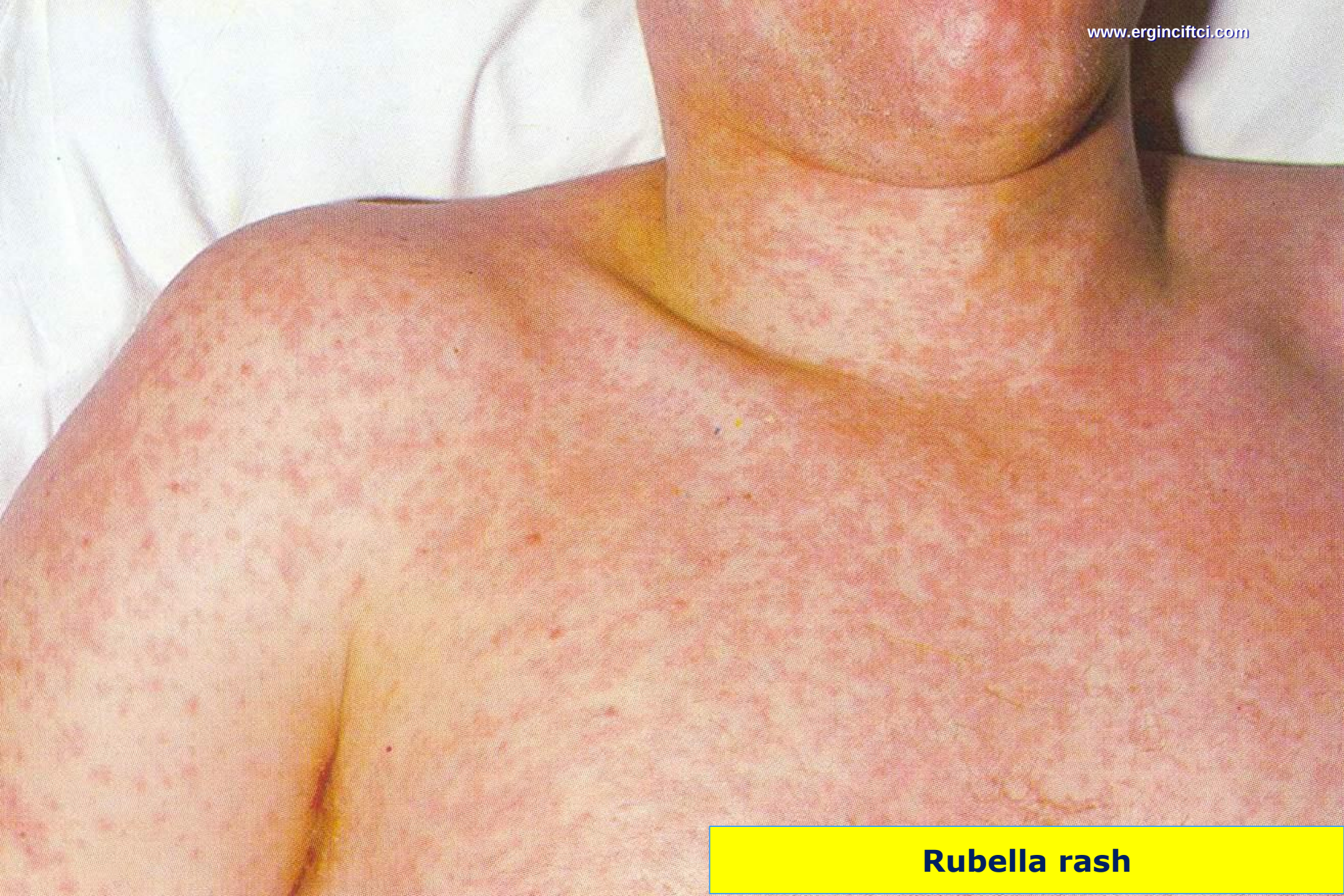
FIG 1. Photograph of a 2-year-old boy with rubella showing bilateral suboccipital lymph nodes and a maculopapular rash on the back. One of the lymph nodes is indicated by a white arrow

Posterior auricular lymph nodes

RUBELLA

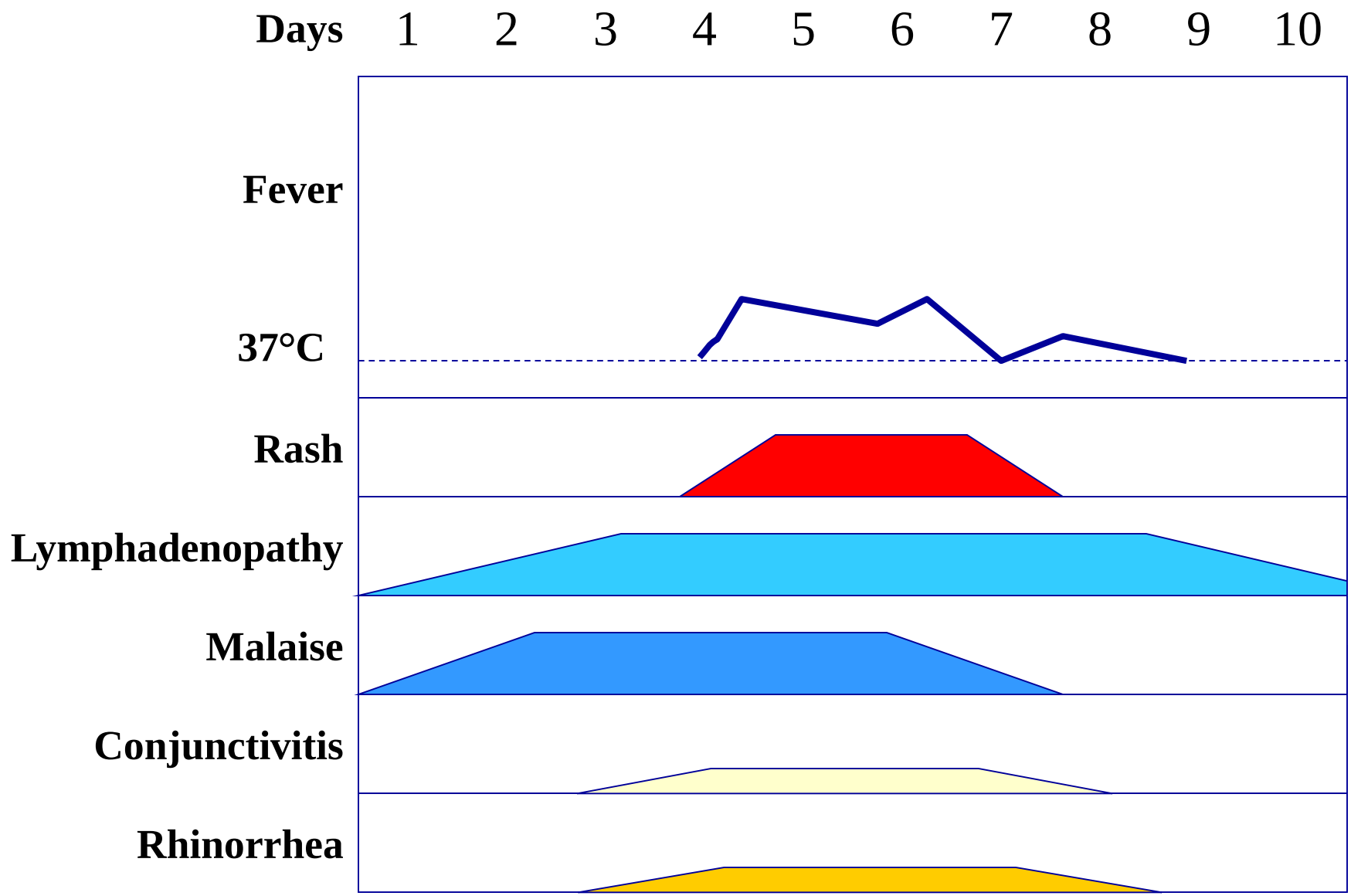
RASH	**The rash starts from the face area.** **However, while rash appear on the trunk,** **the facial lesions disappears.** **Maculopapular rash spread all over the body in 24 hours.** **The rash resembles a scarlet rash on the second day,** **especially on the trunk.** **On the third day, the rash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

Rubella rash



Rubella rash

RUBELLA



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

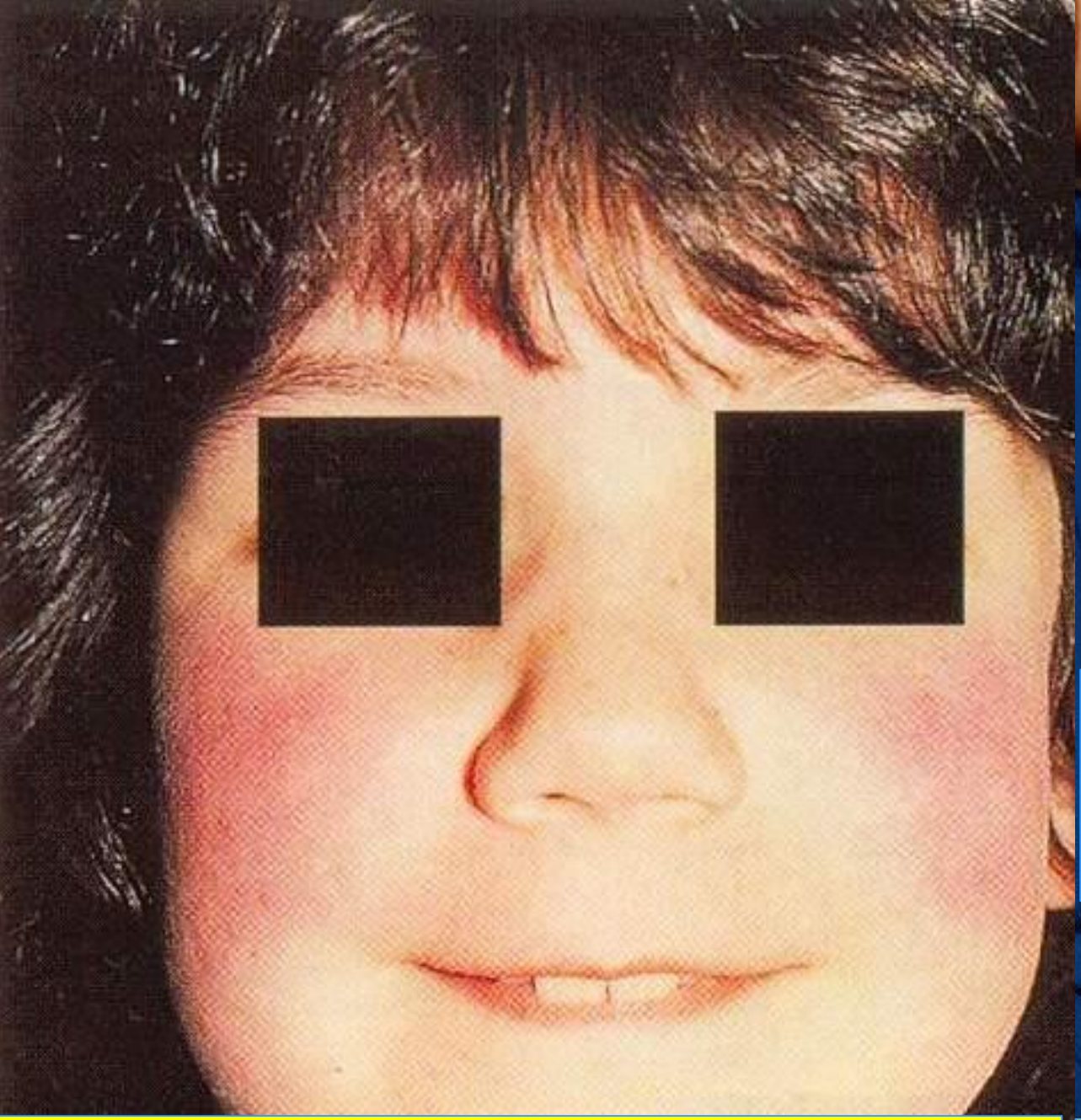
INFECTIOUS PERIOD	***Postnatal rubella*** **Begins 7 days before rash** **Lasts up to 7 days after the rash appears** ***Congenital rubella*** **The newborn can spread the virus with nasopharyngeal secretions and urine for up to 1 year.**
PREVENTION	**Active immunization: Live rubella vaccine (in the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

FIFTH DISEASE
Erythema Infectiosum

CAUSATIVE AGENT	Parvovirus B19
COMMON AGE	5-15 Years
TRANSMISSION	*Postnatal infection* droplet and percutaneous contact with blood *Congenital infection* transplasental
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 apperance)** **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

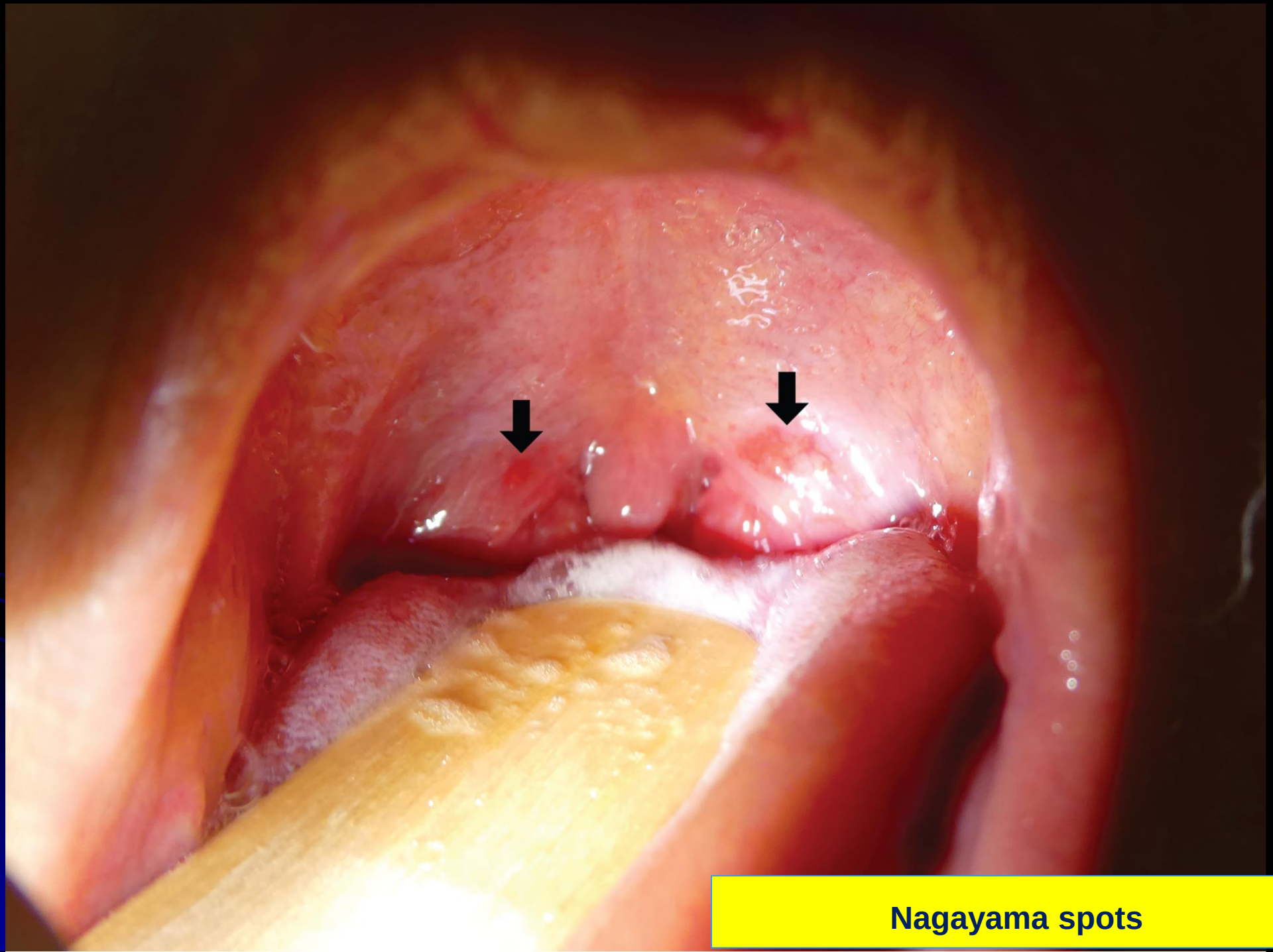
INFECTIOUS PERIOD	**Contagious before the rash appears** **Not contagious after rash begins** **Patients with aplastic crisis contagious for 1 week**
TREATMENT	**Supportive (Paracetamol or Ibuprofen)** **IVIG (In immunocompromised patients with anemia)**

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)**



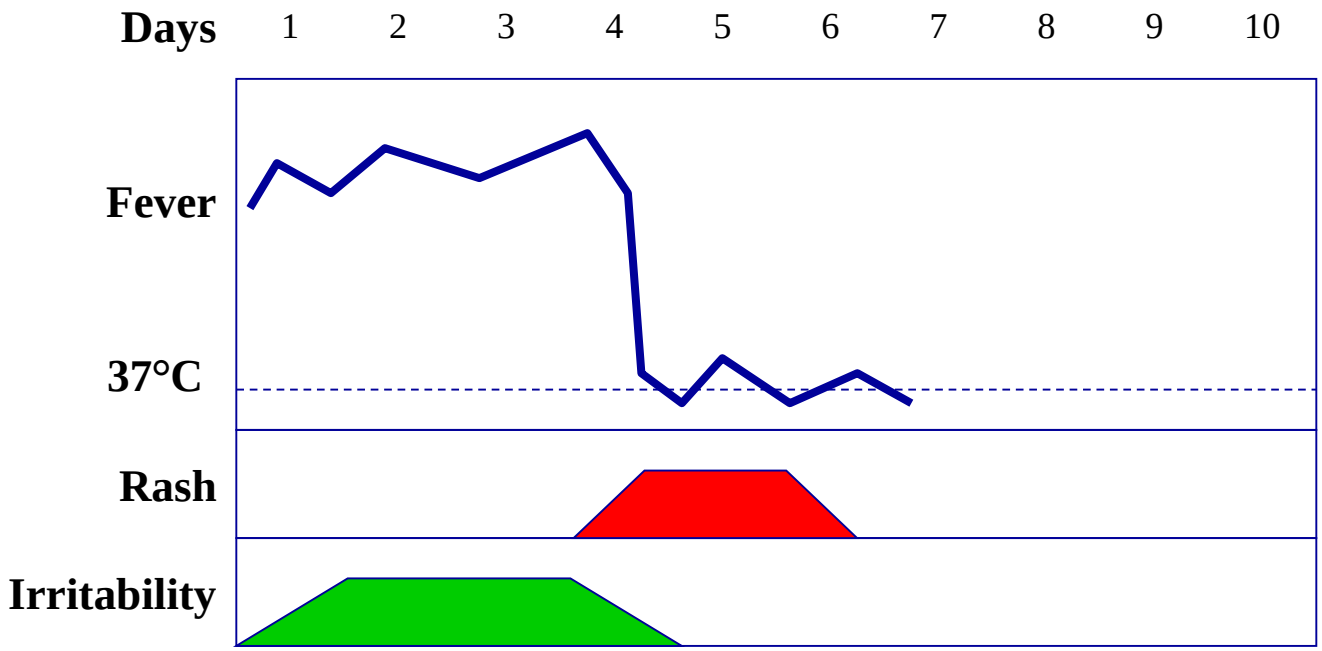
Nagayama spots

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 unnecesary**

CHICKENPOX

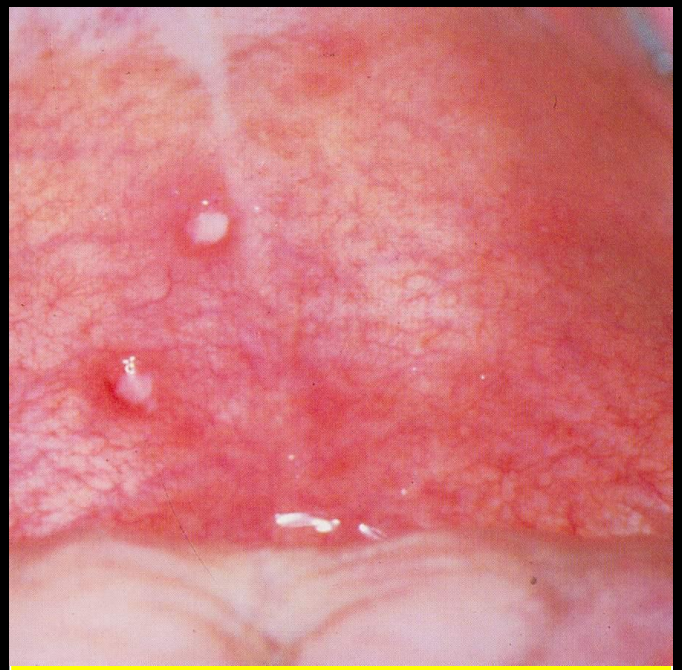
CAUSATIVE AGENT	Varicella-Zoster virus
COMMON AGE	<15 Years
TRANSMISSION	*Postnatal infection* transmitted by droplet and direct contact. *Congenital infection* transplasental transmission
INCUBATION PERIOD	10-21 days (average 14-16 days)
PRODROME	Mild fever, malaise, loss of appetite before 24 hours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

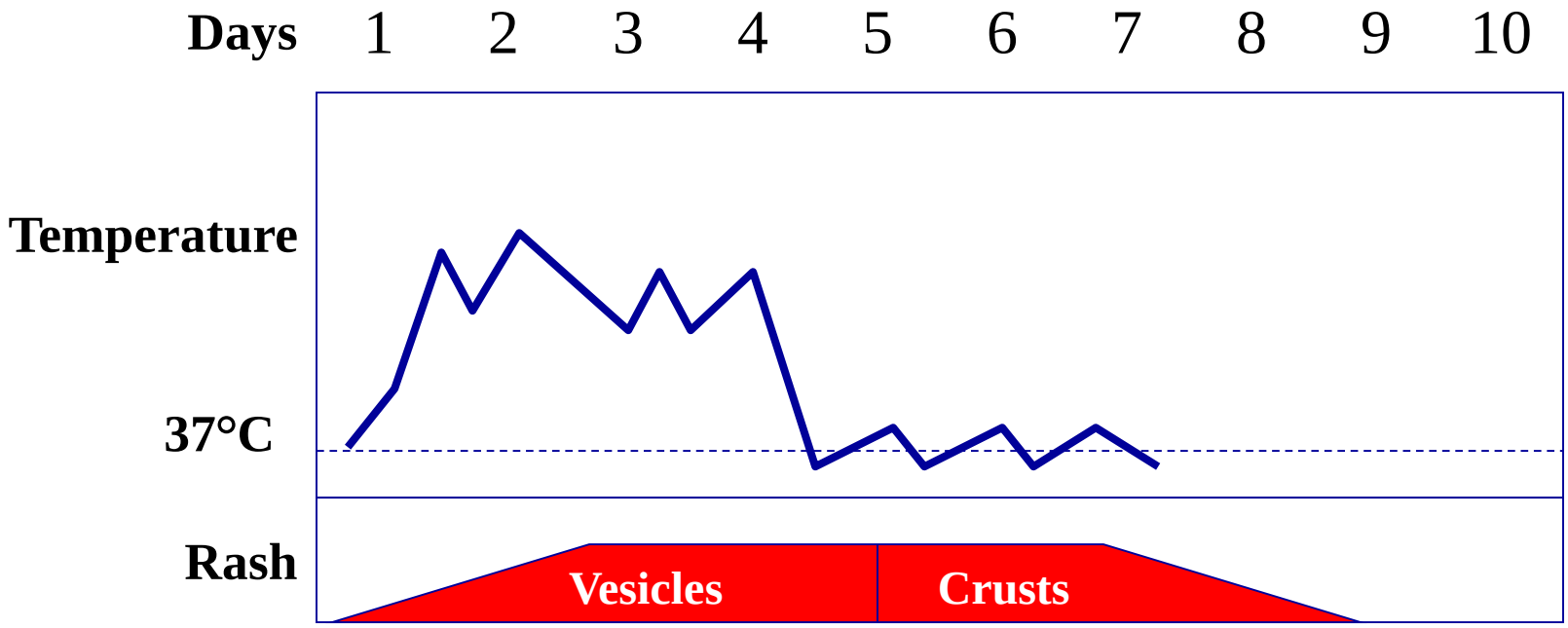
Polimorph rash



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	The last 20 weeks	5 days before delivery 2 days after delivery
		
Congenital varicella syndrome	Herpes zoster in infancy or childhood	Severe varicella infection in newborn
Depends on mother's chickenpox immunity Embryopathy risk ≤2%		

CHICKENPOX
Complications

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

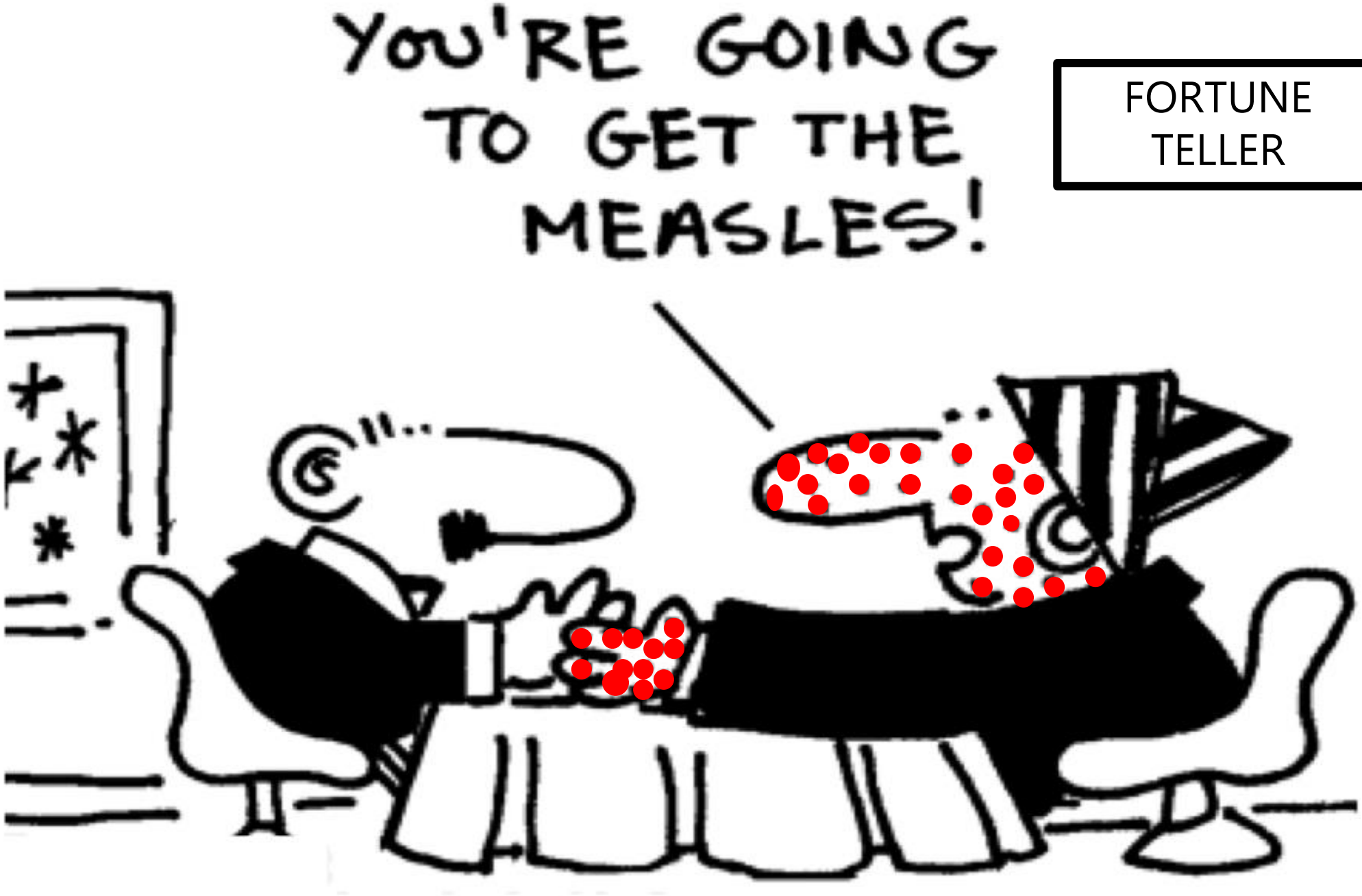
CHICKENPOX
Complications

Cicatricial scarring

Extremity anomaly

CHICKENPOX

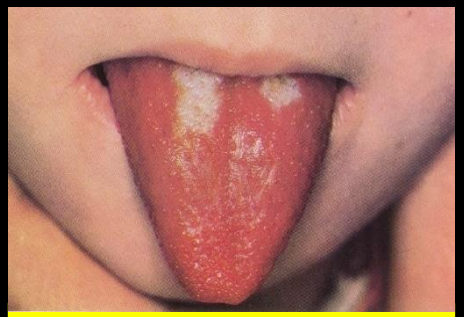
INFECTIOUS PERIOD	**Begins 1-2 days before rash** **Lasts until all the vesicles have crusted**
PREVENTION	**Active immunization: Varicella vaccine. Live-attenuated vaccine.** **Single dose is administered at the age of 12 months.** **2nd dose can be given at 4-6 years old.** **After chickenpox exposure, can be given in the first 3-5 days.** **Passive immunization: Varicella-zoster immune globulin (VZIG)** **After chickenpox exposure, should be given VZIG within the first 10 days.** **IVIG 400 mg/kg**
TREATMENT	**Paracetamol or Ibuprofen (Aspirin is contraindicated! Reye syndrome)** **Acyclovir** **≥13 years old children** **People who are infected by household transmission** **Severe clinical illness** **Chronic skin or lung disease** **Receiving long-term salicylate therapy** **Using aerosol steroids** **Immunodeficiency**


YOU'RE GOING TO GET THE MEASLES!
FORTUNE TELLER

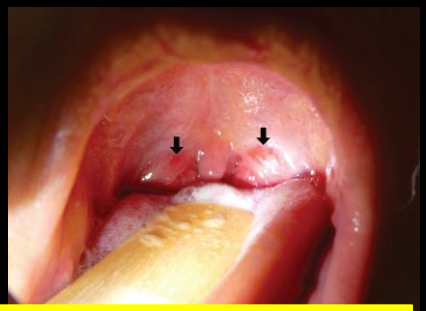
EXANTHEMATOUS DISEASES
Causative Agent

Measles: It is an RNA virus of the Paramyxoviridea family
Scarlet Fever: Group A beta-hemolytic streptococcus (Streptococcus pyogenes)
Rubella: It is an RNA virus from the Togaviridae family.
Fifth Disease: Parvovirus B19 (DNA virus)
Sixth Disease: Human Herpesvirus-6 and 7 (DNA virus)
Chickenpox: Varicella-Zoster virüs (DNA virus)


Koplik's spots


Red strawberry tongue


Forchheimer's spots

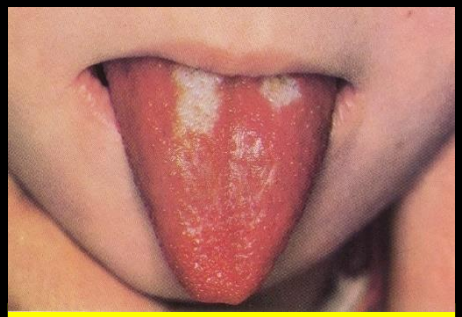

Nagayama's spots


Oral chickenpox lesions

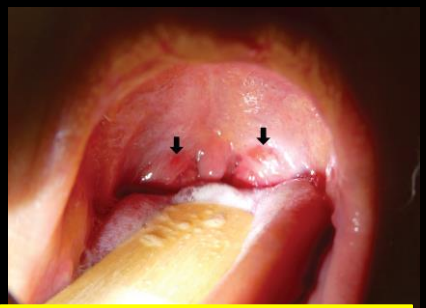
EXANTHEMATOUS DISEASES
Incubation Period

Measles: 8-12 days
Scarlet Fever: 1-7 days (average 2-4 days)
Rubella: 14-21 days.
Fifth Disease: 4-28 days (average 16-17 days)
Sixth Disease: 5-15 days (average 10 days).
Chickenpox: 10-21 days (average 14-16 days)


Koplik's spots


Red strawberry tongue


Forchheimer's spots


Nagayama's spots


Oral chickenpox lesions

EXANTHEMATOUS DISEASES

Prodrome

Measles: Fever, dry cough, rhinorrhea, conjunctivitis, photophobia, Koplik spots
Scarlet Fever: High fever, sore throat, abdominal pain, vomiting
Rubella: Mild fever, headache, malaise, mild rhinorrea and conjunctivitis without photophobia, Lymphadenopathies may be noticed at least 24 hours before the rash Retroaricular, suboccipital, and posterior cervical LAP, Forchheimer's spots
Fifth Disease: It is usually mild, mild fever (15-30%), headache, arthralgia, myalgia
Sixth Disease: High fever lasting 3-5 days, irritability, febrile convulsion
Chickenpox: Mild fever, malaise, loss of appetite before 24 hours from rash

Koplik's spots

Photophobia

Conjunctivitis

Forchheimer’s spots

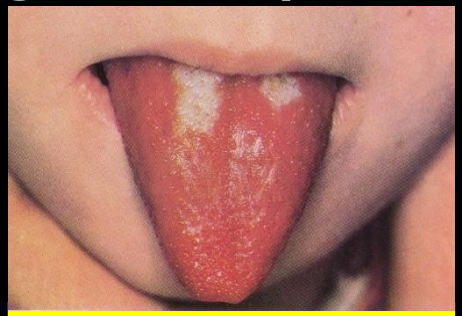
Posterior auricular lymph nodes

EXANTHEMATOUS DISEASES

Rash

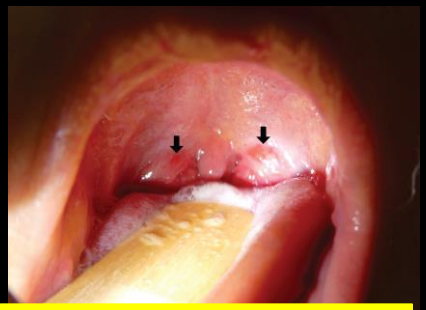
Measles: Begins 3 days before rash, lasts up to 4-6 days of rash
Scarlet Fever: Highest during acute infection, it then subsides and lasts for weeks. With appropriate antibiotic treatment, not contagious after 24 hrs.
Rubella: Begins 7 days before rash, lasts up to 7 days after the rash appears
The newborns with congenital rubella can spread the virus with nasopharyngeal secretions and urine for up to 1 year.
Fifth Disease: Contagious before the rash appears, not contagious after rash begins
Patients with aplastic crisis contagious for 1 week
Sixth Disease: Contagious permanently
Chickenpox: Begins 1-2 days before rash, lasts until all the vesicles have crusted

Koplik's spots



Red strawberry tongue

Forchheimer's spots



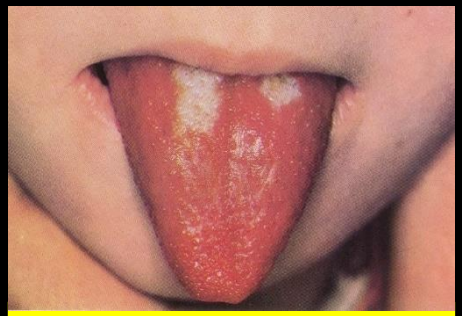
Nagayama's spots

Oral chickenpox lesions

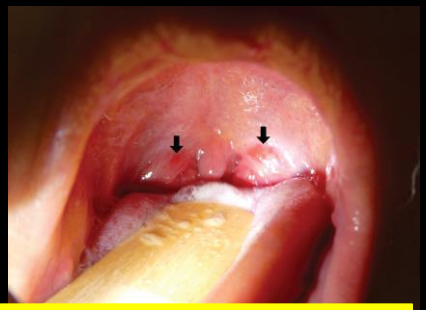
EXANTHEMATOUS DISEASES
Treatment

Measles: Vitamin A
Scarlet Fever: Penicillin
Rubella: None
Fifth Disease: None, IVIG in some cases
Sixth Disease: None
Chickenpox: Acyclovir


Koplik's spots


Red strawberry tongue


Forchheimer's spots

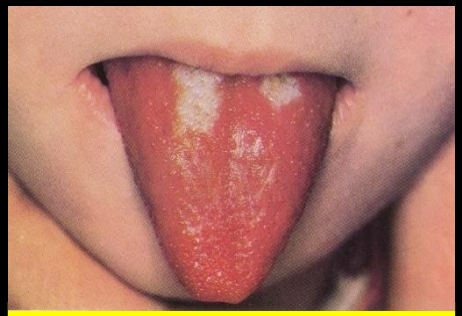

Nagayama's spots


Oral chickenpox lesions

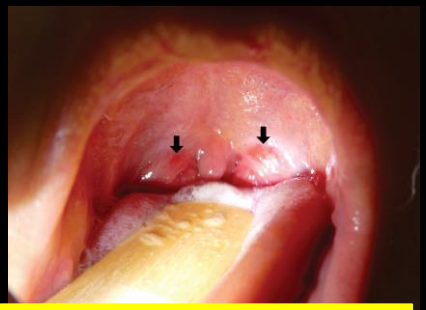
EXANTHEMATOUS DISEASES
Vaccine

Measles: MMR vaccine, MMRV vaccine
Protective if given within the first 72 hours after contact
Scarlet Fever: None
Rubella: MMR vaccine, MMRV vaccine
Fifth Disease: None
Sixth Disease: None
Chickenpox: Varicella vaccine
After chickenpox exposure, can be given in the first 3-5 days.


Koplik's spots


Red strawberry tongue


Forchheimer's spots

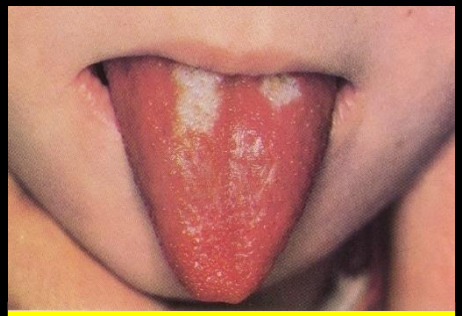

Nagayama's spots


Oral chickenpox lesions

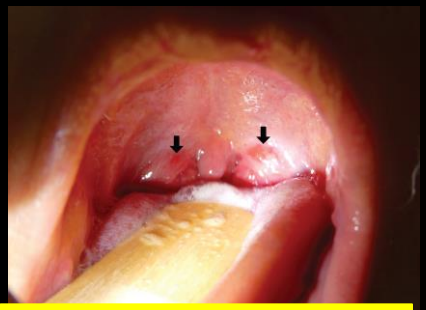
EXANTHEMATOUS DISEASES
Immunglobulin for Prevention

Measles: Yes. Protective if given within the first 6 days of exposure
Scarlet Fever: None
Rubella: Yes (Only for pregnants)
Fifth Disease: None
Sixth Disease: None
Chickenpox: IVIG, VZIG (For immunocopromised children and adults)
Protective if given within the first 10 days of exposure


Koplik's spots


Red strawberry tongue


Forchheimer's spots


Nagayama's spots


Oral chickenpox lesions