Common Childhood Infectious Diseases

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Definitions

Exanthem: A skin eruption occurring as a symptom of a general disease.

Enanthem: Eruptive lesions on the mucous mb

Causes of fever and rash

Doctor went through all of them

Classification depend on the type of rash :

Maculopapular rash

Viral	HHV6 or 7 (Roseola infantum) – <2 years old
	Enteroviral rash
	Parvovirus ('slapped cheek') – usually school-age
	Measles – uncommon if immunised
	Rubella – uncommon if immunised
Bacterial	Scarlet fever (group A streptococcus)
	Erythema marginatum – rheumatic fever
	Salmonella typhi (typhoid fever) – classically rose spots
	Lyme disease – erythema migrans
Other	Kawasaki disease
	Juvenile idiopathic arthritis

↑ Other name to HHV

(one of the major symptoms = RF)

↓ In north America

Vesicular, bullous, pustular

Viral	Varicella-zoster virus – chickenpox, shingles
	Herpes simplex virus
	Coxsackie – hand, foot and mouth
Bacterial	Impetigo – characteristic crusting Honey crust
	Boils – infection of hair follicles/sweat glands
	Staphylococcal bullous impetigo
	Staphylococcal scalded skin
	Toxic epidermal necrolysis
Other	Erythema multiforme; Stevens–Johnson syndrome

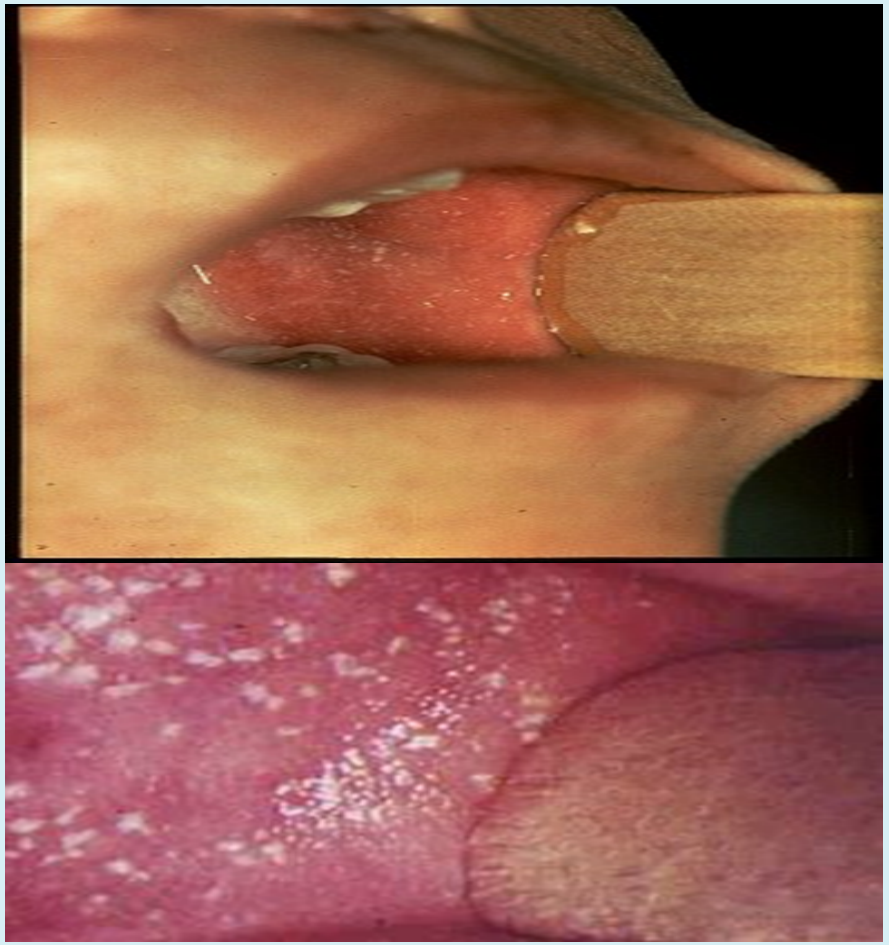
Petechial, purpuric

Bacterial	Meningococcal, other bacterial sepsis
	Infective endocarditis
Viral	Enterovirus and other viral infections
Other	Henoch–Schönlein purpura (HSP)
	Thrombocytopenia
	Vasculitis
	Malaria

Classic Childhood Exanthems

Common rashes:

- Measles (Rubeola)
- Scarlet Fever
- Rubella (German measles) Other name
- Erythema Infectiosum (fifith disease), Parvovirus B19 Other name: 5th , caused by : Parvovirus
- Roseola Infantum



- Pt looks unwell
- Redness of the eye
- There is coryza symptoms;

(nasal congestion and discharge)

Buccal mucosa shows whitish Enanthem spots which are called **Kopliks spots** → one of the features of measles

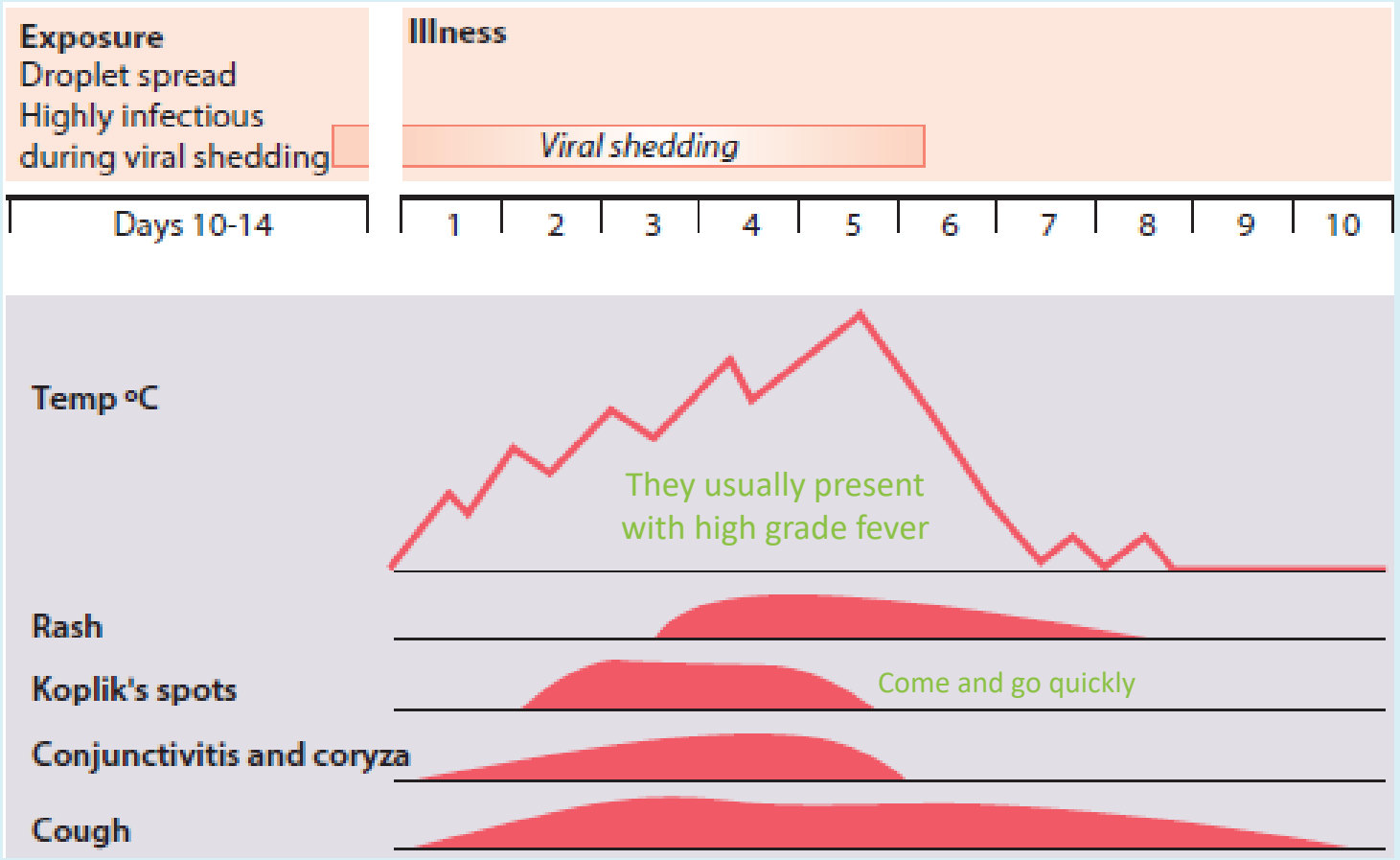
Maculopopular rash
Some are adjacent while other are distant from each other

Measles (الحصبة)

- Paramyxovirus
- At risk: children who are not yet vaccinated or who miss vaccination (+parent who keep delaying the vaccine for there children)
- Incubation period: 10-14 days
- Infectious period: 1-2d before prodrome to 4 days after onset of rash (prodrome; coryzal sx, redness of the eye and other sx)

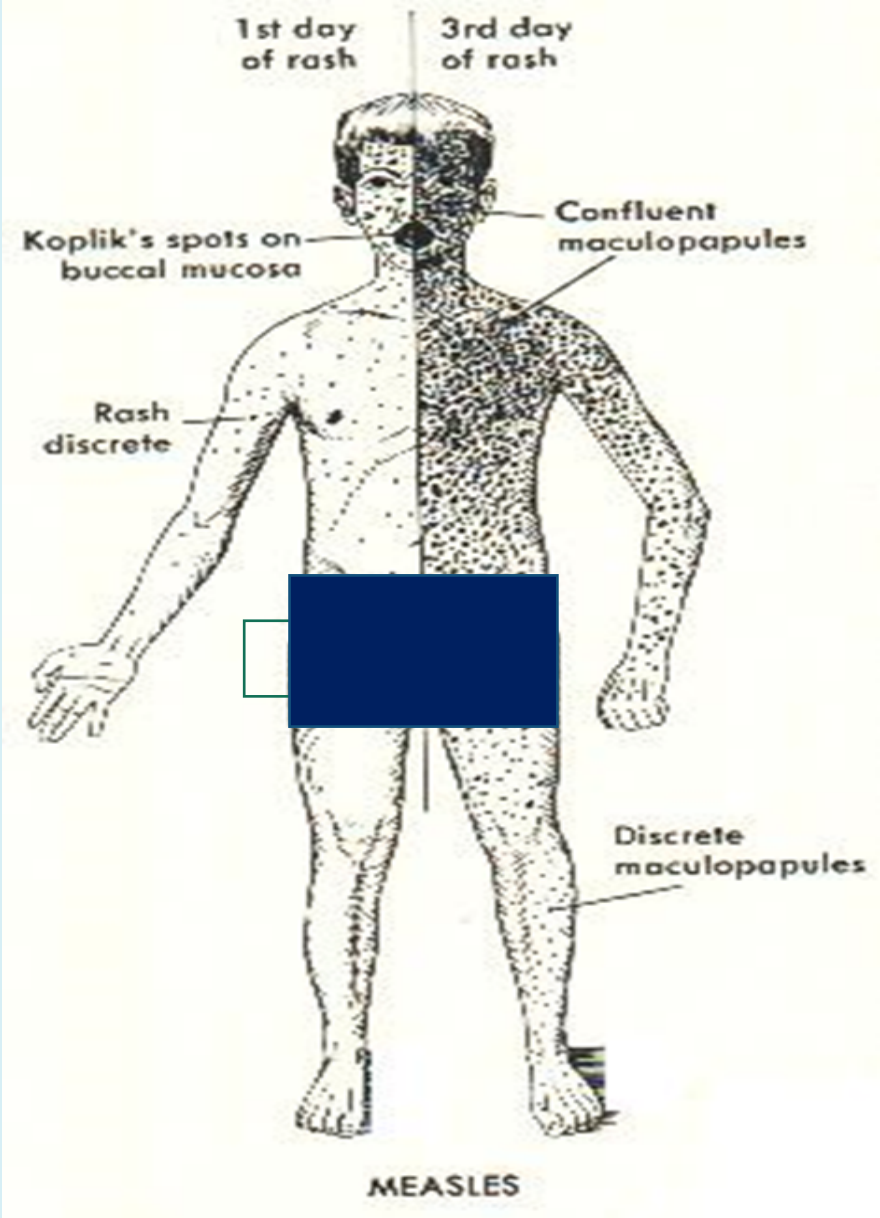
Measles clinical features

High chance to get the disease in this stage if your not immune
↓



Initial sx : cough + conjunctivitis + coryza
Then Koplik spot
Lastly Rash

Sx start from up (the face) then the rash start to descent downward
Always ask the parent **where did the rash started ?**



Symptoms

- Prodrome: day 7-11 after exposure
  - Fever, cough, coryza, conjunctivitis
  - Enanthem: Koplik's spots appear 2 days before the rash, last 2 days into the rash
- rash spread downwards from face
- Highly contagious
- Treatment: symptomatic, Vitamin A → Reduce the complication
- **Prevention** 2 doses of measles vaccine
- Immunize susceptible contacts, Immune globulin

  If someone get contact with measles case and he WASNOT immunize → give immunoglubin

Measles: complications

- Otitis media
- Bronchopneumonia (very sever)
- Encephalitis
- Myocarditis
- Pericarditis
- Subacute sclerosing panencephalitis SSPE—late sequelae due to persistent infx of the CNS (may come up to 10 yrs)

White strawberry tongue

Red strawberry tongue

Small discrete rash (not as measles adjacent)

Peeling of the skin on finger tip

Patichea on the soft palate

Scarlet Fever

- Due to erythrogenic exotoxin-producing

Group A beta-hemolytic streptococci

- Peak age: 4-8 yr
- Incubation period: 2-5 days

Scarlet Fever

- Abrupt onset fever, headache, vomiting, malaise, sore throat
- Bright red oral mucosa
- Palatal petechiae
- Tongue change

- Rash appears 1-2 days after the onset of illness
- Described as "sandpapery" in quality → You can feel the rash better than seeing it
- Can last for over a week
- As the rash fades, peeling (desquamation) may occur (finger tips, toes, and groin area) Imp three area

Treatment: penicillin

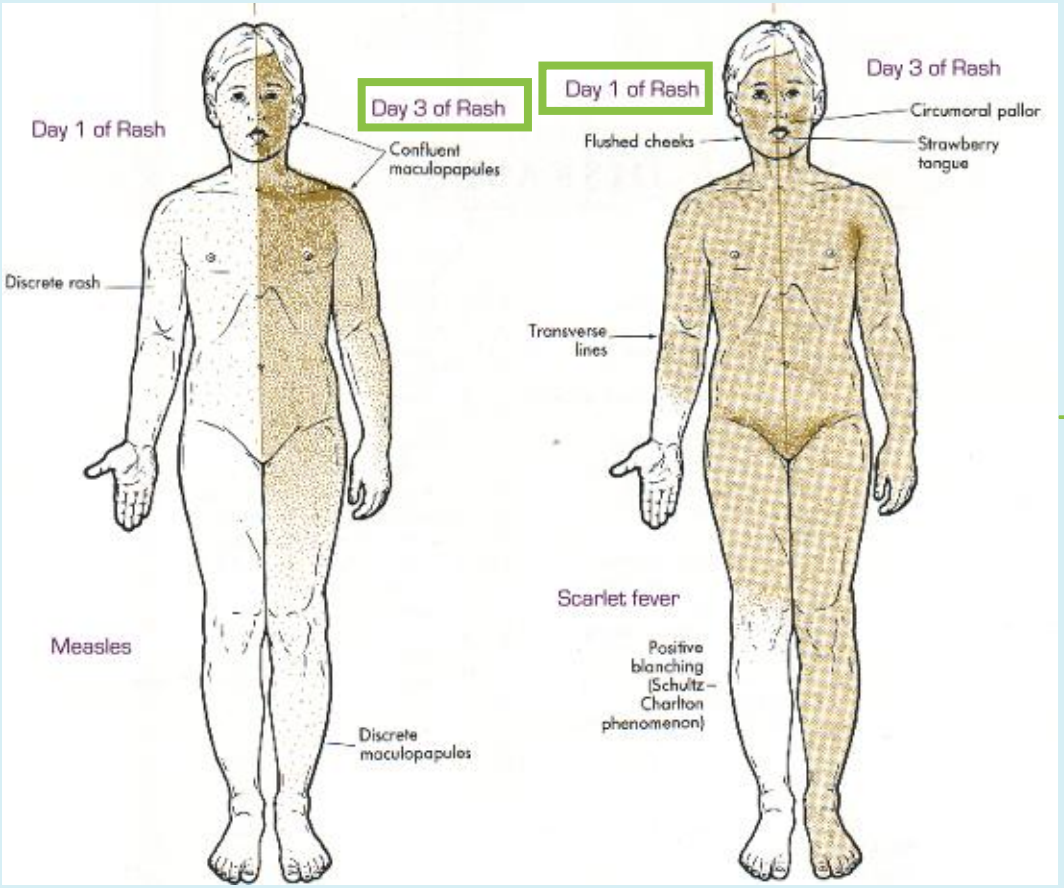
or erythromycin if there is penicillin allergy

for 10 days

Measles versus Scarlet fever

Rash start on face then descending pattern

+start after while



Rash discrete all over the body specially in the folds area

+ circumoral pallor (cuz the rash will be over cheek)

+ start From day 1

Scarlet Fever: complications

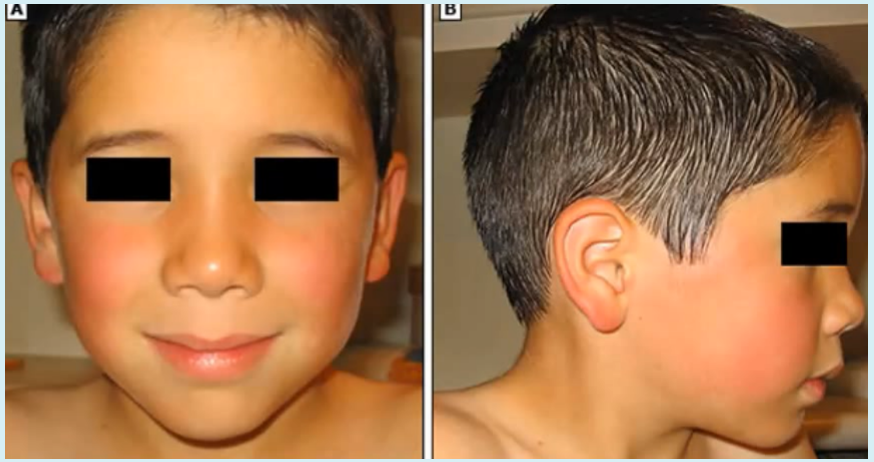
Purulent complications:

- Otitismedia
- Sinusitis
- Peritonsillar/retro-pharyngeal abscesses Require drainage
- Cervical adenitis

Nonsuppurative sequalae:

- Rheumatic fever
- Acute glomerulonephritis

Swelled Red cheeks; like slapped cheeks



Face: Redness of the cheek
Body : lace like (net like) rash

Fifth Disease Erythema Infectiosum (Human Parvovirus)

Raised, red, warm rash, first appearing on cheeks (slapped cheek appearance).

After 1 - 4 days, a lace-like rash spreads to the rest of the body.

- **Infectiousness** greatest before onset of the rash and not after the rash. After rash his no more infectious he can go to school
- **Control** In school outbreaks, alert pregnant staff. Causes hydrops fetalis
- In pts hemolytic anaemia (e.g SCA) Causes aplastic crises
- Treatment: supportive Except high risk pt

Roseola infantum (exanthema subitum)

Caused by Human Herpesvirus-6

They will present with fever fever fever lastly rash

Chicken box

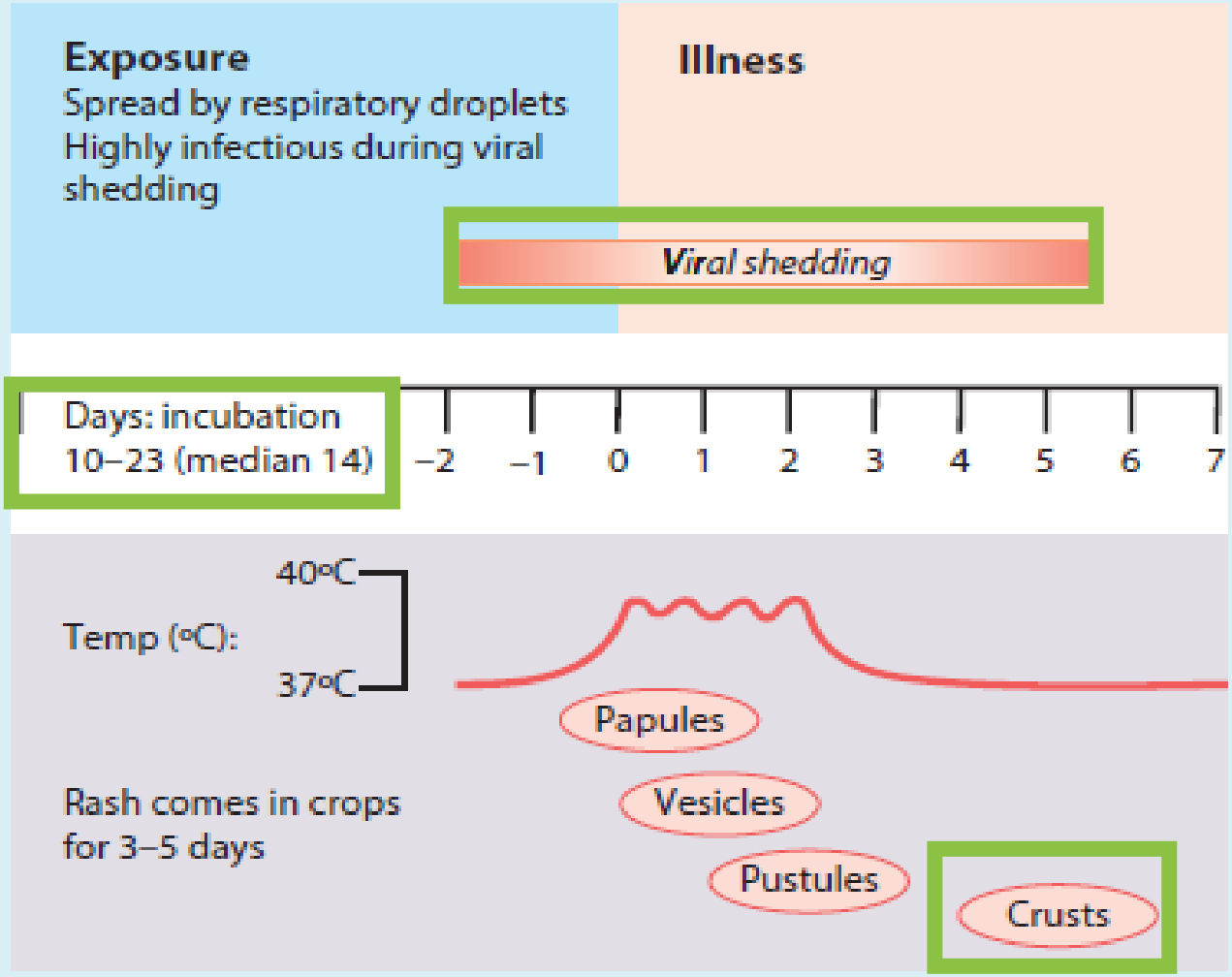
Zooster

Character of chicken box rash is your going to have all stages of rash

Chicken Pox (Varicella)

- DNA Virus
- Incubation Period: 10 – 21 days
- Very contagious; can be spread by direct contact, airborne transmission Stay suspended in the air
  ↓ Viral is active and is replicating in the body
- Infectivity: 1-2 days before rash till all skin lesions have crusted (~ 6th day of rash)
- Vaccine Many pt don't take it, that's why it is common

Varicella

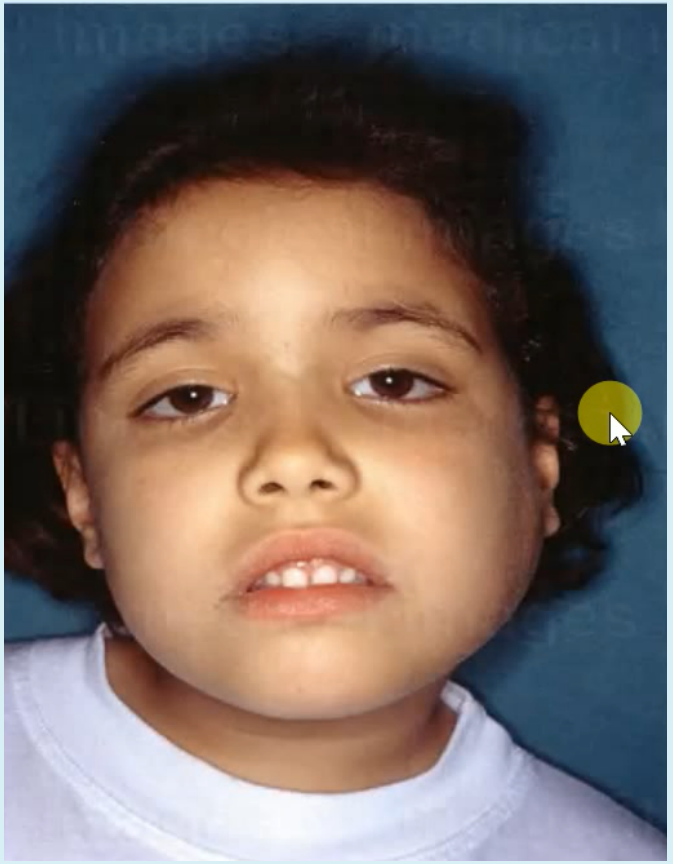


Incubation days → viral start shedding (infectious stage) until crustation happen → become un infectious

Complications

- Secondary infection of the blisters may occur If colonize with any staph, strep
- pneumonia, myocarditis
- Cerebellar ataxia may appear during the recovery phase or later
- Encephalitis (rare)
- Congenital infection
- Newborns are at risk for severe infection (if mother is not immune)
- Disseminated dis: immunocompromised Very severe
- Treatment: Acyclovir

Neonatal varicella with secondary bacterial infection



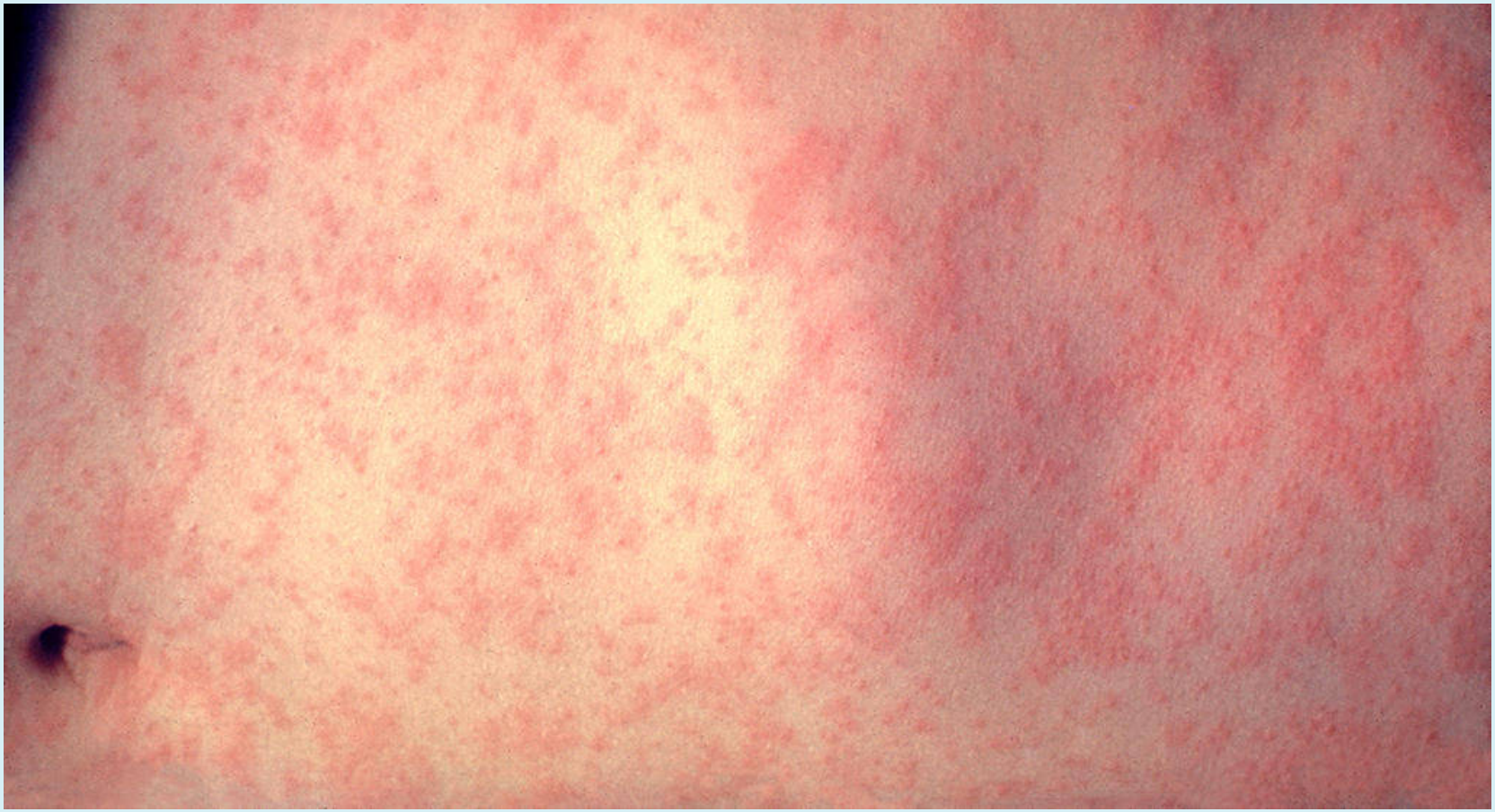
Mumps → due to bilateral enlarge parotid swelling

Mumps

- RNA Virus
- Incubation Period: 15 – 24 days
- Clinical Features: fever, parotitis, may be subclinical
- Complications: meningitis, encephalitis, orchitis In male
- Treatment
- Isolation & Infectivity: 7 days after onset of parotid swelling.
- Vaccine Help in Prevention

Rubella

- RNA Virus
- Incubation Period: 15 – 20 days
- Spread by respiratory droplet.
- generally a mild disease in childhood, Lymphadenopathy particularly the occipital and postauricular nodes, is prominent, arthralgia and arthritis.
- Serious in pregnancy: cong. infection
- Treatment
- Isolation & Infectivity: 7 days from onset of rash
  - Congenital Rubella: until 1 year of age
- Vaccine



Discrete maculopopular rash of rubella

Congenital rubella syndrome

- Infection of seronegative mother during pregnancy
- Risk of fetal infection

  First trimester : 75-90%

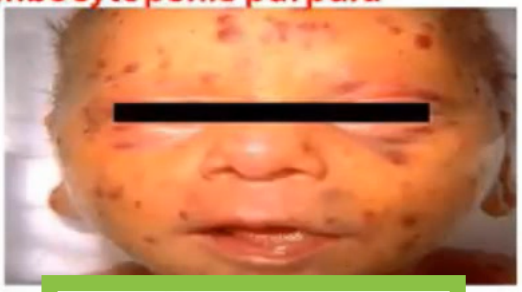
Congenital Rubella

Crosses placenta when mother has acute infection.

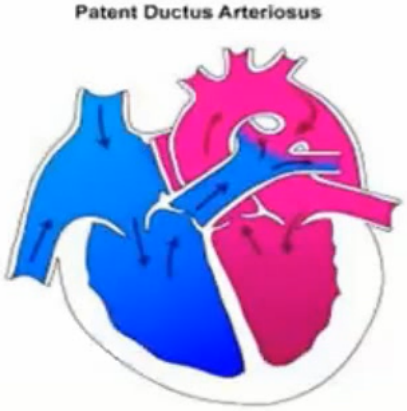
The earlier the fetus is infected -> more serious disease.

May result in serious congenital abnormalities

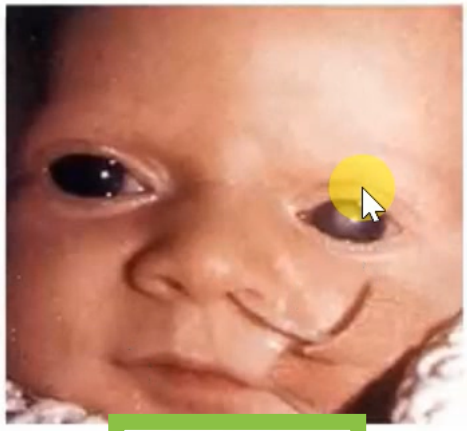
- Intrauterine growth retardation
- Hepatosplenomegaly
- Cataracts
- Mental retardation
- Sensorineural hearing loss
- Heart- Patent ductus arteriosis
- Pulmonary stenosis
- Thrombocytopenic purpura



Blueberry Muffin Rash



PDA

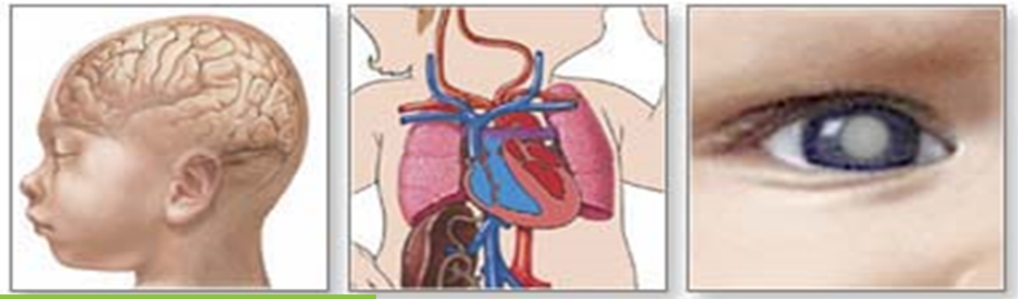


Cataracts

Classic triad:

- PDA
- Cataracts, and deafness
- +/- "blueberry muffin" rash

Rubella syndrome



Microcephaly PDA Cataracts

A.D.A.M.

→ Blueberry rash

MCQ

14-year-old girl,unvaccinated, presented with sore throat, low-grade fever, and a diffuse maculopapular rash. During the next 24 hours, she develops tender swelling of her wrists. In addition, her physician notes mild tenderness and marked swelling of her posterior cervical and occipital lymph nodes. Four days after the onset of her illness, the rash has vanished. Which of the following is the most likely diagnosis?

a. Rubella

b. Rubeola

c. Roseola

d. Erythema infectiosum

e. Erythema multiforme

Ans : A

Enterovirus infection

Nonpoliovirus)
and Parechovirus Infections
(Group A and B Coxsackieviruses, Echoviruses,
Numbered Enteroviruses, and Human
Parechoviruses)

The most common manifestation of enteroviruses is nonspecific febrile illness

- Other manifestations can include the following:

(1) respiratory: coryza, pharyngitis, herpangina, stomatitis, bronchiolitis, pneumonia.

↓

Vesicular lesion present on mucus of the mouth

(2) skin: handfoot-and-mouth disease, and nonspecific exanthems.

(3) neurologic: aseptic meningitis, encephalitis, and motor paralysis

(4) gastrointestinal: vomiting, diarrhea, abdominal pain, hepatitis, pancreatitis.

(5) eye: acute hemorrhagic conjunctivitis and uveitis

(6) heart: myocarditis

(7) muscle: myositis Muscles become tender

Sole of the foot

In **summer** (the peak) we see it usually as cluster

Hand foot mouth disease

Painful Lesion of the mouth

Hand-Foot-and-Mouth Disease

- Coxsackievirus infection
- Usually a mild illness
- Generally complete recovery occurs in 5-7 days

Complications:

- Dehydration may occur
  - mouth lesions cause pain with swallowing

Herpes simplex virus 1

most common sites are lips and fingers or thumbs (herpes whitlow)

On the mouth:
It can present as Gingival stomatitis
Few lesion or severe many lesion

Few lesions

Sever painful lesion with dehydration

Herpetic whitlow → lesion on the finger

Herpes simplex virus infection

- **Herpes** “cold sores”
- **Symptoms** Superficial clear vesicles (blisters) with red base, usually on face or lips, which crust and heal within days.
- **Method of transmission** Direct contact
- avoid contact with children with eczema or burns and the immunocompromised. Present with complication

Herpes simplex virus infection

- Gingivostomatitis – may necessitate, intravenous fluids and aciclovir

Eczema pt may have →

- Eczema herpeticum – may result in secondary bacterial infection and septicaemia
- Herpetic whitlows – painful pustules on the fingers
- Eye disease - - blepharitis, conjunctivitis, corneal ulceration and scarring
- CNS – aseptic meningitis, encephalitis
- Pneumonia and disseminated infection in the immunocompromised.

= Sever lesion

Herpes with eczema

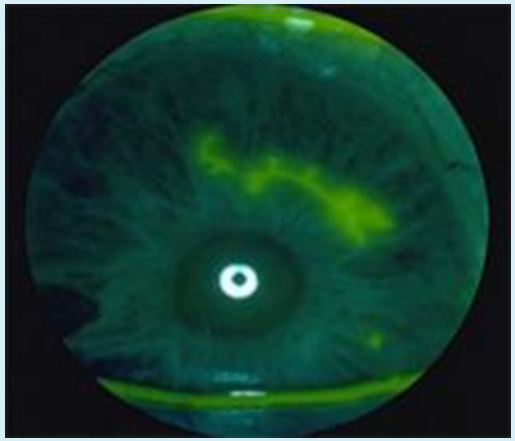
Herpes with eye involvement = Emergency call Optha

Eczema herpeticum
(sever involvement)

Eczema herpeticum (kaposi varicelliform eruption)

- serious condition, emergency care
- Widespread vesicular lesions develop on eczematous skin
- This may be complicated by secondary bacterial
- infection, which may result in septicaemia
- high fever, irritability, lesions then rupture and crust over the course of a couple of days
- Lesions can become hemorrhagic
- If area of involvement is large, can be lots of fluid loss and potentially fatal
- Treat promptly with acyclovir Large → IVF is required

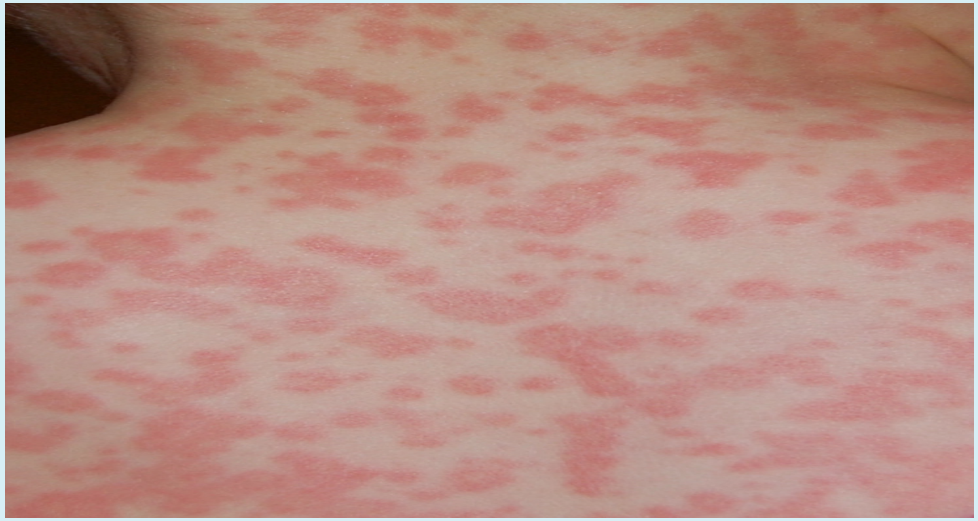
Always lesion around eyes – CALL OPTHA



→ Dendritic ulcers in herpetic keratitis

Infectious Mononucleosis

Cause: Epstein-Barr virus and Cytomegalovirus



Maculopopular rash

Bilateral large tonsils with white patches

Bilateral cervical lymph node Involvement

- Enlarged lymph nodes
- Rash
  - Pink, measles-like rash
    - more common if given amoxicillin for throat infection
- Enlarged spleen & liver
- transmitted by saliva and close contact
- Diagnosis: serology, PCR
- Treatment is usually supportive, unless immunocompromised, where antiviral is indicated.

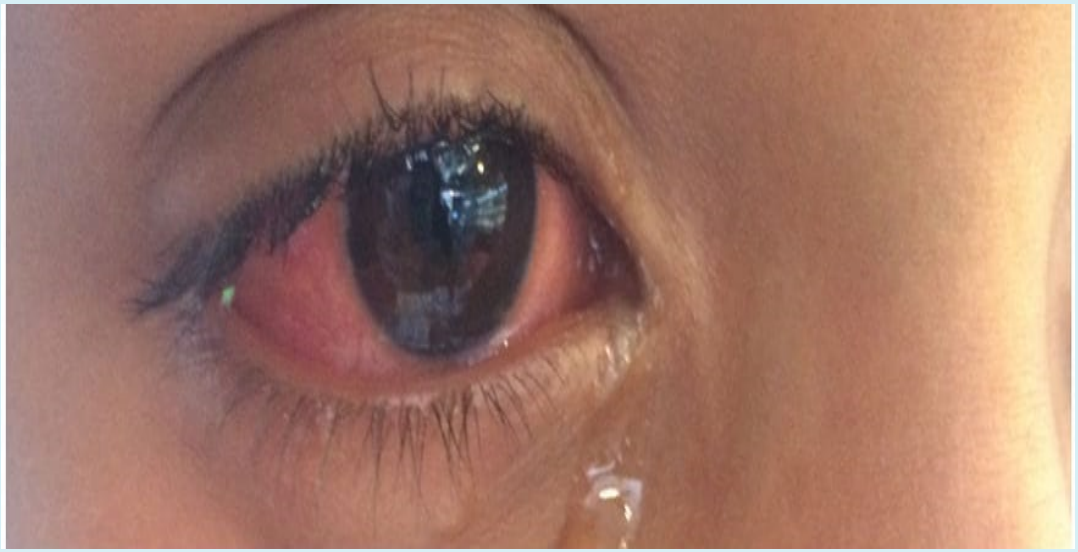
ADENOVIRUSES

- Incubation period is 2-14 days.
- Clinical syndromes:
- Eye: Epidemic keratoconjunctivitis, acute follicular conjunctivitis, pharyngoconjunctival fever.
- Respiratory : system Common cold (rhinitis), pharyngitis, tonsillitis, bronchitis, pneumonia.
- Genitourinary: Acute hemorrhagic cystitis, orchitis, nephritis.
- Gastrointestinal Gastroenteritis, mesenteric adenitis, appendicitis.
- Rare results of adenovirus infections: Meningitis, encephalitis, arthritis, myocarditis, hepatitis.
- Fatal disease may occur in immunocompromised patients, as a result of a new infection or reactivation of latent virus

↓ Causes school outbreaks

↓ Present with Hematuria

Adenoviral tonsillitis



Keratoconjunctivitis = intense redness of the conjunctiva

MCQ

An 8-year-old sickle-cell patient seen at the emergency room (ER) for fever. Over the previous several days, the child has become progressively tired and pale. The hemoglobin concentration in the ER is 3.1 mg/dL.

Which of the following viruses commonly causes such

a clinical picture?

a. Roseola

b. Parvovirus B19

c. Coxsackie A16

d. Echovirus 11

e. Cytomegalovirus

Ans : B

case

- a six month old male, had the acute onset of fever to 39^{o} c and irritability.
- He was seen in your office and examination of the tympanic membranes revealed the physical findings noted.

Diagnosis : acute otitis media
Rx : conservative + antibiotic

Risk factors for OM

- Children cared for in group settings
- Children who live with adults who smoke
- Infants who nurse from a bottle while lying down
- Children who are not breast-fed

- **Strep. Pneumoniae** Non typapyl Cuz types as B are covered by vaccine
- **H. influenzae**
- **M. catarrhalis**
- **Strep. pyogenes**
- **Staph. Aureus**
- **No growth** Either due to antibiotic treatment was initiated or other viral cause

OM treatment

Amoxicillin

Complications of OM

- chronic effusion, hearing loss Due to fluid accumulation
- Mastoiditis

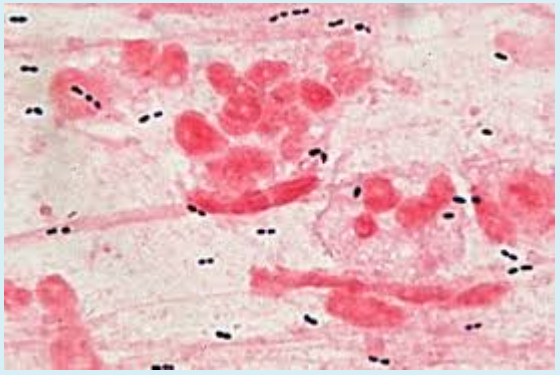
If chronic :

- intracranial extension (brain abscess, subdural empyema, or venous thrombosis).
- cholesteatoma (mass-like keratinized epithelial growth)

Pneumococcal infections

Most common cause

- Often carried in nasopharynx of healthy children
- transmission is by respiratory droplets.
- the incidence of invasive disease has declined. Due to vaccine
- Susceptibility is increased in hyposplenism (e.g. SCD, nephrotic syndrome, spleenectomy)
- May cause pharyngitis, otitis media, conjunctivitis, sinusitis, invasive disease (pneumonia, bacterial sepsis and meningitis).
- Prevention: Vaccine (PCV13, PPV23)
- Prophylaxis for high risk.



Impetigo = honey like crustation

Impetigo

- Impetigo is a bacterial skin infection
- Staphylococcus aureus / streptococcus pyogenes.
- honey-coloured crusted lesions
- Lesions are usually on the face, neck and hands
- most common in infants and young children.
- It is contagious. By direct contact
- Topical antibiotics (e.g. mupirocin) In mild cases; cover staph, MRSA, +ve strep
- Systemic: cloxa, augmentin, cephalexin.

↑ 1st generation of cephalosporin

Cellulitis of the lower limb

Place of organism entry

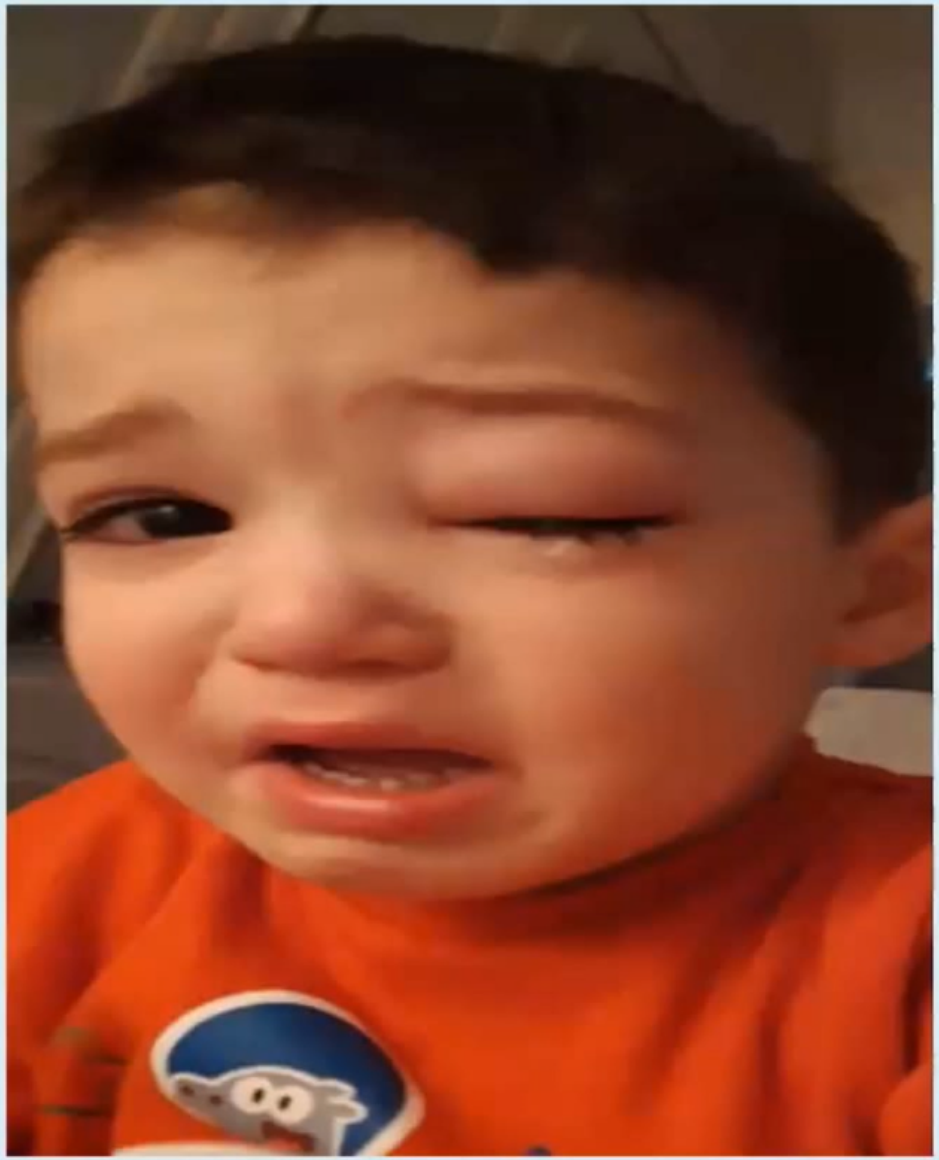
Cellulitis with pustule

Cellulitis

- Inflammation of the subcutaneous connective tissue – may lead to abscess
- Streptococcus pyogenes, Staphylococcus aureus, Haemophilus influenzae (<2 yrs)
- Therapy: clindamycin, cefazolin, cloxacillin

Include MRSA

↑
1st choice ; if you are thinking of staph, MRSA



Periorbital cellulitis

Periorbital cellulitis

- fever with erythema, tenderness, oedema of the eyelid.
- It is almost always unilateral.
- In young, unimmunised children it may also be caused by *Haemophilus influenza* type b which may also be accompanied by infection at other sites, e.g. meningitis. Unimmunized → always test for meningitis
- It may follow local trauma to the skin. In older children, it may spread from a paranasal sinus infection or dental abscess
- Treatment : i.v antibiotic + exclusion of orbital involvement

Sub-conjunctiva hemorrhage

Child who is coughing

Pertusis (Whooping Cough)

- Bordetella Pertusis
- Incubation Period: 7 – 14 days
- Coughing adults are major reservoirs →. Cuz adult immunity will go down due to no booster vaccine so they will carry it , but not get effected by it → unimmunized children will get affected
- Clinical Features:The infection usually lasts 6 wks
  - Cold symptoms (~2 weeks) Initial sx
  - Progressively worse cough (~4 weeks)
  - Complete resolution (may take months)

- Treatment: erythromycin (other macrolids)
- Isolation & Infectivity:
  - up to 6 weeks
  - but with treatment => 5 days after starting therapy
- Vaccine, doesn't provide lifelong immunity Booster dose are needed in adult

Video
https://www.youtube.com/watch?v=TIV460AQUWk

Complication

- OM
- Pneumonia
- apnea
- Convulsions
- Brain damage from lack of oxygen
- cerebral hemorrhage

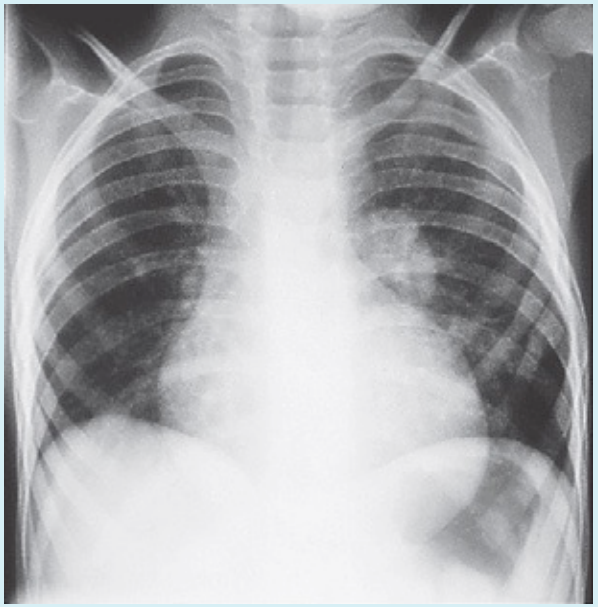
Due to repeated coughing

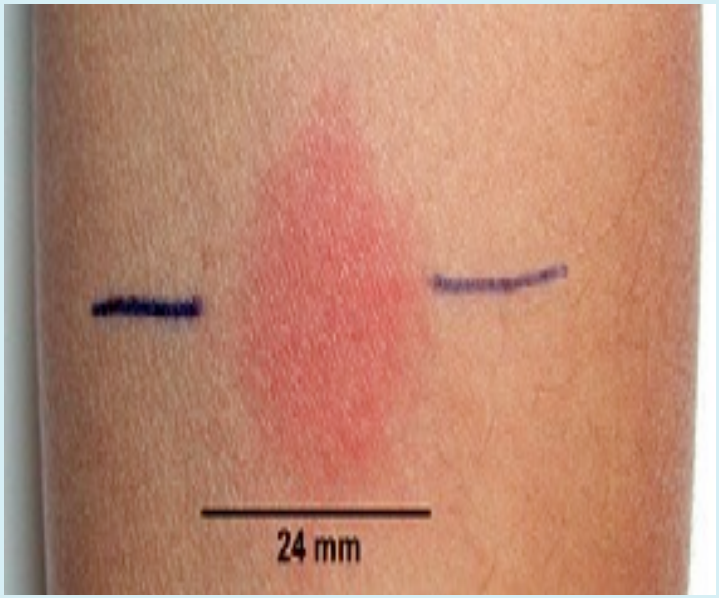
MCQ

- Which of the following is responsible for causing Hand-Foot-and-Mouth Disease?

a. Adenovirus
b. Coxsackievirus
c. Cytomegalovirus
d. Echovirus 22
e. Epstein-Barr Virus

Ans : B





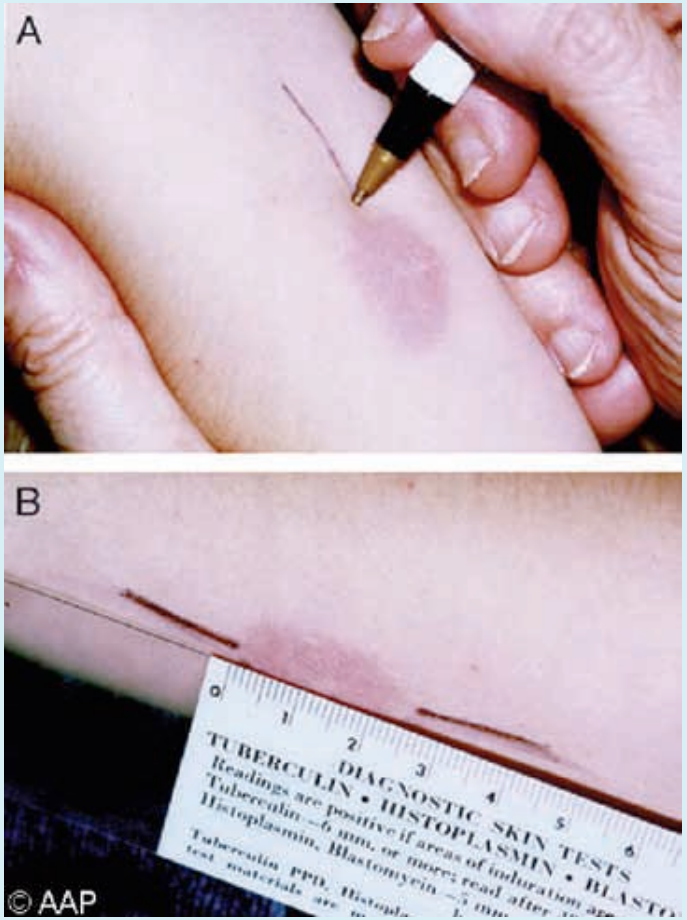
Mantoux skin test / tuberculin skin test

Tuberculosis

- TB affects millions of children worldwide; low but increasing incidence in many developed countries.
- Diagnosis of TB in children is even more difficult than in adults. The clinical features of the disease are nonspecific, such as prolonged fever, malaise, anorexia, weight loss or focal signs of infection. Lymph node enlargement or bone infection
- Clinical features follow a sequence – primary infection, then dormancy, which may be followed by reactivation to post-primary TB.
- TB disease can present as local disease or may be widely disseminated, miliary TB to sites such as bones, joints, kidneys, pericardium and CNS.
- In infants and young children, seeding of the CNS is particularly likely, causing tuberculous meningitis

- Diagnosis is often difficult, so decision to treat is usually based on contact history, Mantoux test, interferon-gamma release assays (Quantiferon), chest X-ray and clinical features.
- Young children swallow their sputum, so early morning gastric aspirate are required (3 samples)
- Contact tracing is important. To control the spread
- TB is more difficult to diagnose and more likely to disseminate in the immunosuppressed.

In adult we do sputum culture but children swallow sputum even at night all the time so we take their sputum through NGT at morning before he eats anything



We don’t measure the redness , we measure the induration (elevation)

Go from 2 opposite sites get your pen until your reach the elevation not the redness

Table 124-3 Recommended Treatment Regimens for Drug-Susceptible Tuberculosis in Infants, Children, and Adolescents

INFECTION OR DISEASE CATEGORY	REGIMEN	COMMENTS
LATENT TUBERCULOSIS INFECTION (POSITIVE TST RESULT, NO DISEASE)		
Isoniazid-susceptible	9 months of isoniazid, once a day	If daily therapy is not possible, DOT twice a week can be used for 9 months.
Isoniazid-resistant	6 months of rifampin, once a day	
Isoniazid-rifampin–resistant	Consult a tuberculosis specialist.	
Pulmonary and extrapulmonary (except meningitis)	2 months of isoniazid, rifampin, and pyrazinamide daily, followed by 4 months of isoniazid and rifampin twice weekly under DOT	If possible drug resistance is a concern, another drug (ethambutol or an aminoglycoside) is added to the initial three-drug therapy until drug susceptibilities are determined. DOT is highly desirable.
		If hilar lymphadenopathy only, a 6-month course of isoniazid and rifampin is sufficient.
		Drugs can be given 2 or 3 times per week under DOT in the initial phase if nonadherence is likely.
Meningitis	2 months of isoniazid, rifampin, pyrazinamide, and an aminoglycoside or ethionamide, once a day, followed by 7–10 months of isoniazid and	A fourth drug, usually an aminoglycoside, is given with initial therapy until drug susceptibility is known.
	rifampin, once a day or twice a week (9–12 months total)	For patients who may have acquired tuberculosis in geographic areas where resistance to streptomycin is common, capreomycin, kanamycin, or amikacin may be used instead of streptomycin.

Doctor only read this box