Fever and Rash

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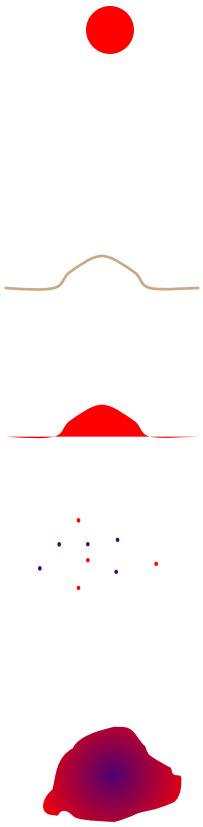
Definitions

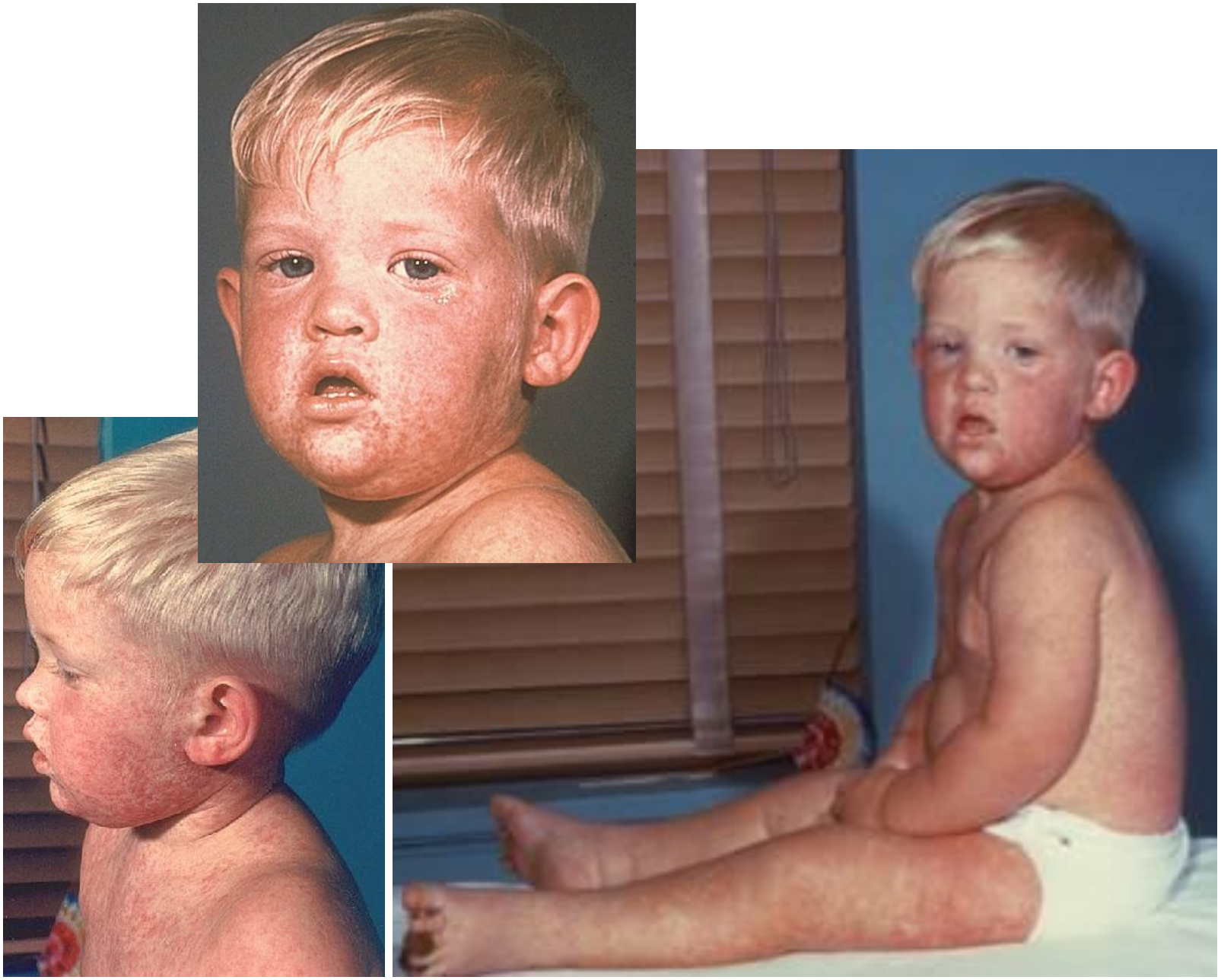
- Macule: discolored spot (often, but not necessarily red; often, but not necessarily round); blanches
- Papule: raised spot
- Maculopapular: a papule rising from a macule, often red
- Petechia: pinpoint purple/red bruise; does NOT blanch, often in clusters
- Ecchymosis: red/purple bruise, variable size & shape



Case #1

3-year-old male with:

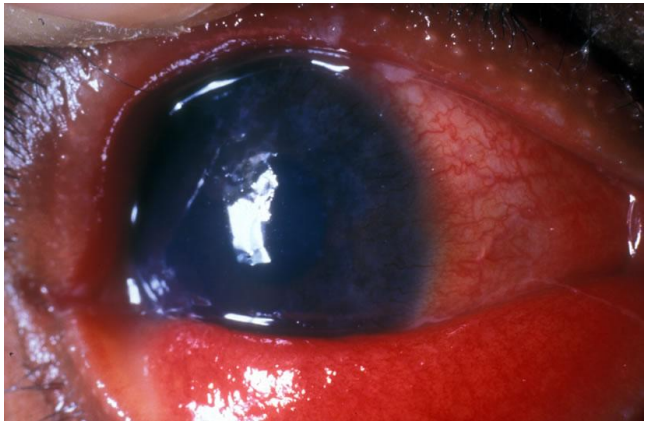
- fever x several days
- total body rash (red maculopapular) began 2 days after fever
- cough, runny nose, & red eyes
- irritability

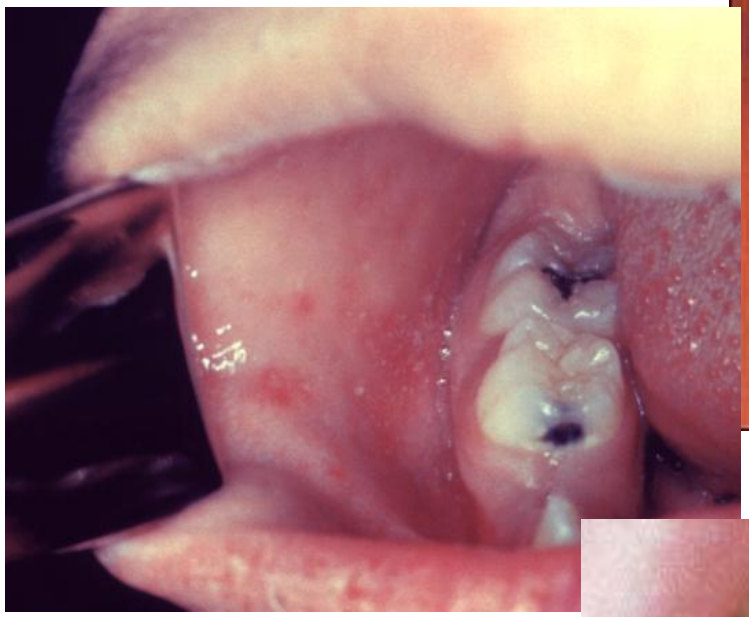


Maculopapular rash

Measles

- “Stepwise” high fever
- Cough, coryza, and conjunctivitis
- Rash (exanthem) starts on head & spreads to rest of body
- Koplick spots (enanthem) prior to or at very beginning of rash
- Complications: OM, diarrhea, encephalitis, pneumonia



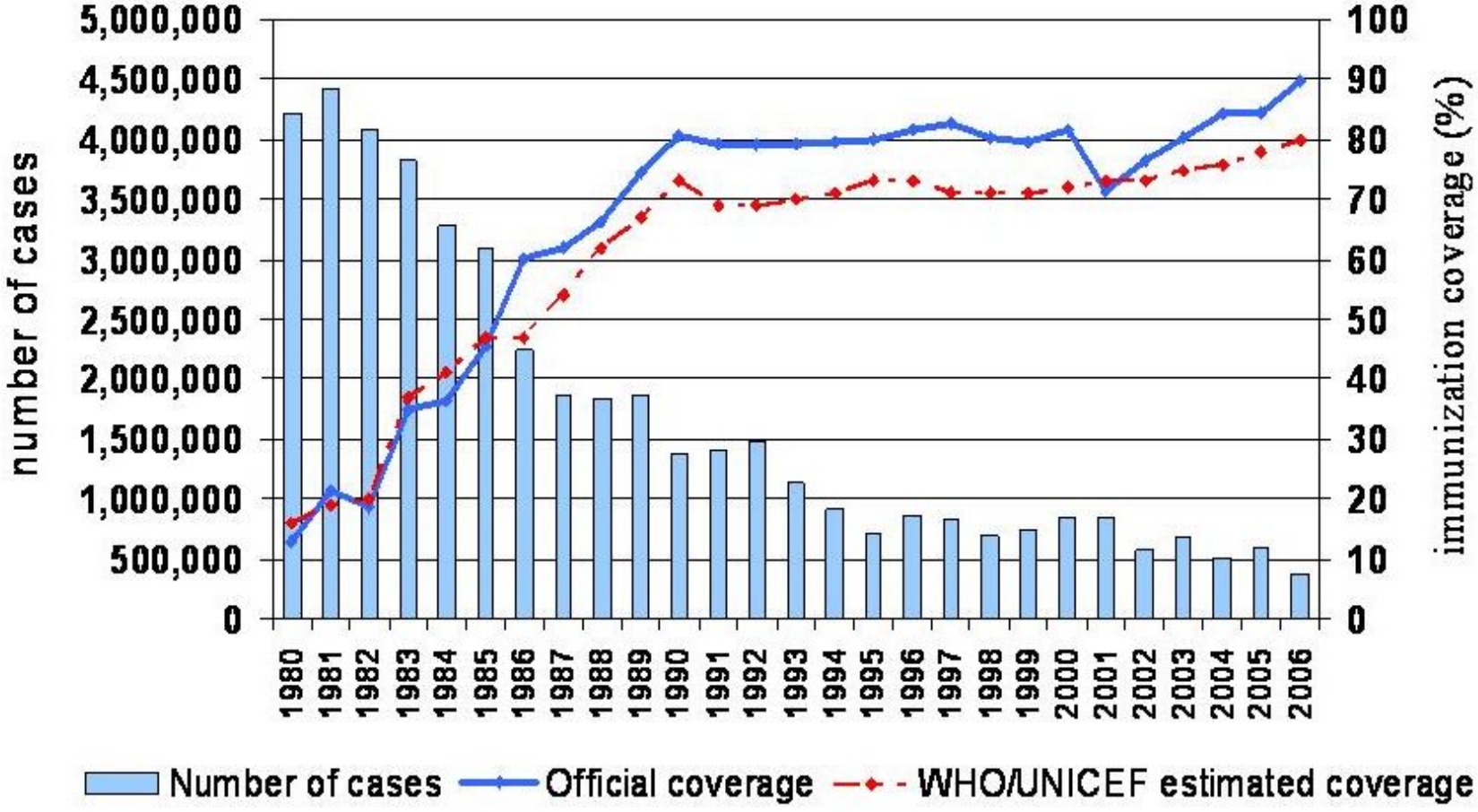


Koplick Spots

Measles (Rubeola)

- Highly contagious
- Most deadly of all childhood rash/fever illnesses
- Spread by droplets or direct contact with nasal or throat secretions of infected persons
- Incubation period: 8 -12 days
- Prevention: immunization (MMR) just past one year & before kindergarden

Measles global annual reported incidence and MCV coverage, 1980-2006



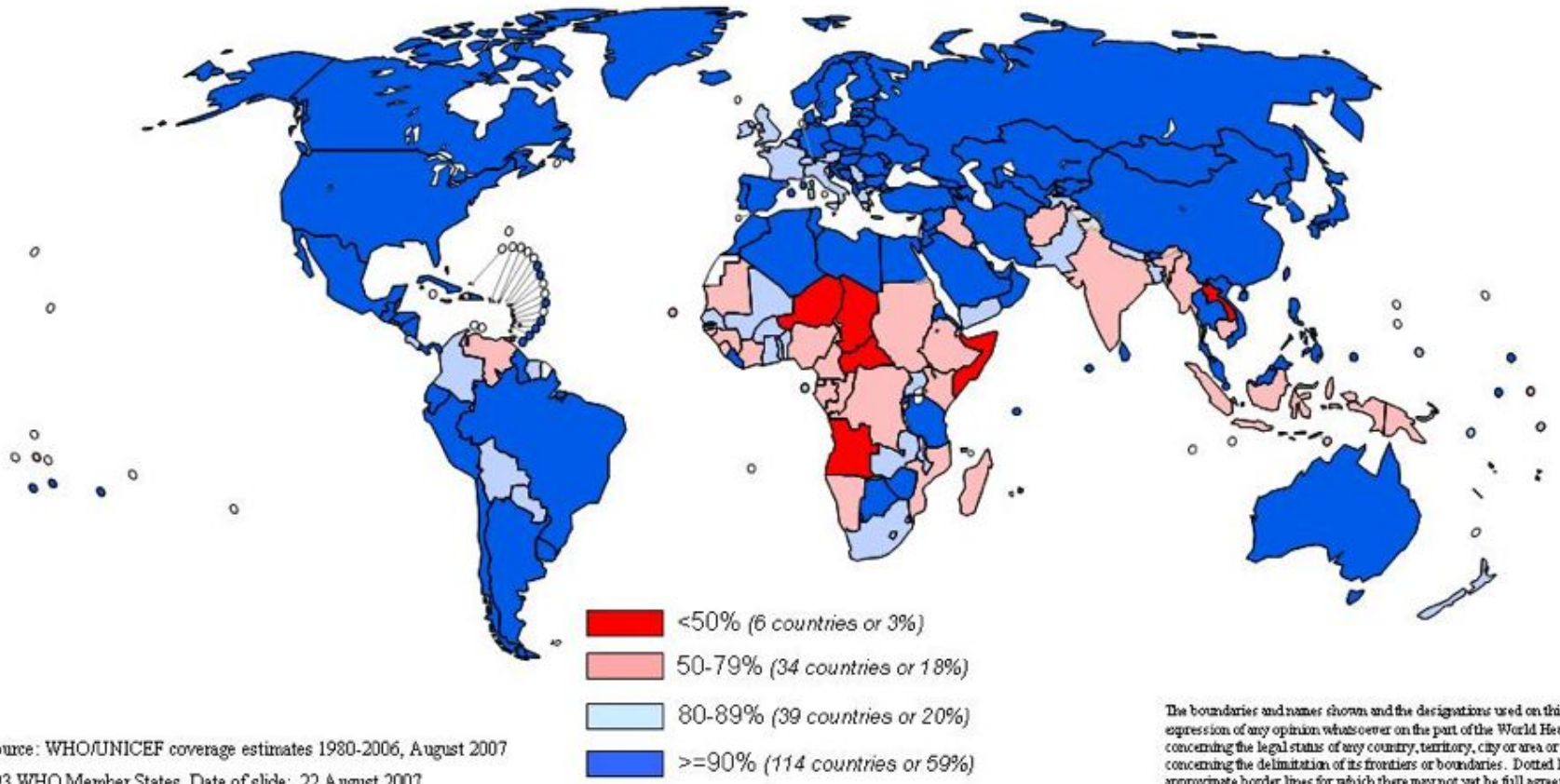
Source: WHO/IVB database, 2007

193 WHO Member States. Data as of September 2007

Date of slide: 10 September 2007

WHO

Immunization coverage with measles containing vaccines in infants, 2006



Source: WHO/UNICEF coverage estimates 1980-2006, August 2007
193 WHO Member States. Date of slide: 22 August 2007

World Health Organization

Case #2

13-year-old male with:

- fever x two days
- generalized rash

On PE:

- Well & comfortable
- Maculopapular rash
- Postauricular lymphadenopathy

Rubella (German Measles)

- Low grade fever
- Rash:
  - starts on face & spreads down body, clearing in same pattern
  - Light red spots, fainter than measles
  - Lasts 1 - 3 days
- Mild illness, may be missed
- Adults & adolescents may have arthritis or arthralgia
- Complications: encephalitis, neuritis & in pregnancy Congenital Rubella Syndrome in baby

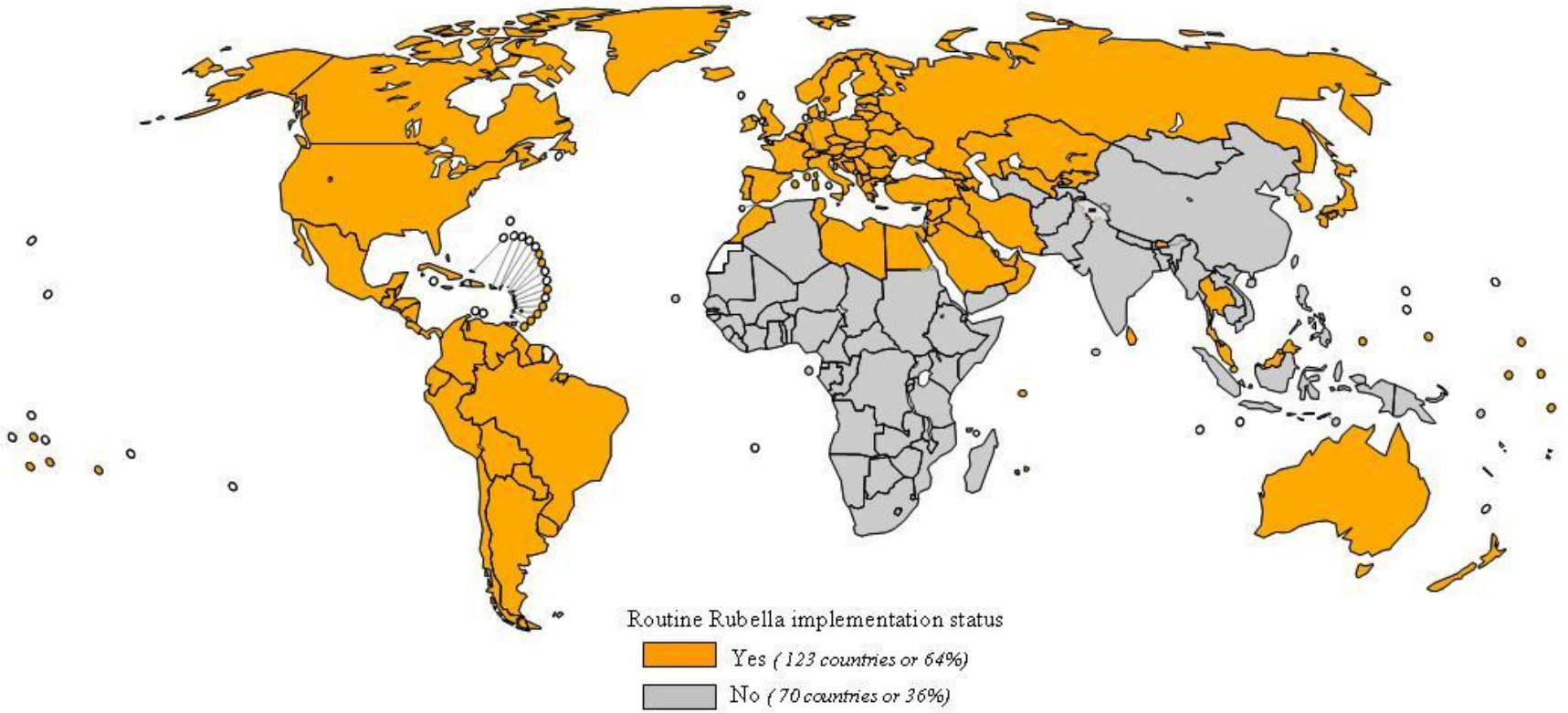
Congenital Rubella

- Rash
- Cataracts
- CHD (PDA)
- Blindness
- Neurosensory deafness
- Microcephaly & mental retardation

Rubella

- Droplet transmission
- Incubation period: 2 - 3 weeks
- Prevention: Vaccination (MMR)

Countries Using Rubella Vaccine in National Immunization Schedule, 2006



Source: WHO/IVB database, 193 WHO Member States. Data as of August 2007

Date of slide: 08 August 2007

Case #3

- 15-month-old presents with several days of fever, & rash that looks like this:

Fifth Disease, Erythema Infectiosum

- Parvovirus B19
- Fever, malaise & headache may precede rash by up to 10 days
- “Slapped cheeks” and “lacy, reticular” rash over body that may itch
- No longer infectious once rash develops
- Virus may also cause polyarthropathy syndrome, aplastic crisis, or hydrops fetalis

Hydrops Fetalis

Case #4

- 8-month-old female with fever to 40°C for past 5 days
- Baby does not look unwell
- PE reveals no source of fever
- U/A negative
- WBC mildly elevated; mostly lymphocytes
- D/C on acetaminophen
- Next day mother calls to say baby has a rash

Roseola (Sixth disease, Exanthem subitum)

- Peak incidence 6-24 months
- 20% of HHV-6 infections
- Also HHV-7
- Self-limited disease:
  - 3-7 days of fever
  - Rash follows defervescence
- Febrile seizures in 10-15%
- Occasionally, bulging fontanelle & encephalopathy

Case #5

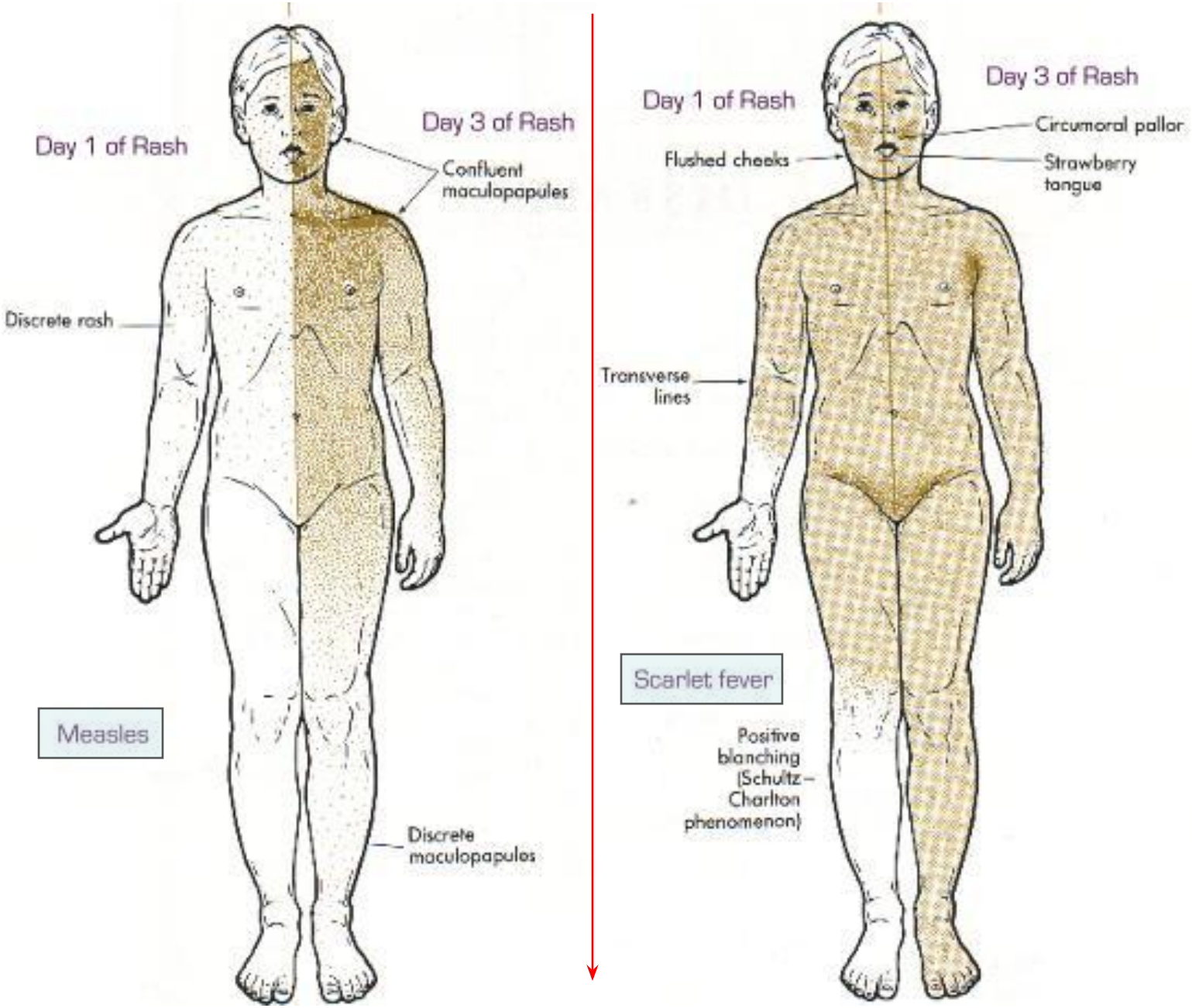
- 3-year-old boy with fever & irritability x 6 days.
- PE:
  - maculopapular rash
  - red eyes
  - strawberry tongue
  - cervical lymphadenopathy

Scarlet Fever

- Group A β Strep
- Generalized rash:
  - Sandpapery
  - Circumoral pallor
  - Pastia's lines

Pastia’s lines

Circumoral pallor


Day 1 of Rash
Day 3 of Rash
Confluent maculopapules
Discrete rash
Measles
Discrete maculopapules
Day 1 of Rash
Day 3 of Rash
Circumoral pallor
Flushed cheeks
Strawberry tongue
Transverse lines
Scarlet fever
Positive blanching (Schultz–Charlton phenomenon)

Kawasaki Syndrome
Mucocutaneous Lymph Node Syndrome

3 phases:

- Acute: 1-2 wks, fever, etc
- Subacute: ≈ 2-4 wks
  - After acute signs □
- Convalescent: ≈ 6-8 wks
  - about 4th wk; when clinical signs disappear
  - Until ESR returns to normal

Kawasaki Syndrome
Mucocutaneous Lymph Node Syndrome

Acute Phase:

- Fever for at least 5 days (usually 1-2 wks, may last 3-4 wks) plus 4/5 of following criteria:
- Rash (maculopapular, erythema multiforme or scarlatiniform; □ in groin area)
- Lymphadenopathy (non suppurative, ≥1.5cm, usually unilateral)
- Bulbar conjunctival injection
- Mucosal changes (mouth & pharynx redness; perineal dequamation)
- Extremity changes (hands & feet erythema & swelling)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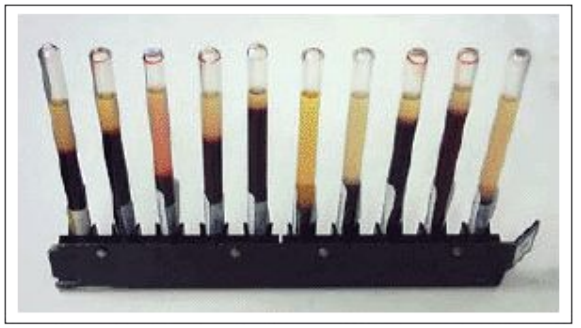
Kawasaki Syndrome: Subacute phase

- Irritability, anorexia & conjunctival injection may persist
- Periungual desquamation of fingers & toes
- Thrombocytosis
- Coronary aneurysms (greater risk with prolonged fever)
- Greater risk of sudden death

Kawasaki Syndrome: Associated findings:

- □ acute phase reactants (APRs)
- Thrombocytosis
- Sterile pyuria
- Elevated LFTs
- Hydrops of gallbladder
- Aseptic meningitis



Stacks of tubes showing variation in ESR

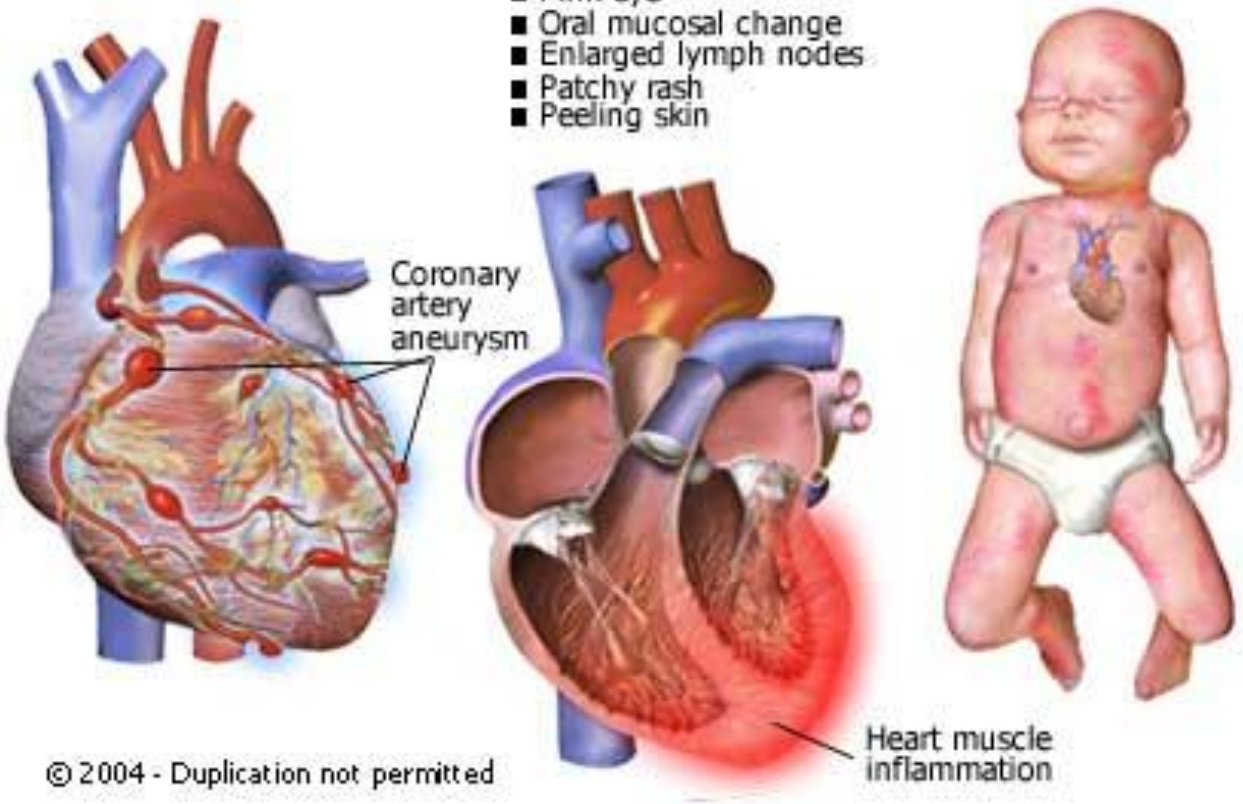
Kawasaki Syndrome: Coronary aneurysm

- 20 - 25% of patients not treated within 10 days
- High risk: male, Asian, < 1 year, >8 years, anemia, persistent fever after treatment
- 1- 4 weeks after onset of illness, uncommon after 6 weeks
- Case fatality rate < 0.01%, primarily from myocardial infarction

Kawasaki Disease

A type of disease that primarily affects young children and believed to be caused by a non-contagious infection. Symptoms include:

- Pink eye
- Oral mucosal change
- Enlarged lymph nodes
- Patchy rash
- Peeling skin



Kawasaki Syndrome: Treatment

- Intravenous Immune Globulin 2g/kg x1
- Aspirin:
  - 80-100 mg/kg/day until fever x 14 day, then
  - 3-5mg/kg/day x ≥ 6-8 weeks
- Warfarin for hi risk patients
- Follow echocardiograms
- Need to re-treat in 5-10%

Case #6

- A 10-year-old male presents in September, with fever & rash
- Questions?
- Tick-borne diseases in NY?

Lyme disease in

- US: southern New England & eastern Middle Atlantic states, less on Pacific coast
- Europe: Scandinavia, Germany, Austria, Switzerland
- 20-100 cases/100,000 pop'n in endemic areas

Erythema chronicum migrans

Lyme Disease

- *Borrelia burgdorferi transmitted by:*
- *Ixodes* tick
  - Ehrlichia, babesia

Lyme Disease: early localized

- Erythema migrans:
  - About 1-2 weeks after tick bite, at site of bite; usually axilla, periumbilical, groin & thigh
  - May be itchy or painful
  - May be associated with fever, myalgia, h/a or malaise
  - Without treatment, expands to ≈ 15cm x ≥ 1-2 wks

Lyme Disease: early disseminated

- 20% develop smaller secondary lesions due to hematogenous spread; continue to appear x several wks
- Fever, myalgia, h/a or malaise
- Conjunctivitis
- Lymphadenopathy
- Aseptic meningitis
- +++

Lyme Disease: late disseminated

- Arthritis after wks to mos
  - Large joints, especially knees (90%)
  - Swollen, tender, but not too pianful
  - Usually resolves within 1-2 wks

Lyme Disease

- Screen with EIA (enzyme immunoassay), ***always*** confirm with Western blot
- Treat with oral doxycycline/amoxicillin x 14 days

- Prevention:
  - wear protective clothing
  - Check for & remove tics after exposure

Case #7

- 14-year-old male presents with one week history of fever & throat pain
- Seen by PMD yesterday & prescribed amoxicillin for presumed streptococcal pharyngitis (throat culture pending)
- Referred for evaluation of possible amoxicillin allergy

Epstein Barr Virus

- Most common cause of mononucleosis syndrome:
- Transmitted in oral secretions by close contact, eg, kissing
- Shed in oral secretions up to 6 mos post infection
- Incubation period 30- 50 days in adolescents
- Silent infections in infants & young children

Infectious Mononucleosis

- Fever, fatigue, exudative pharyngitis, petechiae on palate, abdominal pain
- Hepatosplenomegaly, enlarged lymph nodes, atypical lymphocytosis

  - Diagnose with EBV-specific serology *or* atypical lymphocytes >10% & + Monospot
  - Supportive therapy, no contact sports until spleen ok

Case #8

- 4-year-old child with fever, sore throat & rash x 3 days
- PE significant for red, painful, sandpaper-y rash over body; perioral pallor & strawberry tongue

Scarlet Fever

- Group A Streptococcus (*S. pyogenes*)
- Erythrogenic toxin
- Accentuation of rash in creases = Pastia's lines
- -Rash desquamates after ~1 week
- Treat with penicillin to avoid suppurative /non-suppurative sequelae

Case #9

- 18-month-old girl presents with fever & rash for last 12 hours
- On initial PE, she is febrile & cranky, but otherwise appears stable
- While awaiting results of CBC in ER, rash progresses, & she becomes progressively obtunded

Neisseria meningococcemia

- Can present insidiously or in fulminant fashion
- High risk: asplenic, terminal complement deficiency (C5-C9), properdin deficiency
- Complications: purpura fulminans, Waterhouse Friedrichsen syndrome (hemorrhage into adrenals adrenal shock), DIC, death
- Treat with penicillin & supportive therapy
- Prophylax household or daycare contacts in 7 days prior to onset of disease

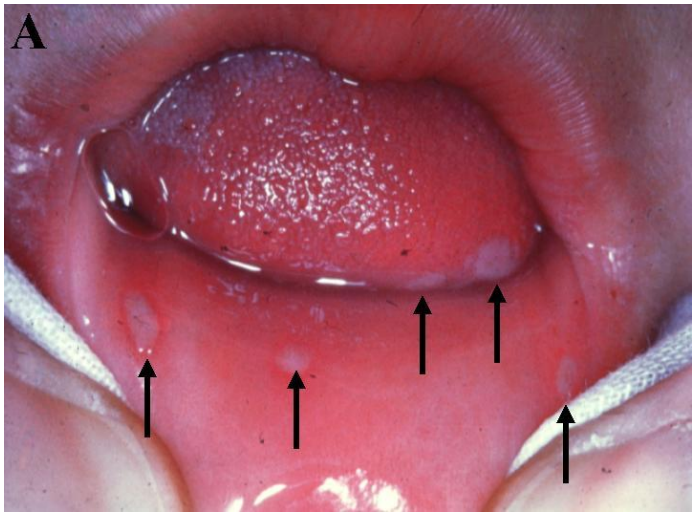
Case #10

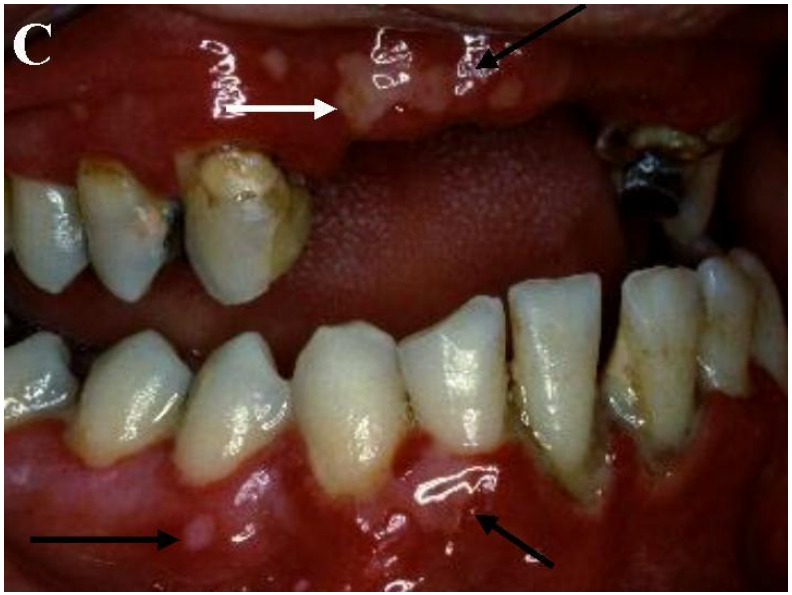
- 2-year-old male with rash to face & fever for three days. Rash worsening since onset.
- Has had this rash before.

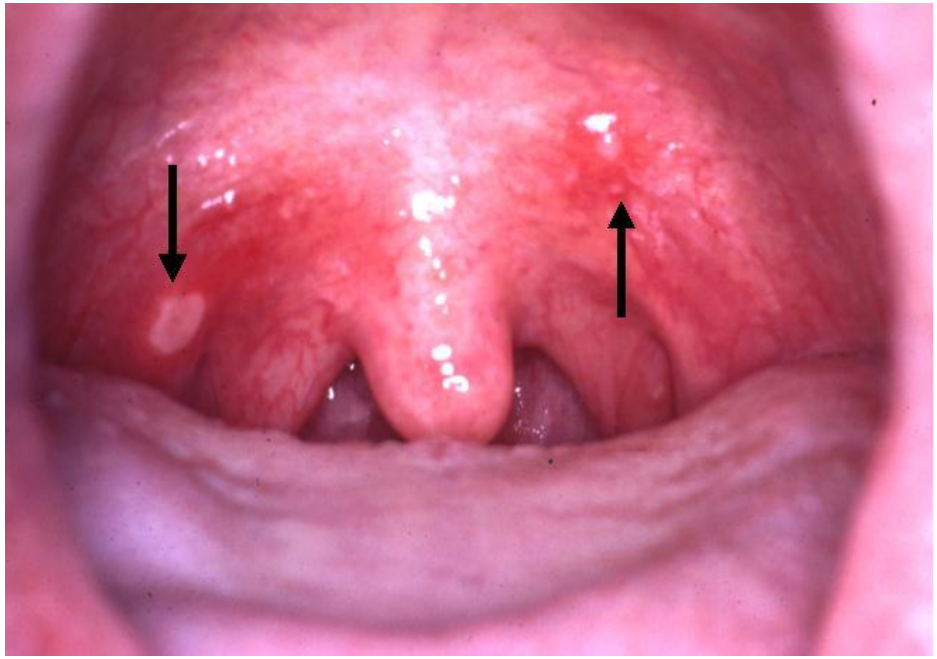
HSV Stomatitis

- Can affect any age groups
- Toddlers: drooling = spread of lesions, can also see whitlow
- Immunosuppressed at high risk
- Usually HSV-1
- Diagnose clinically, or by DFA/cx if diagnosis uncertain
- Treatment: supportive +/acyclovir

HSV Stomatitis







Whitlow

Case #11

- 3-year-old child presents in July with fever for 3 days, & refusal to eat or drink

Hand-Foot-and-Mouth Disease

- Coxsackie A16 & Enterovirus 71
- Oral lesions only: herpangina
- Vesicles on an erythematous base, at posterior pharynx/soft palate
- Commonly presents in spring & summer
- Supportive care

Case #12

- 2-year-old child presents with fever for four days & rash for two days.
- His father, who is visiting from Mexico to harvest strawberries, brought him to a walk-in clinic.

Varicella

- Herpes virus, vaccine preventable
- Incubation period: 14-16 days Prodrome: fever, constitutional symptoms, then rash starting on trunk & spreading to limbs (centrifugal)
- “Dewdrop on a rose petal”
- Vesicles in various states of evolution
- Contagious until all lesions crust over