

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

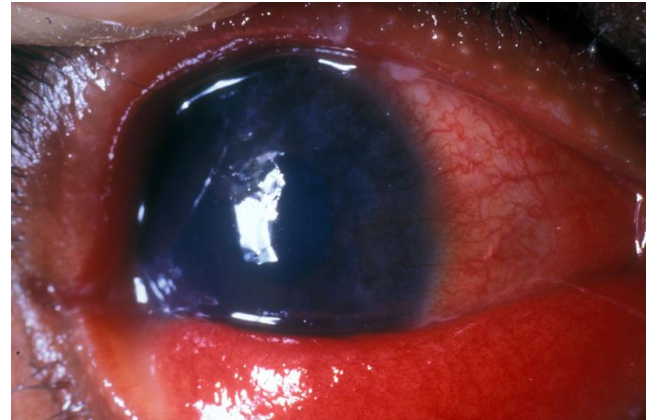


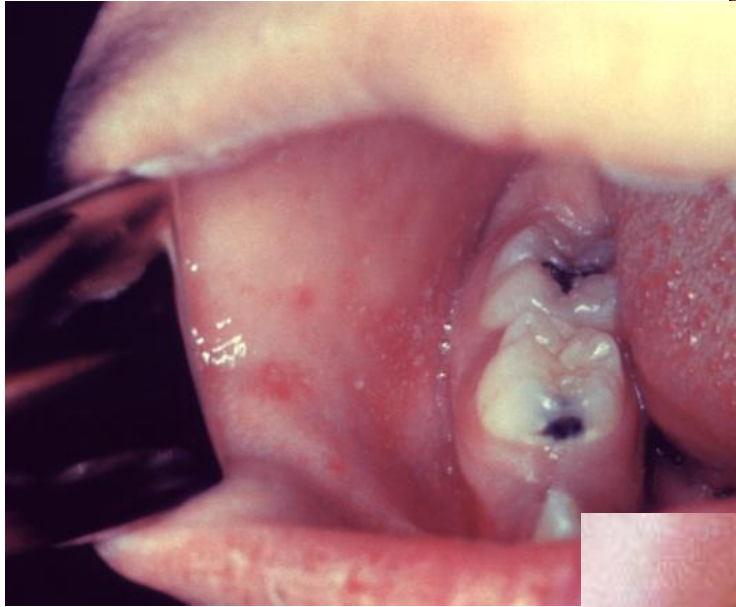
Maculopapular rash



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





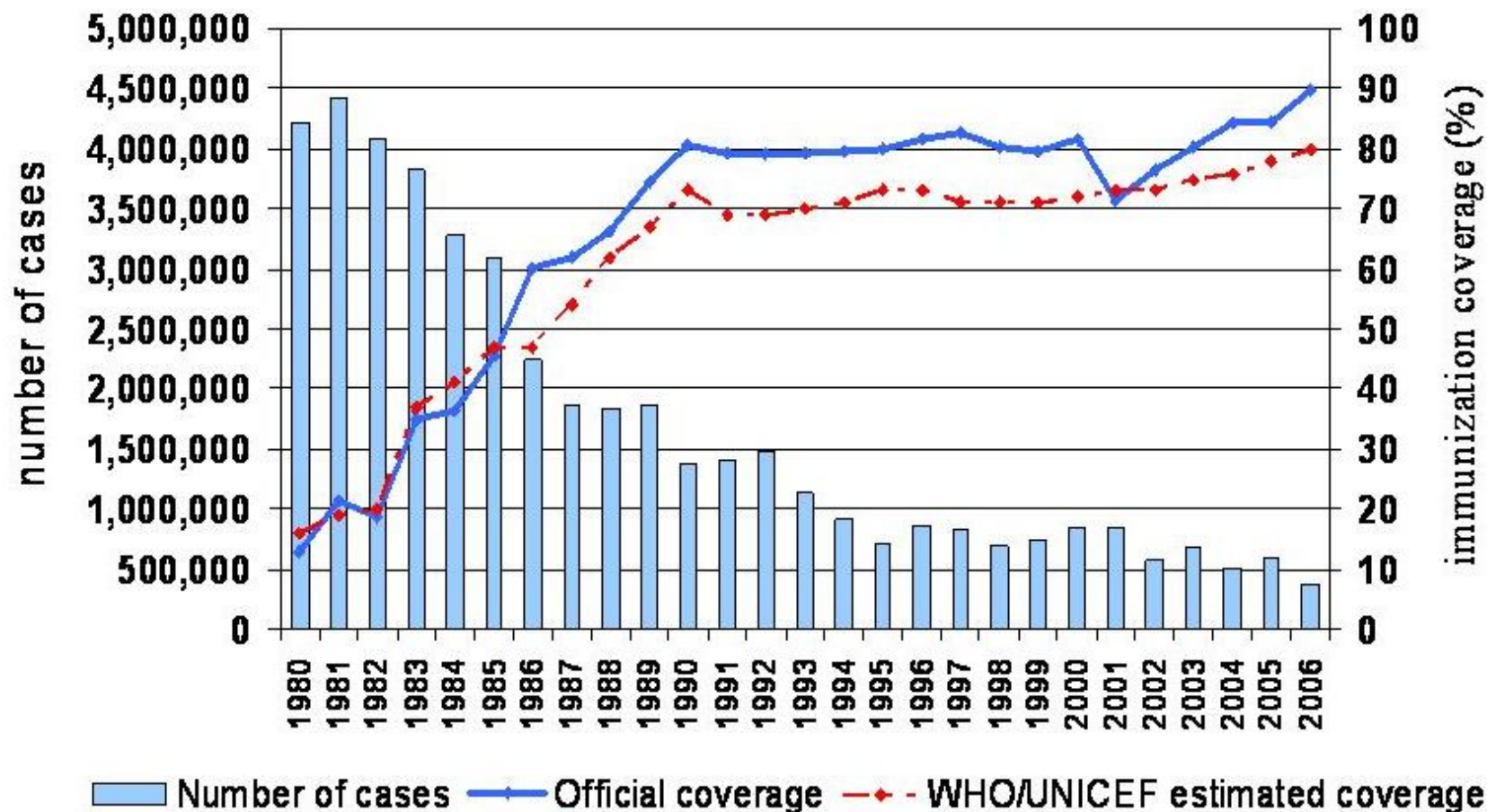
Koplick Spots



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



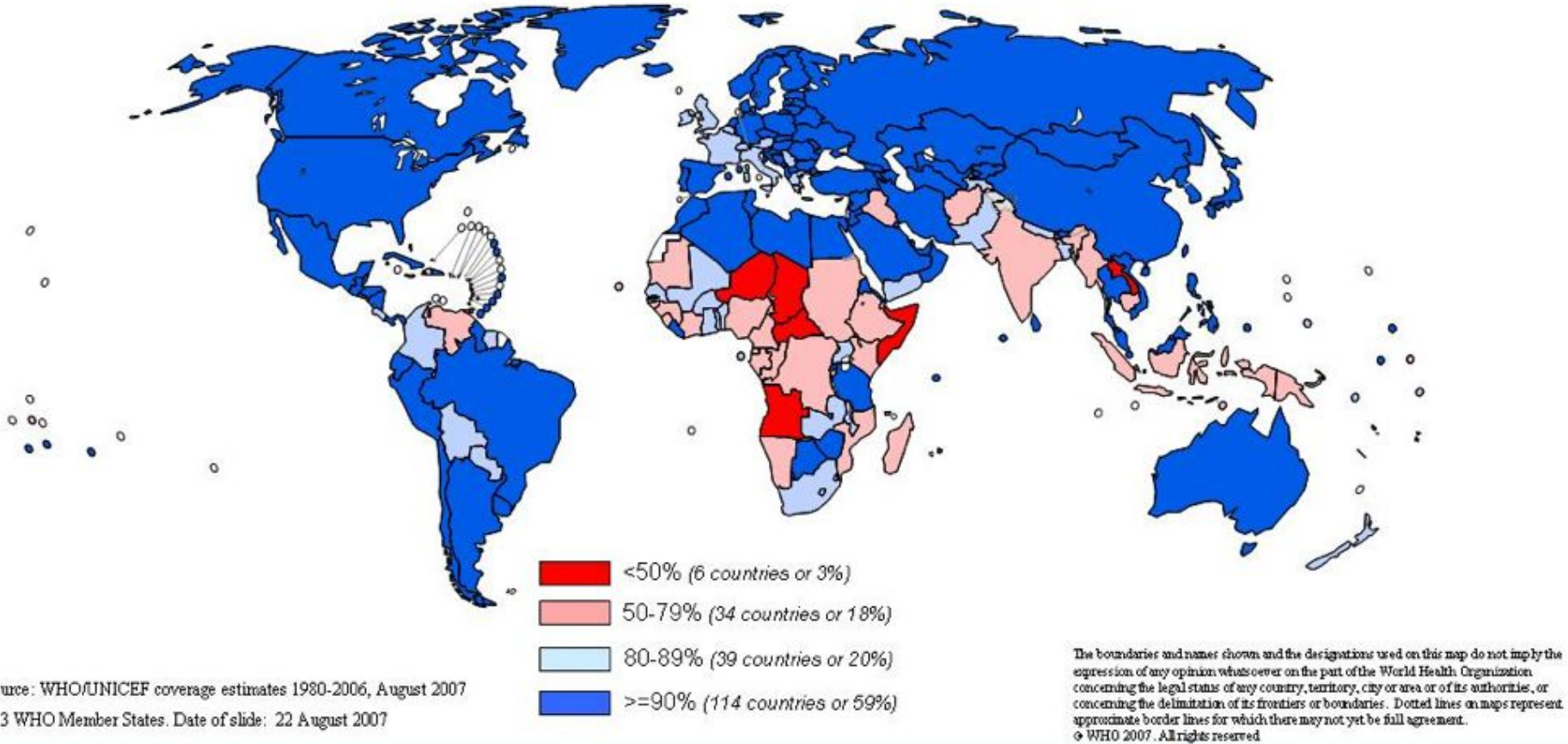
Source: WHO/IVB database, 2007

193 WHO Member States. Data as of September 2007

Date of slide: 10 September 2007



Immunization coverage with measles containing vaccines in infants, 2006



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

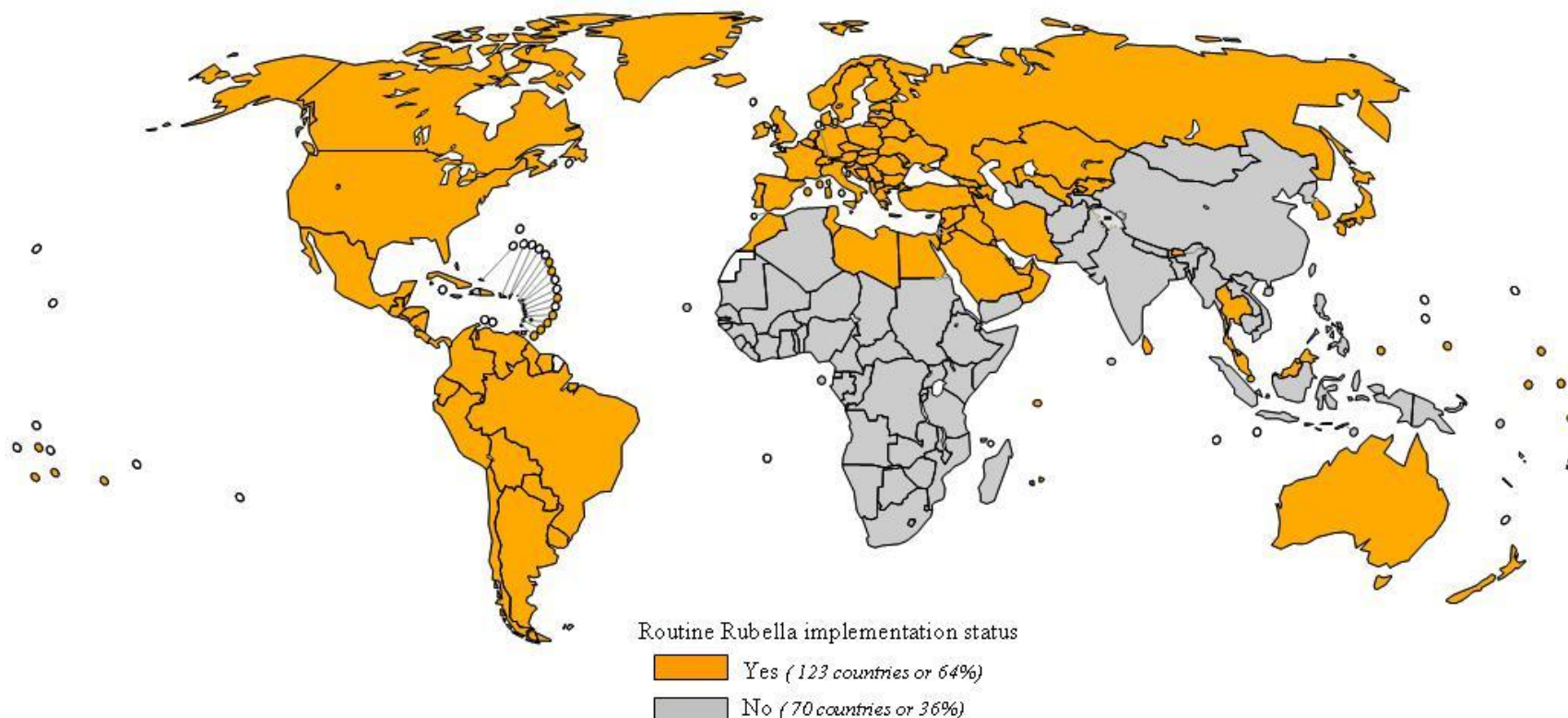
- Rash
- Cataracts
- CHD (PDA)
- Blindness
- Neurosensory deafness
- Microcephaly & mental retardation



Rubella

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

Countries Using Rubella Vaccine in National Immunization Schedule, 2006



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.
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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

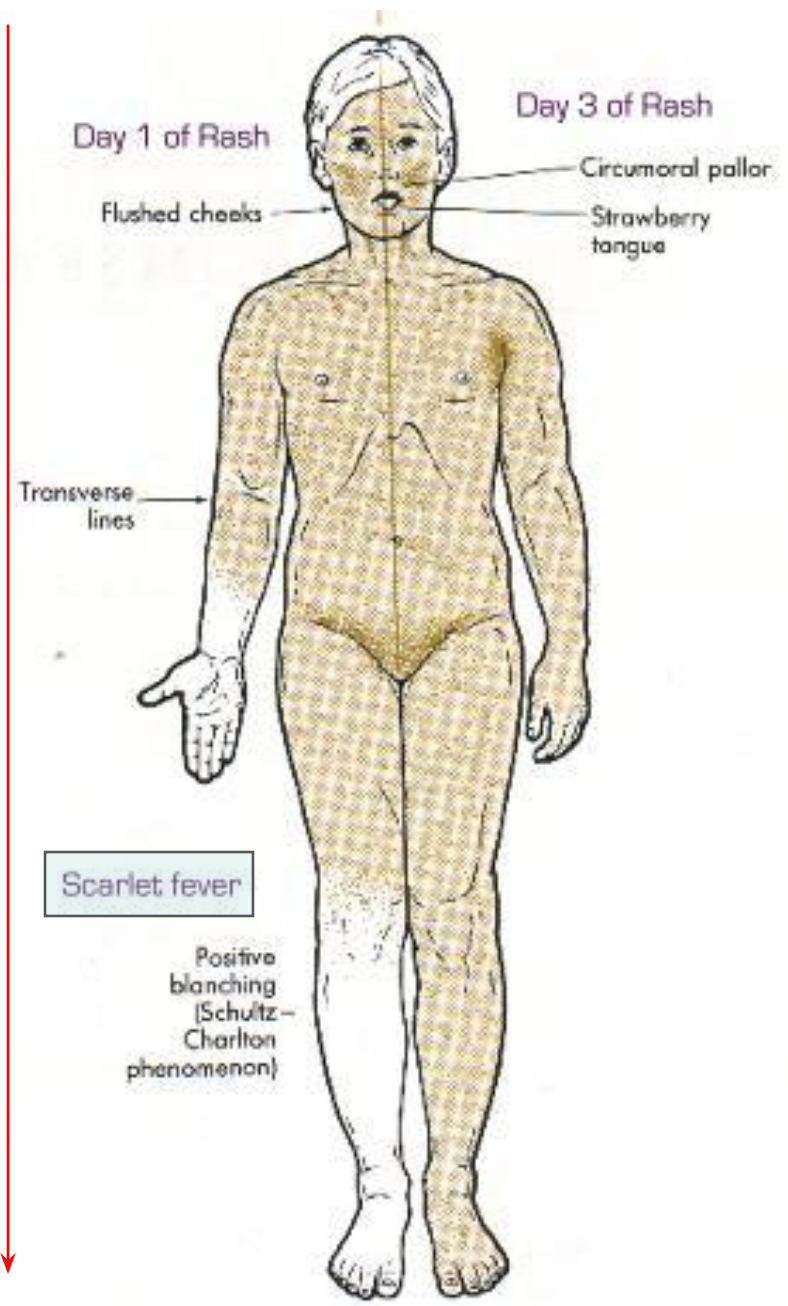
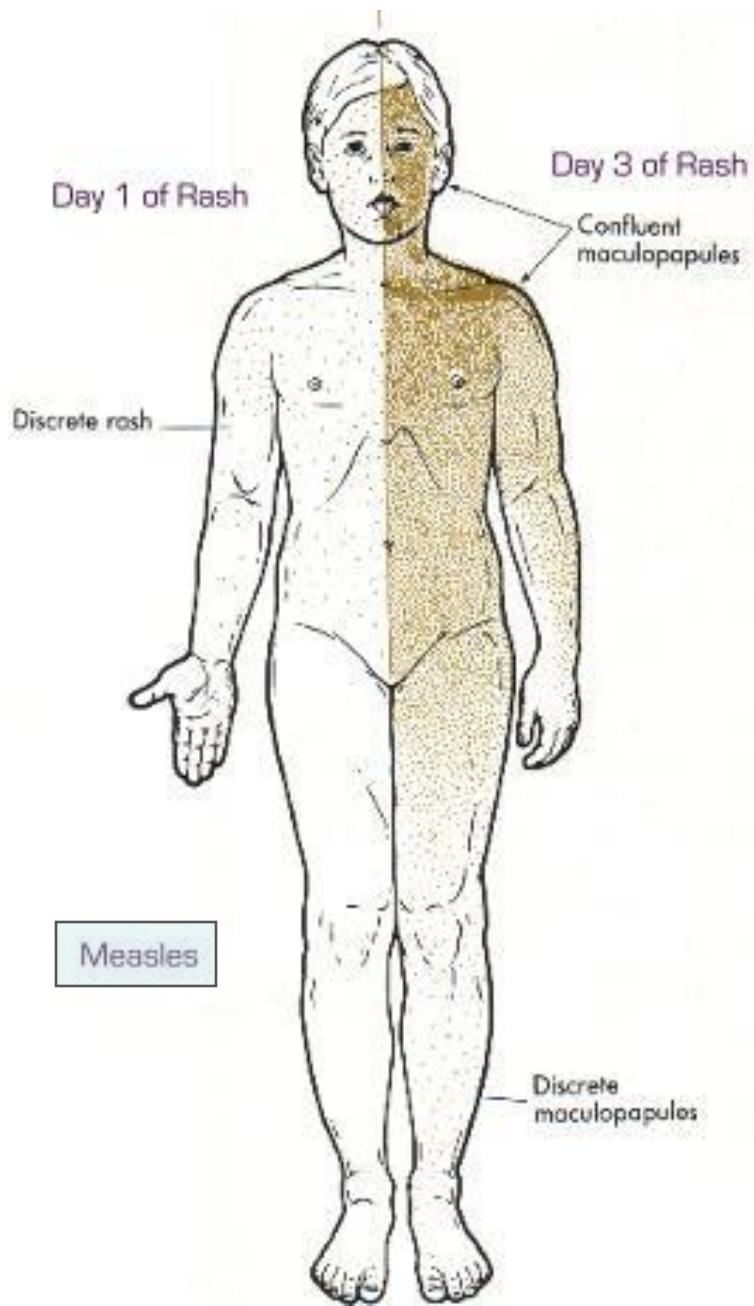
- Group A β Strep
- Generalized rash:
 - Sandpapery
 - Circumoral pallor
 - Pastia's lines



Pastia's lines

Circumoral pallor





Kawasaki Syndrome

Mucocutaneous Lymph Node Syndrome

3 phases:

- Acute: 1-2 wks, fever, etc
- Subacute: \approx 2-4 wks
 - After acute signs
- Convalescent: \approx 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)



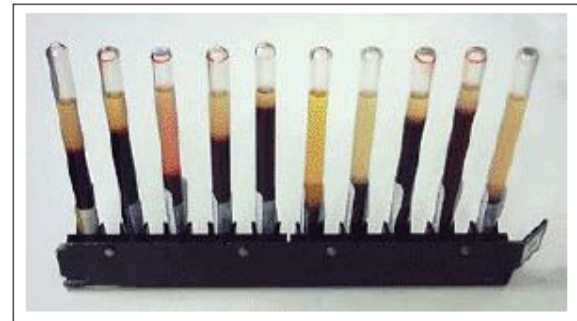
Kawasaki Syndrome: Subacute phase

- 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

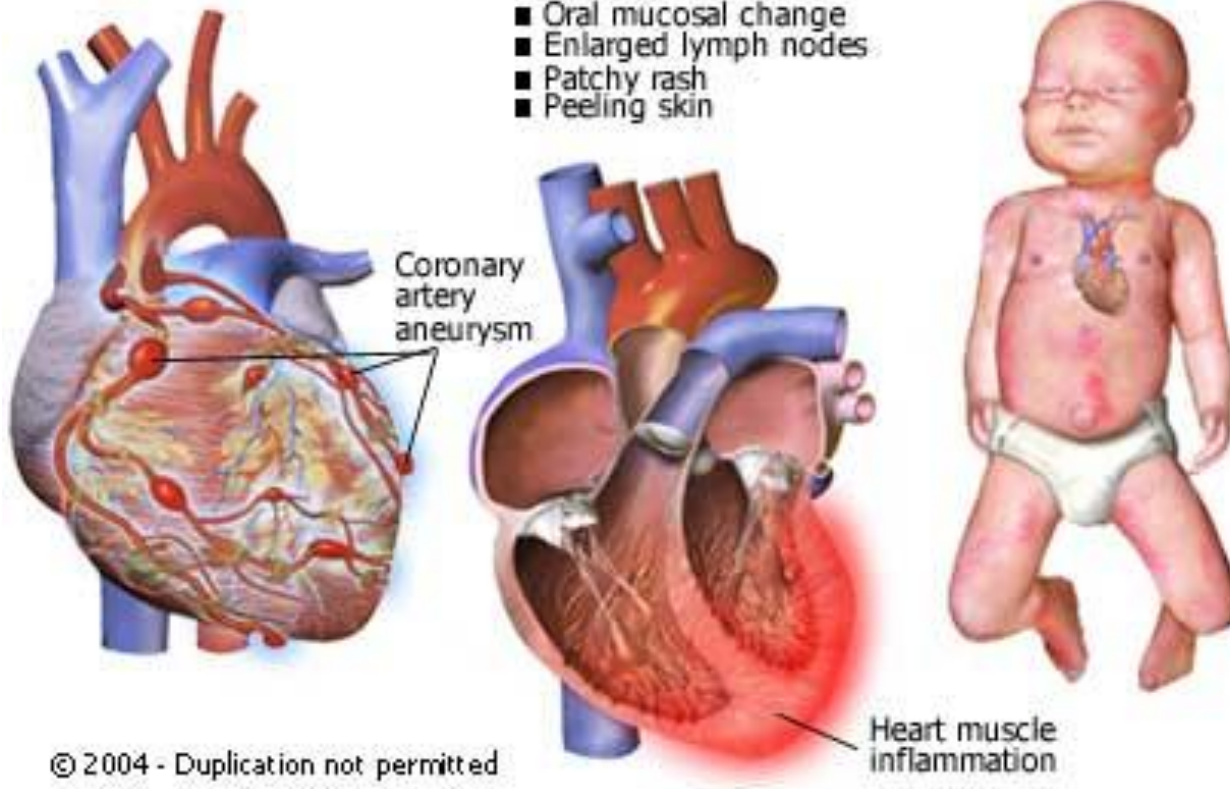
Kawasaki Syndrome: Coronary aneurysm

- 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



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Kawasaki Syndrome: Treatment

- Intravenous Immune Globulin 2g/kg x1
- Aspirin:
 - 80-100 mg/kg/day until fever \square x 14 day, then
 - 3-5mg/kg/day x \geq 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 $\approx 15\text{cm} \times \geq 1\text{-}2\text{ wks}$

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 painful
 - 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 ticks 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 meningococemia

- 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

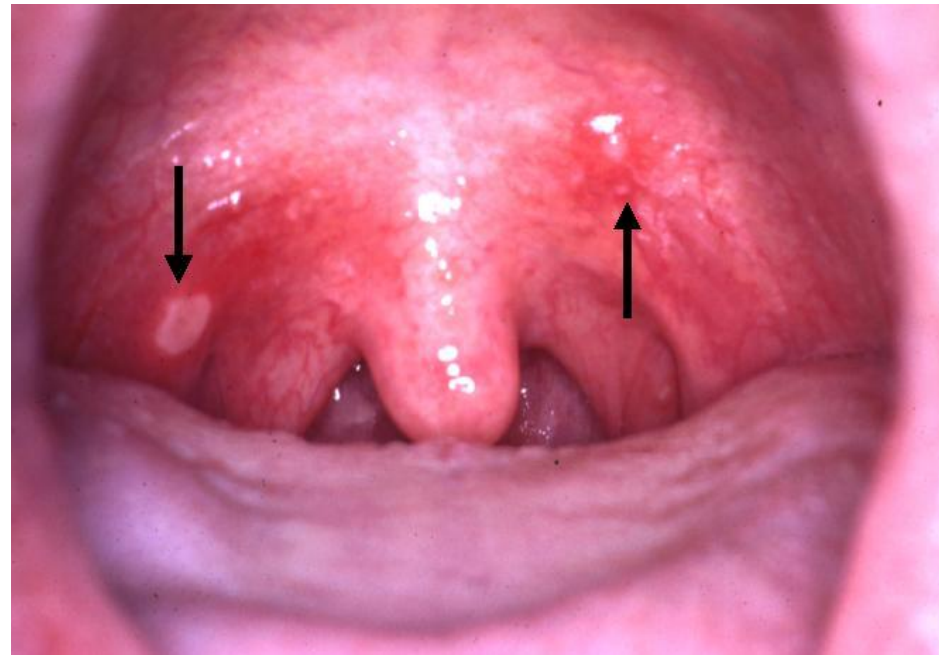
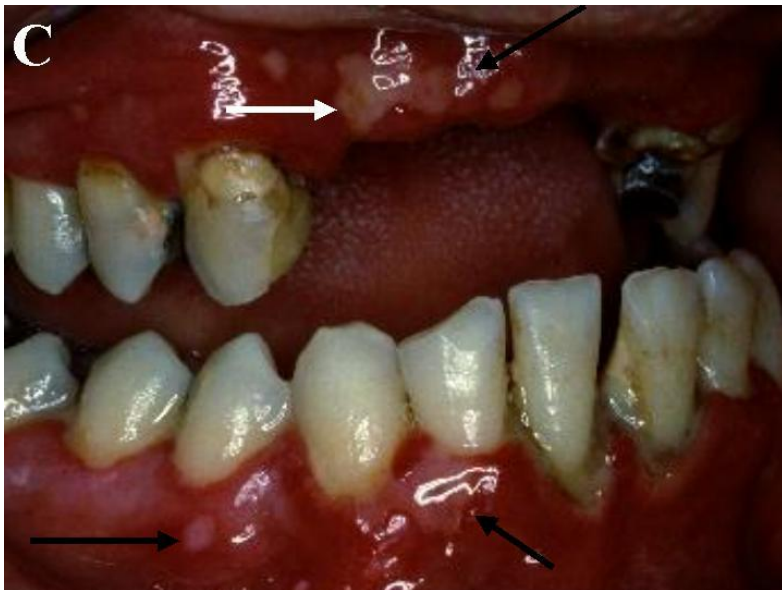
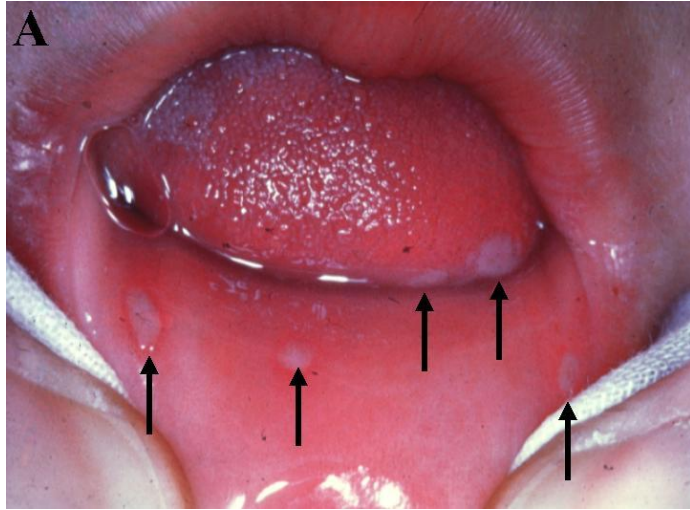
- 2-year-old male with rash to face & fever for three days. Rash worsening since onset.
- Has had this rash before.



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