

# Measles (Rubeola)

## Pathophysiology

1. Infection spread by respiratory droplets
  - Enters respiratory epithelium (CD46) -> regional lymph nodes/replicates
    - Incubation period: 7-12d
    - Communicable just before prodrome till 4d after rash appears
  - Viremia -> endothelial cell infection (Koplik spots) -> epithelial cell infection (rash)
  - Infects monocytes causing immunosuppression
    - Increased risks of severe bacterial pneumonia, Otitis Media
  - Life-long immunity s/p infection
  - See Vaccination schedules
    - Vaccination effectiveness in <1yo may be reduced by maternal antibodies
2. Epidemiology
  - 50 million cases worldwide/yr; 1 million deaths/yr
    - Returning in pockets of underimmunization
    - Up to 30% of adults may be at risk
  - Infectivity rate of 76%
3. Morbidity/mortality
  - Dehydration (diarrhea), pneumonia, croup, hepatitis, vit A deficiency, myocarditis, blindness
  - Acute encephalitis (0.1%, permanent brain damage, 10% mortality)
  - Delayed encephalitis in pts. w/lymphoid malignancies (usually fatal)
  - **Subacute sclerosing panencephalitis (SSPE):** rare degenerative, chronic disease
    - Behavioral, MS changes, seizures
    - Incubation period: 10.8 yrs (mean)

## Diagnostics

### 1. Symptoms

- Prodrome: cough, coryza, conjunctivitis
  - Fever (>101°F, may last 7-10d), photophobia, malaise
  - Increase in severity until 3-4d prior to rash
- Sx resolution in 7-10d

### 2. Physical exam

- **Koplik spots:** blue/white macules w/red base on premolar buccal mucosa
  - Pathognomonic; sloughs as rash appears
  - Last: 2-4d; appear: 24-48hrs prior to rash
- Erythematous maculopapular rash: face/ears -> trunk/extremities (w/in 24-36hrs)
  - Maximum at 3d; includes palms/soles
  - Fades to yellow-brown lesions in 5-10d (head downward)
  - May desquamate s/p 1wk; spares palms/soles
  - Severity of disease is directly related to extent and confluence of rash
- Generalized LAD, hepatomegaly, appendicitis
- Lymphadenopathy at angle to jaw and posterior cervical region

### 3. Diagnostic testing

- Labs
  - LFTs: if hepatitis suspected
  - LP: r/o meningitis if indicated
  - IgM up to first 72 hours of rash appearance
    - Repeat in 72 hours if still strong suspicion
    - Consider using CDC or state lab
- Diagnostic imaging
  - CXR: r/o pneumonia

### Differential Diagnoses

1. RMSF
2. Toxic shock
3. Kawasaki
4. Rubella
5. Roseola
6. Fifth Disease
7. Meningococemia
8. Drug eruptions

### Acute Treatment

1. Supportive care
  - Maintain adequate hydration
  - Consider IgG if pregnant, <1yo, immunocompromised
    - Consult infectious disease or gynecology
2. Vitamin A supplements
3. Measles vaccination
4. Empiric antibiotics if secondary infection only
5. Ribavirin (experimental): severe cases, immunocompromised, SSPE
6. Report all/suspected cases, adverse vaccine reactions to CDC/local health department

### Disposition

1. Admit
  - Pts. w/severe disease, secondary complications

### Further Management

1. Treat secondary complications as indicated
2. Airborne precautions
  - Up to 4d after rash starts in normal pts.
  - Entire disease for immunocompromised pts.
3. Diagnostic Testing
  - Contact CDC/local health department if IgM assay is positive

### Follow Up Care

1. Vaccine prophylaxis/IgG in exposed susceptible/immunocompromised
  - Give w/in 6d of exposure
  - See Acute Treatment
2. Healthcare workers should not work from 5-21d after exposure

3. Follow up with PCP as appropriate

4. Prevention

- Measles immunization as part of MMR series
- Refer to detailed MMR immunization information for details

**References**

1. Haas DM, et al. Rubella, rubeola, and mumps in pregnant women. *Obstet Gynecol* August 2005;106:295-300.
2. Nelson Textbook of Pediatrics, 17th ed., Copyright © 2004

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