



## Overview

- Definition
  - Acute, highly contagious, airborne disease caused by Paramyxoviridae ribonucleic acid (RNA) virus
  - While rare in the United States after the measles, mumps, and rubella (MMR) vaccine was introduced in 1965, it is the fifth leading cause of death worldwide in children <5 years of age
- Symptoms
  - Redness
  - Tearing
  - Blurry vision
  - Sudden loss of vision if + retinopathy, after rash
- Laterality
  - Bilateral
- Course
  - Self-limited; visual acuity may be affected by retinopathy initially, but generally recovery over weeks to months
- Age of onset
  - Children and young adolescents
- Gender/race
  - No gender or racial predilection
- Systemic association
  - Congenital measles
    - Infection during third trimester results in abortion in 20% of women
    - Premature birth common
    - Cardiopathy, pyloric stenosis, genu valgum, deafness, mongolism, vertebral anomalies, cleft lip/palate, rudimentary ear

- Acquired measles
    - Generalized rash for 3+ days
    - Classic Triad: Cough, coryza, and conjunctivitis
    - Possible complications: encephalitis, myocarditis, glomerulonephritis, otitis media, laryngotracheitis, pneumonia, disseminated intravascular coagulation, appendicitis
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## Exam: Ocular

### External

- Dacryostenosis (congenital measles only)

### Anterior Segment

- Mild, non-purulent papillary conjunctivitis
  - The most common ocular manifestation along with keratitis
  - +/- pseudomembrane
  - Stimson's line: sharply demarcated transverse injection of lower lid margin
- Epithelial keratitis
  - Begins at limbus and spreads centrally
  - Normal corneal sensation
  - Corneal scarring is cause of “post-measles blindness” worldwide
- Hirschberg spots: Koplik's spots at caruncle
- Cataracts (congenital measles only)

### Posterior Segment

- Retinopathy with salt and pepper pattern involving the posterior pole and periphery
  - 1–2 weeks after onset of body rash
- Neuroretinitis (blurry disc margin with possible star-shaped macular edema)
- Attenuated arterioles
- Scattered retinal hemorrhages

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## Exam: Systemic

- Rash starts as pink macules behind ear, on forehead, and on neck, then rapidly becomes maculopapular and spreads downwards over 3 days to face, trunk, arms, and legs

- Fever >101°F
- Respiratory mucosal inflammation with petechial lesions of palate and pharynx
- Koplik's spots of buccal mucosa (small, bluish-white spots surrounded by a red areola): 1–2 days after rash onset

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## Imaging

- FA
  - Windows defect from RPE changes
- ERG
  - Normal or mildly reduced response
- Perimetry
  - May be constricted

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## Laboratory and Radiographic Testing

- Viral culture by swabbing of nasopharynx and conjunctiva

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## Differential Diagnosis

### Congenital Measles

- TORCH infections
  - *Toxoplasmosis*
  - Other infections (syphilis, parvovirus, varicella zoster, Zika)
  - *Rubella*
  - *Cytomegalovirus*
  - *Herpes simplex*

### Acquired Measles

- Retinitis pigmentosa
- *Toxoplasma retinochoroiditis*
- Vogt-Koyanagi-Harada syndrome
- Other causes of neuroretinitis, including *Bartonella*, Lyme, leptospirosis, toxocarriasis, and mumps

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## Treatment

- No known treatment for congenital form

- For acquired form, gamma-globulin 0.25 mL/kg body weight recommended for high risk patients (pregnant, child <1 year, immunosuppressed)
  - Topical NSAIDs and artificial tears to reduce conjunctival hyperemia
  - Topical antibiotics to prevent secondary bacterial keratitis
  - Systemic corticosteroids for cases of severe retinopathy
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### **Referral/Co-management**

- Appropriate specialists for specific systemic complications