MMR-cy Me!

A Comprehensive Review of Mumps and Rubella

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Objectives

Describe the clinical presentation and transmission for mumps and rubella

Discuss appropriate testing options for diagnosis of mumps and rubella

Describe current vaccination recommendations

I have no financial relationships to disclose.

(Unfortunately)

MUMPS

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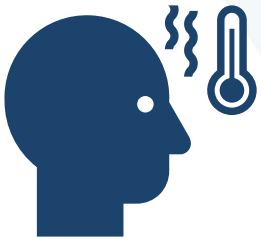
Mumps: Virus and Transmission

- Member of *Paramyxoviridae*
  - Includes hPIV types 2 and 4
- Humans are the only natural hosts
- Spread through direct contact with infectious respiratory secretions and saliva
- Incubation is 16-18 days (R: 12-25 days)
- Isolation: 5 days after parotid swelling onset

Mumps: Clinical Manifestations

- Pain/swelling of 1+ salivary gland
  - Parotids most common (95%)
  - May be unilateral…
    - and then later include contralateral gland (70%)
      - This may be delayed by weeks or months after apparent recovery

Mumps: Clinical Manifestations



Nonspecific antecedent symptoms

Fever

Anorexia

Malaise

Headache

May be asymptomatic

20% of unimmunized individuals

Unknown in immunized individuals

Mumps: Clinical Manifestations

- Less common symptoms
  - Orchitis
    - Post-pubertal (30% unimmunized / 6% immunized)
    - Unilateral involvement is common
    - Subsequent testicular atrophy (50%)
  - Clinical meningitis (< 1%)
    - However, 50% may have CSF pleocytosis

Mumps: Clinical Manifestations

- Rare complications
  - Oophoritis
  - Pancreatitis
  - Encephalitis
  - Hearing deficit (transient or permanent)
  - Arthritis
  - Glomerulonephritis
  - Myocarditis
  - Transverse myelitis

Mumps

- Unlike our friend Rubella, whom we will discuss later…
  - Mumps virus is known to cross the placenta
  - *However,* there is **no evidence of congenital malformation**

Mumps: Testing

- Classic
  - Serology (IgG and IgM)
    - Acute and convalescent
    - IgM may be transient
    - Among immunized individuals, IgG titer may sufficiently elevated to prevent detection of 4x increase

Mumps: Testing

- Nucleic Acid Amplification Tests (NAAT)
  - Improved sensitivity and specificity
  - Best within 1-3 days of symptom onset
  - Where to collect…
    - Buccal swab specimens
      - Stenson's duct secretions; massage parotid x 30 seconds prior
    - Throat/oral swabs
    - Urine
    - Cerebrospinal fluid

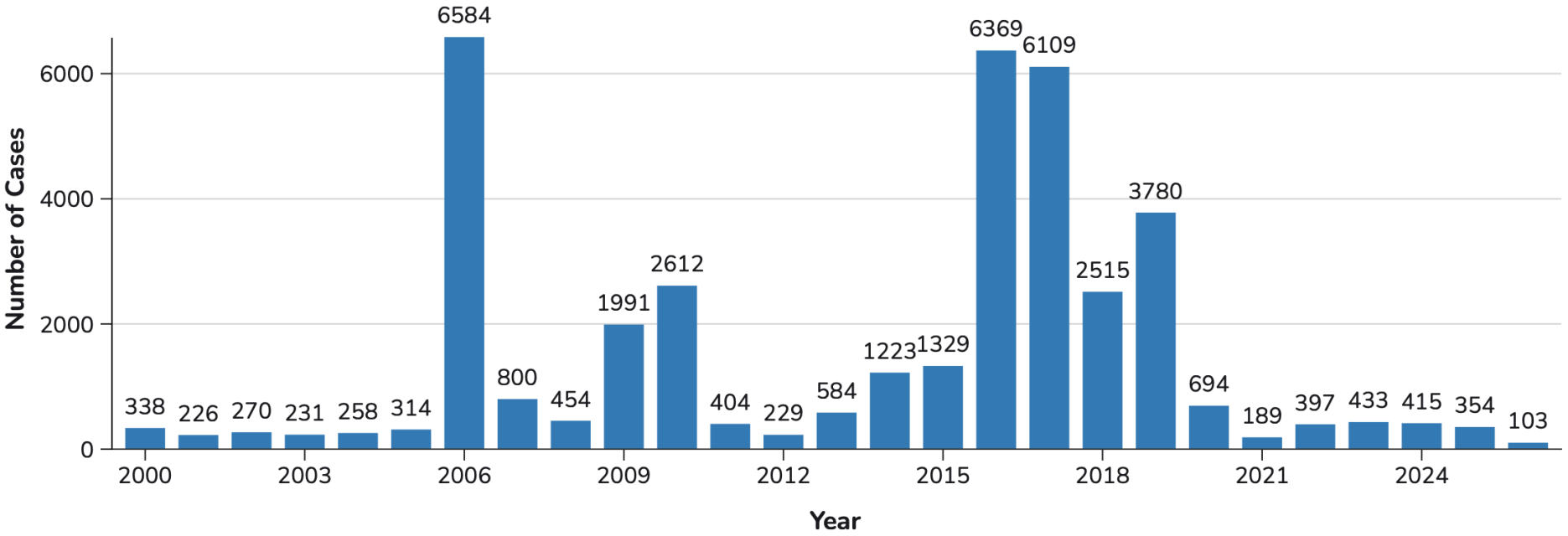
Mumps: Immunization

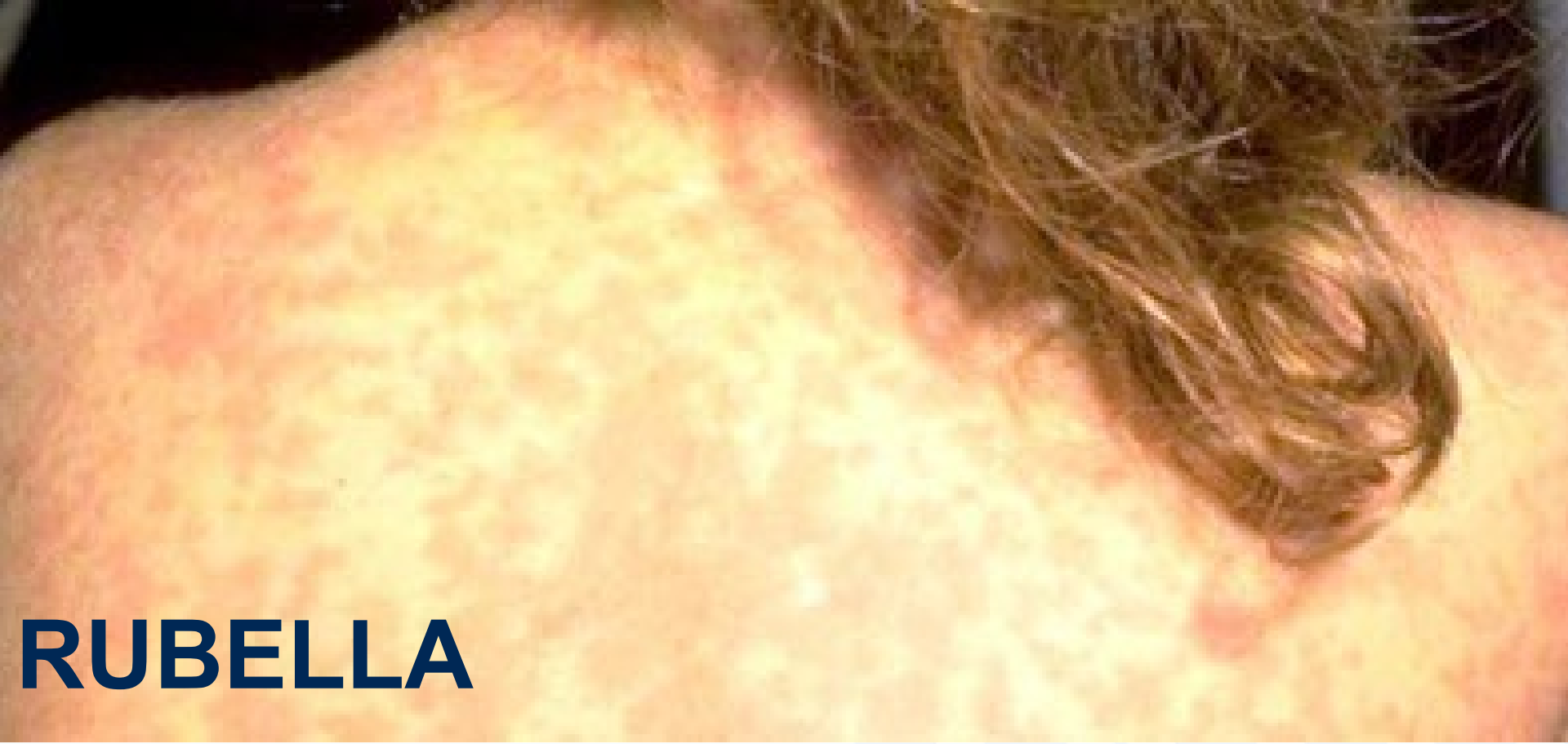
- Licensed 1967 and routine 1977
- MMR (1989)
  - Decreased cases by 99% (~300 reported cases/year)
  - 1 dose 72% effective / 2 doses 86% effective
- Reactions
  - Orchitis, parotitis, and low-grade fever

Mumps: Immunization

- Considerations for Administration
  - IVIG and blood products
  - Altered immunity
  - Corticosteroids
    - ≥ 2mg/kg/day over 14+ days
  - Tuberculosis disease and testing

Reported U.S. mumps cases by year (2000–2026)





RUBELLA

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Rubella: Virus and Transmission

- *Matoniviridae* Family; *Rubivirus*
- Humans are the only natural hosts
- Spread through direct contact or droplets from nasopharyngeal secretions
- Incubation is 17 days (R: 12-23 days)
- Isolation: 7 days after rash onset
    - *** Congenital disease more complicated isolation period

Rubella: Clinical Manifestations

Postnatal Rubella

- Many are subclinical
  - 25-50% of adults are asymptomatic
- Symptomatic illness (about 7-10d)
  - Low-grade fevers
  - Rash
  - Adenopathy
  - Mild Conjunctivitis, Cough, Coryza
  - Polyarthralgia/arthritis
  - Encephalitis

Congenital Rubella Syndrome

- Miscarriage or fetal death
- Congenital anomalies
  - Growth Restriction
  - Ophthalmologic
  - Neurologic
  - Auditory
  - Cardiac
  - Musculoskeletal
  - Hematologic
  - Dermatologic

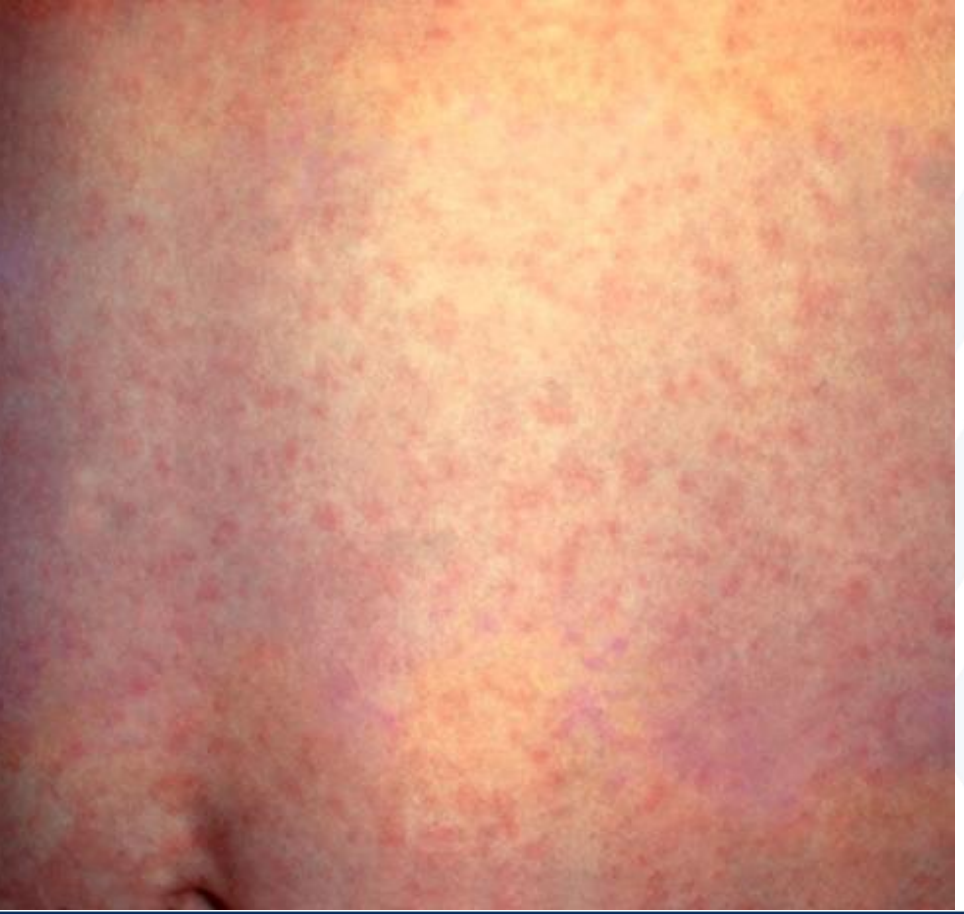
Rubella: Clinical Manifestations

Many are subclinical

- 25-50% of adults are asymptomatic

Symptomatic illness (about 3-10 days)

- Prodromal Symptoms (1-5 days before rash)
  - Conjunctivitis
  - Cough
  - Coryza
  - Polyarthralgia/arthritis
- Low-grade fevers
- Enanthem/Exanthem (1-5 days)
- Adenopathy
- Encephalitis



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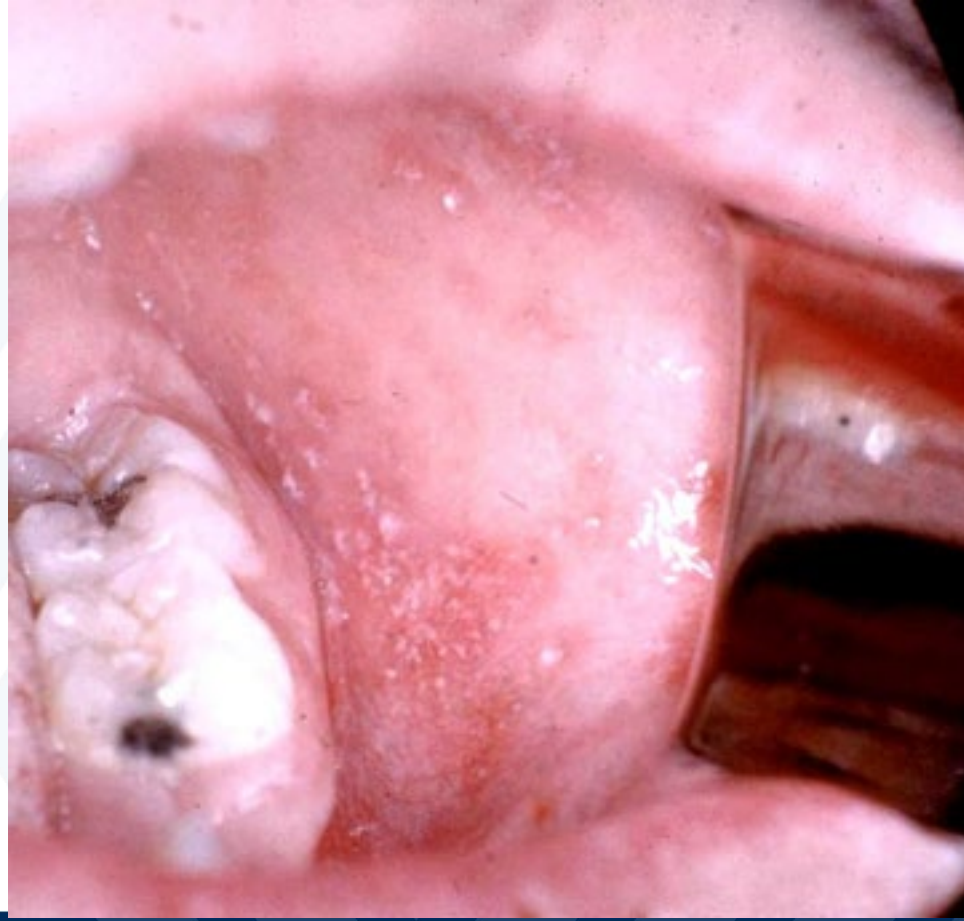
Rubella *vs* Rubeola



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Rubella *vs* Rubeola

RUBELLA – Post-auricular adenopathy

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Post-Rubella Thrombocytopenic Purpura

Rubella *vs* Rubeola

	RUBELLA	RUBEOLA (MEASLES)
TRANSMISSION	Respiratory Droplets, Contact	Airborne
INCUBATION	12-23 days	7-21 days
PRODROME	Mild F, lymphadenopathy, arthralgia	High F, cough, coryza, conjunctivitis
TEMPERATURE	Usually, < 101	Usually, > 101
ENANTHEM	Forchheimer spots	Koplik spots
EXANTHEM	Starts on face, spreads downwards Less red No desquamation No hyperpigmentation	Starts hairline, spreads downwards More red, coppery Desquamation Hyperpigmentation
DURATION OF RASH	~ 3 days	~6-7 days
COMPLICATIONS	Congenital Rubella Syndrome	Pneumonia; Encephalitis

Congenital Rubella Syndrome

- Miscarriage or fetal death
- Congenital anomalies
  - Growth Restriction
  - Ophthalmologic
  - Neurologic
  - Auditory
  - Cardiac
  - Musculoskeletal
  - Hematologic
  - Dermatologic

Congenital Rubella Syndrome

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Congenital Rubella Syndrome

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A

B

Congenital Rubella Syndrome

- Radiolucent metaphyseal bands

Rubella: Testing

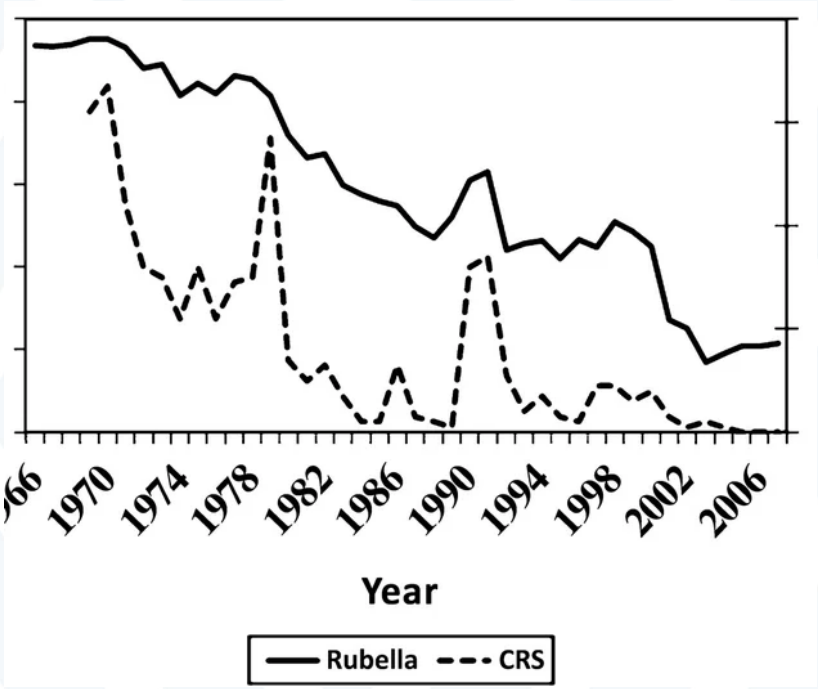
- Classic
  - Serology (IgG and IgM)
    - Most post-natal cases IgM(+) by 5 days after onset
    - Acute (1st) specimen should be collected as close to rash onset (prefer by day 3)
    - 2nd sample >10 days following 1st test to confirm/rule out if first is negative.

Rubella: Testing

- Nucleic Acid Amplification Tests (NAAT)
  - Improved sensitivity and specificity
  - Best within 1-3 days of symptom onset
  - Where to collect…
    - Nasopharyngeal or Throat Swabs (preferred)
    - Additional sites:
      - Blood
      - Urine
      - Cerebrospinal fluid
    - 2 specimens increase yield (example: NP + Urine)

Rubella: Immunization

- Vaccine licensed in 1969.
- 1 dose effective 97%
- Elimination in US 2004



Reef *et al. JID.* 2011; 204:S59307

Thank you!

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