Prior to the introduction of vaccine in 1963 measles was a common childhood illness in the U.S., and most people developed natural immunity before adulthood. As a result, persons born in the U.S. prior to 1957 are considered to have presumptive immunity to measles. Following the adoption of a two dose immunization schedule with MMR vaccine in 1989, measles incidence declined to record low levels, and in 2000 measles was declared no longer endemic in the U.S. Cases of measles continue to occur in the U.S. as a result of importation of the virus from other countries, with occasional secondary spread most often among unvaccinated or partially vaccinated persons. Immunity must remain high in a population if an absence of endemic transmission of measles is to be sustained. However, in addition to maintaining high vaccination rates, prompt recognition, reporting, and investigation of cases and contacts is essential to halt the spread of imported disease.

**Infectious Agent:** Measles virus (paramyxovirus)

**Incubation:** Average of 14 days (range 7 - 21 days) from exposure to onset of symptoms.

**Infectious Period:** Measles is highly infectious, with greater than 90% secondary attack rates among persons who are susceptible. Measles can be transmitted from 4 days before to 4 days after the appearance of the rash.

**Signs and Symptoms:** Measles begins with a prodrome which lasts 2-4 days and is characterized by fever, malaise, cough, coryza (runny nose and watery eyes), and conjunctivitis (eye inflammation and redness). Small spots with white or bluish white centers on an erythematous (red) base in the mouth (buccal mucosa or soft palate) called Koplik spots are specific for measles and may be seen on oral exam between day 2 and 6. A characteristic red, blotchy, palpable (maculopapular) rash appears on the third to the seventh day and typically begins on the face (at the hairline) and spreads over the body (may include the palms and soles), becoming generalized, and may coalesce in areas. The rash lasts 4 to 7 days and is typically not itchy. Complications that may result include diarrhea, otitis media (middle ear infection), pneumonia, and encephalitis (inflammation of the brain and/or spinal cord).

**Transmission:** Measles is transmitted person to person by respiratory droplets and through direct contact with nasal and throat secretions or items freshly soiled with these secretions. Airborne transmission via aerosolized droplet nuclei can also occur in enclosed areas up to two hours after an infected person has occupied the area. Measles is one of the most communicable infectious diseases.

**Susceptibility and Immunity:** Persons who have no history of measles and who have not been immunized are susceptible. Infants, pregnant women without evidence of immunity, and immunocompromised persons are particularly susceptible to disease. Measles infection confers lifelong immunity. Primary vaccine failure can occur in up to 5% of persons after one dose.
However more than 99% of persons who receive two doses of measles vaccine develop serologic evidence of immunity.

**Prophylaxis of Contacts:** Live virus vaccine (MMR), if given within 72 hours of measles exposure, may prevent disease among susceptible persons. Household or other contacts for whom risk of complications is very high and for whom measles vaccine may be contraindicated, (ie contacts under 1 year of age, pregnant women without evidence of immunity, and immunocompromised persons), should receive immunoglobulin (IG) within 6 days of exposure. *(See Appendix for post-exposure prophylaxis recommendations.)*

**Quarantine and Isolation:** Hospitalized patients with measles should be maintained under both standard precautions and airborne transmission precautions from onset of symptoms through 4th day of the rash if otherwise healthy and for the duration of illness if immunocompromised. Infants and n with measles should be kept out of childcare or school for 4 days after appearance of rash; ; adults should remain home from work and avoid public places during this time. Case-patients should avoid contact with anyone without documented measles immunity during their infectious period.

**Measles Case Investigation Guidelines for Public Health Practitioners:**

All suspect measles cases should be reported to the GA DPH Acute Disease Epidemiology Unit (404 657-2588) immediately if measles is suspected. If after hours please call 1-866-PUB-HLTH (24 hours/7 days a week). The following steps should be followed in the investigation of a suspect measles case:

1) If suspect – ISOLATE THE PATIENT promptly (in a negative pressure room if available). Suspect measles patients should be managed in a manner that prevents disease spread in the healthcare setting, i.e. using general and aerosol precautions *(http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf)*

2) Obtain a detailed description and timeline of the suspect case-patient’s clinical presentation to determine if consistent with measles:
   - History of cough, coryza and/or conjunctivitis including onset dates
   - Rash characteristics (characteristics of appearance, onset date, progression, distribution)
   - Documentation of Koplik’s spots (this is difficult but specific for measles if present)
   - Fever, including onset date, pattern, and maximum documented temperature in relation to symptoms above

3) Obtain an accurate immunization history (documentation of MMR - # of doses and dates), or history of measles, date of birth (considered immune if born before 1957)
   - Only written or electronic records of vaccination are acceptable documentation
   - Consider “unknown status” if not documented

4) Identify possible sources for infection – review activities during the 21 days prior to rash onset
   - Was the patient exposed to a confirmed or suspect measles case during that time?
• Did the patient travel (airline, especially any international travel) or visit an international airport in the past 21 days?
• Was the patient around foreign visitors (in the home, at a tourist attraction, international conference, healthcare setting, etc).

5) Collect the appropriate laboratory specimens to confirm the diagnosis. Contact the GA DPH Acute Disease Epidemiology Unit (404-657-2588) promptly if measles is suspected and collaborate to collect the appropriate specimens. Specimens should be submitted to the GA Public Health Laboratory as soon as possible. Refer to Measles: Specimen Collection and Shipping Instructions included. These should include:
  • Blood for serology (measles IgG and IgM antibodies)
  • Throat swabs for virus isolation and PCR
  • Urine specimen for virus isolation and PCR

6) Continue to complete the epidemiologic investigation in collaboration with the GA DPH. Note that several of these steps should be conducted simultaneously.
  • Ensure isolation of case and quarantine of immediate contacts until susceptibility is assessed.
  • Determine the dates for the period of communicability (4 days before and 4 days after rash).
  • Interview case to obtain a detailed history of activities during the period of communicability, identify possible contacts (i.e. household, school, childcare, work, healthcare facilities, airplane) and venues, and obtain phone numbers when possible (see Period of Communicability Timeline below).
  • If exposure to others in a hospital ER waiting room or healthcare facility has occurred, work with facility personnel to identify persons in attendance at the time the case-patient arrived and up through 2 hours following appropriate isolation of the suspect patient.
  • Interview contacts to determine susceptibility (obtain age, determine if contact has been immunized with 2 doses of measles vaccine, or has had the disease as diagnosed by a physician, determine if pregnant/immunocompromised). Refer to Measles – Assessment of Potential Exposure – Contact Tracing to document information.
  • Stratify by time of exposure to determine the appropriateness and type of prophylaxis (refer to Algorithm for Determining Measles Prophylaxis for Exposed Persons included); be aware of contraindications; IG must be given within 6 days of exposure and MMR within 72 hours.
  • If period of prophylaxis has passed, counsel susceptible contacts to call their health practitioner if they develop respiratory symptoms and/or a rash, and report their exposure.
  • Work with GA DPH and State Pharmacy (district pharmacies in certain districts) to ensure availability of adequate IG.
  • Follow-up with individuals to ensure they received prophylaxis (IG or vaccine).

7) Notify other districts of measles contacts in their areas.

8) Conduct surveillance for secondary cases and contacts.