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DEPARTMENT OF HEALTH SERVICES  
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## **Guide for Measles Case/Outbreak Investigation and Control-For Use With “Measles (Rubeola) Case/Contact Investigation Form-California” (DHS7057)**

**Immunization Branch, November 1996**

### **INTRODUCTION**

1. Use of case/contact form helps organize investigation and control.
2. Equipment to take on measles case field visits: case report forms, materials for serum and viral isolation specimen collection, vaccine and materials for immunization of contacts.

### **INVESTIGATION TO ESTABLISH DIAGNOSIS**

1. Call or visit case/family within 24 hours (48-72 hours if weekend).
2. Do not simply take doctor’s word on diagnosis. Interview case/family on symptoms experienced, including those listed on case/contact form. See California Morbidity, #15/16, 4/21/95, “Measles (Rubeola) Diagnosis Tips.”
3. Phone call interview can quickly rule out obvious non-cases. For the others, home visit can help in evaluating rash and Koplik’s posts, evaluating immunization records of contacts, and promptly immunizing susceptibles.
4. Minimal clinical criteria for measles are listed on case/contact form. Cases meeting these criteria should be treated as measles in terms of public health response, unless other features strongly suggest that measles is not the diagnosis.
5. While one must act promptly on clinical diagnosis alone to manage contacts of cases, serologic confirmation of the diagnosis should be sought.

**Measles IgM antibody:** Best time to draw blood is 3-28 days after rash onset. May be present at rash onset and may last up to 6 weeks. Presence of measles IgM antibody in any one serum specimen confirms diagnosis. **Caution:** False-positive results do occur in some laboratories using commercial test kits. If unsure about positive results, obtain repeat specimen for state lab to test (IgM present up to six weeks after rash onset).

**Measles IgG or total antibody:** Draw acute blood within 7 days after rash onset and convalescent blood 10-14 days later. Significant rise in antibody concentration (check for the testing laboratory’s definition of a significant rise) between the acute and convalescent specimens confirms the diagnosis.

**Note:** Recent measles immunization produces essentially the same IgM and IgG antibody responses as do natural measles infection.

**Virus Isolation:** (Used for research to determine measles virus strain circulation.) Within 7 days of rash onset collect urine specimen in sterile container, or within 4 days of rash onset obtain nasopharyngeal swab and place in tube of viral transport medium. Keep on wet ice and ship to State Viral and Rickettsial Disease Laboratory as soon as possible. Results available in 2-3 months.

6. If case is reported over 14 days after rash onset, still investigate; if minimal clinical criteria met, identify individual and group contacts and determine if any have become ill with measles.

### **POSSIBLE INFECTION SOURCE**

1. By counting back and forward from rash onset date and entering the dates indicated in the "Probable Exposure and Infectious Period" section, one can define when the patient was exposed to measles and when he/she has been infectious (shedding measles virus).
2. Ask case/family about all examples listed on case/contact form (relative, friend, neighbor, co-worker, schoolmate, visitor, etc.). Also, ask about travel in exposure period.
3. Investigate other possible cases thus discovered, using the investigation/control guidelines.

### **INDIVIDUAL CONTACTS TO CASE IN INFECTIOUS PERIOD**

#### **I. IDENTIFICATION**

1. Contact definition: Born in 1957 or later; in same room as case or other personal contact with case in infectious period (four days before to four days after rash onset).
2. Ask about all examples of possible contacts listed on case/contact form (relatives, friends, neighbors, co-workers, schoolmates, teammates, play group, etc.).

#### **II. ISOLATION INSTRUCTIONS**

1. If less than 14 days have elapsed since exposure to the case, all contacts should receive isolation instructions, even if immunized.
2. Instructions: During second week after exposure, at first sign of possible measles (fever, runny nose, cough, or eyes bothered by light), **STAY HOME**. Do not attend school, preschool, work, church, clubs, meetings, parties, baby-sitting group, etc. **AVOID ALL ROOM CONTACT WITH CHILDREN AND YOUNG ADULTS IF AT ALL POSSIBLE**. If it is measles, you will know it in a day or so by the severity of the illness. Call health department **IMMEDIATELY** (give the phone number) to report this illness.

3. Susceptible contacts should stay home and avoid children and young adults for entire second week after exposure, even though not ill, if feasible.
4. If illness occurs in a contact and a visit to a physician or clinic is made, the physician/clinic should be informed ahead of time that this is a possible measles case, which should be isolated and not allowed to be exposed to other patients or susceptible staff.
5. If less than four days have elapsed since rash onset, case should be given isolation instructions for balance of this four-day period.

### **III. SUSCEPTIBLE CONTACTS – IDENTIFICATION AND MANAGEMENT**

1. Definition: In addition to being born in 1957 or after and being in contact with the case during the infectious period, susceptible contacts are those who lack a written record showing dates of receipt of at least two doses of measles-containing vaccine (e.g., MMR) received on or after the first birthday, or a written record of measles seropositivity.
2. Immunization:
  - a. Immunize directly in the field (preferable) or refer to physician/clinic for immunization.
  - b. Measles vaccine is not effective if given over 2-3 days after exposure but should be given anyway to prevent illness from future exposures.
  - c. Use of combined MMR vaccine is preferred since the source case may possibly have rubella rather than measles, since use of combined vaccines immunizes against multiple diseases, and since repeat doses of any component cause no known harm.
  - d. Females of childbearing age: Ask if they are pregnant. If they say “no”, warn them to avoid pregnancy for three months, and then immunize. While MMR vaccine has never been observed to harm the fetus, for theoretical reasons we avoid giving live vaccines to pregnant women.
  - e. There is no upper age limit beyond which measles vaccine is harmful, though few persons born before 1957 are susceptible.
3. Immune globulin (IG=ISG=GG): May prevent or modify illness if given within six days after first exposure. Dose is 0.11 ml/lb. (0.25 ml/kg) body weight, intramuscularly. Intramuscular injection of this much IG can be painful. Can split the dose and give at 2-3 different sites (e.g., each buttock and lateral thigh muscle).

IG provides protection for only 2 - 2-1/2 months and is thus used only **AFTER** exposure. Give IG rather than vaccine to the following **EXPOSED** persons:

- i. Known or presumed susceptible pregnant females.
- ii. Immunodeficient or immunosuppressed persons – refer these persons to physicians for IG administration, if possible.
- iii. Infants under age 12 months. (The measles case-fatality rate is higher in this age range, so that the more certain post-exposure protection provided by IG is preferred to that of post-exposure vaccine.) For exposed infants under age 6 months, IG prophylaxis may not be necessary if the mother has a firm history of prior measles or measles immunization. If there is any doubt, give the infant IG.

Five months after IG administration, persons who received IG prophylaxis and who are not pregnant or immunodeficient, and are 12 months of age or older should receive MMR.

#### **IV. SURVEILLANCE FOR ILLNESS**

All contacts, especially susceptibles, should be kept under surveillance for 15 days after last exposure to see if they develop measles. Ask them to call (give your phone number) at first sign of illness. Check with them again at the end of their incubation period. Often, when contacts are clustered among friends, neighbors, or relatives, by keeping in contact with just one parent one can keep tabs on all of them. If measles develops, start investigation/control procedure on new case(s).

#### **GROUP CONTACTS TO CASE IN INFECTIOUS PERIOD**

1. Ask case/family about group contacts (examples listed on case/contact form) about exposure in infectious period.
2. Isolation instructions, identification and management of susceptibles, and surveillance procedures are the same as those for individual contacts. Susceptible in a group should not attend group functions during the second week after exposure.
3. School or childcare center with exposure to measles – Often best managed by local health department Immunization Program Coordinator.
  - a. Obtain within two days a list of excludable susceptibles – pupils without a record showing at least month and year of measles immunization on or after the first birthday. Thus, the excludable pupils are those with a) no immunization record; b) immunization before the first birthday; c) record showing only year of immunization or check mark for measles vaccine; d) record showing vaccine received in month of first birthday and only month and year of immunization provided so one cannot tell if it was before or after the

first birthday; e) personal beliefs or medical exemption to measles immunization (unless medical exemption includes written statement from physician that pupil had measles disease). Health and Safety Code, Section 120375 (c), and Education Code, Section 49076, give health departments access to school immunization records.

- b. Inform families of susceptible pupils by a notice sent home with the pupil or by phone that they must obtain immunization and/or provide the school with evidence of *immunization* within two days.
- c. Exclude pupils who remain unimmunized past this deadline. For those with legal exemptions who choose not to be immunized, exclusion generally should continue *for 14 days after the last day that the last case was in attendance while infectious*. For pupils out of compliance with the legal immunization requirements, exclusion is indefinite – until they come into compliance. (California Administrative Code, Title 17, Sections 2512 and 6060 allow health officer to order exclusion).
- d. Immunization clinics at the health department should be available on the exclusion date and for a few days thereafter. If necessary, hold an on-site immunization clinic at school or childcare center on the exclusion date.
- e. **In addition, in school and college case/outbreak episodes, pupils who received only ONE MMR vaccine dose should be strongly urged to be reimmunized right away. An on-site immunization clinic at school helps increase compliance with this recommendation, as should the warning that if the outbreak continues, receipt of a second MMR vaccine dose may have to be made mandatory.**

## **PUBLICITY**

1. Medical community – Physicians, clinics, and emergency rooms in the outbreak area should be alerted to the outbreak and a) urged to telephone report immediately all possible, suspected, and confirmed measles cases; b) urged to isolate at entry to their facilities all outpatients with rash and fever or other indications of possible measles illness so as not to expose other patients or susceptible staff; and c) informed of outbreak control measures being undertaken by the health department, such as reimmunization of school pupils who have received only one MMR vaccine dose.
2. Lay community – News media releases alerting the public to the outbreak, urging young adults to check their own immunization records and parents of children age 12 months and older to check their children’s immunization records and to seek immunization if needed, urging persons with symptoms of measles to call the health department, etc., can be helpful.
3. Medical Care Facilities Visited by Measles Case(s). See California Morbidity, #13/#14, April 7, 1995, titled “measles (Rubeola) Prevention and Control – Recommendations for Health Care Providers and Facilities.”