**MEASLES**

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<th>Animal Group(s) Affected</th>
<th>Transmission</th>
<th>Clinical Signs</th>
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<td>Primates, including humans; especially susceptible are colobus monkeys, macaques, and callitrichids</td>
<td>Aerosol</td>
<td>Fever, conjunctivitis, cough, and characteristic rash. Other signs of encephalitis and gastroenteritis/colitis.</td>
<td>Highly contagious with variable species morbidity and mortality.</td>
<td>None aside from symptomatic care.</td>
<td>Proper quarantine of animals; wearing proper protective equipment, especially when known exposure to disease. Vaccination can be considered for non-human primates.</td>
<td>Yes</td>
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**Fact Sheet compiled by:** Natalie D. Mylniczenko  
**Sheet completed on:** 29 January 2011; updated 10 September 2013  
**Fact Sheet Reviewed by:** Deidre Fontenot; Erika Travis-Crook

**Susceptible animal groups:** All primates – human and non-human, although humans are the only known reservoir, are affected; in humans, usually young children or immunocompromised adults infected. Non-human primates are susceptible with variable morbidity and mortality that is species specific and affected by individual animal health status. With some non-human primate species, only seroconversion occurs.

**Causative organism:** Measles: paramyxoviridae-morbillivirus (also known as rubeola). It is an enveloped, single stranded RNA virus.

**Zoonotic potential:** Yes

**Distribution:** Worldwide, but now it is considered a foreign disease in the US as it was eliminated in 2000. Despite this status, a number of outbreaks occur each year, usually secondary to travel abroad and then spread due to lack of vaccination in groups of children.

**Incubation period:** Infectious 5-21 d post exposure.

**Clinical signs:** Disease is often asymptomatic. When clinical signs are present, they resemble influenza such as nasal and ocular discharge, and conjunctivitis. Diarrhea may be present, especially in New World monkeys. Occasionally, dermatitis is present, and rarely Koplick spots or stomatitis. Facial edema, blepharitis and erythema have been documented. Measles is immunosuppressive, therefore other diseases may confound diagnosis. Encephalitis, although rare, occurs acutely and has a rapid clinical course. Rarely further in macaques, abortion can be observed.

**Post mortem, gross, or histologic findings:** Exanthematous rash is noted grossly. In callitrichids, gastritis and enterocolitis is observed. Evidence of encephalitis is observed with acute measles. Syncytial cell formation and giant cell pneumonia is observed histologically. In macaques that abort, endometritis can be rarely observed.
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**Diagnosis:** Serology IgM and IgG (paired titers with 4 fold increase in IgG titer or if IgM is found), immunofluorescence (urine), viral isolation.

**Material required for laboratory analysis:** Serum is preferred (frozen or fresh), although plasma is accepted at some labs. Tissue samples - see specific labs for their requirements - are usually oropharyngeal swabs, nasal lavage, or urine.

**Relevant diagnostic laboratories:** PCR and ELISA testing on varying sample types (contact each group for their requirements) can be done at the following facilities.

Centers for Disease Control and Prevention Measles Virus Laboratory  
DASH #81 Att: Dr. Bellini  
1600 Clifton Road  
Atlanta, Georgia 30333  
404-639-1156 or 404-639-3512  
Fax: 404-639-4187  
jrota@cdc.gov  

VRL-San Antonio  
P.O. Box 40100  
7540 Louis Pasteur, Suite 200  
San Antonio, Texas 78229  
877-615-7275  
Fax: 210-615-7771

Primate Diagnostic Services Laboratory (PDSL)  
Washington National Primate Research Center  
University of Washington  
Seattle Washington 98195-7330  
diagnostic@wanprc.org

Pathogen Detection Laboratory  
California National Primate Research Center  
University of California  
Road 98 & Hutchison  
Davis, California 95616  
(530) 752-8242  
Fax: (530) 752-4816  
PDL@primate.ucdavis.edu

Zoologix Inc.  
9811 Owensmouth Avenue, Suite 4  
Chatsworth California 91311-3800  
818-717-8880  
Fax: 818-717-8881  
info@zoologix.com  
http://zoologix.com/primate/index.htm
### MEASLES

**Treatment:** Supportive or symptomatic care, as no specific treatments are available.

**Prevention and control:** Vaccination has minimum age for humans of 1 year and booster is recommended to booster at least 4 weeks later although can be administered up to 4-6 years after the initial vaccinations (See http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm#hcp). Vaccination in gorillas has shown positive serologic responses. Colobus have been vaccinated without adverse effects per SSP veterinary advisor reports. Vaccination against canine distemper virus in macaques has shown effective protection against measles. Human handlers should be properly vaccinated against disease. According to human guidelines set by the CDC, pregnant women should not be vaccinated with MMR*; however, this concern is based on miscarriage or premature birth occurring in women with actual disease (http://www.cdc.gov/vaccines/pubs/preg-guide.htm).

*Note: monovalent measles vaccine is no longer available in the US so can only be obtained in polyvalent combinations, particularly MMR (Measles, Mumps, & Rubella).

**Suggested disinfectant for housing facilities:** Short lived virus, so routine disinfection is usually sufficient.

**Notification:** While this disease is not notifiable in animals, it is a human reportable disease.

**Measures required under the Animal Disease Surveillance Plan:** While this disease is not notifiable in animals, it is a human reportable disease.

**Measures required for introducing animals to infected animal:** Once exposed, the animal has a natural immunity and will not become re-infected. Typically, primates contract disease from human handlers.

**Conditions for restoring disease-free status after an outbreak:** The disease has a rapid spread and short course with no animal reservoirs.

**Experts who may be consulted:**
Centers for Disease Control and Prevention
1600 Clifton Rd
Atlanta, GA 30333
1-800-CDC-INFO (800-232-4636)

**References:**
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