



## CYTOMEGALOVIRUS

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE?	TREATMENT	PREVENTION & CONTROL
Macaques, capuchin monkeys, woolly monkeys, squirrel monkeys, tamarins, baboons, Afr. green monkeys, chimpanzees, gorillas, owl monkeys, tarsiers and slow lorises	Horizontally through body secretions: saliva, blood, urine, milk, semen.  Vertically : intrauterine.	Usually asymptomatic in humans and non-human primates. Can cause symptoms as: fever, jaundice, elevated liver enzymes, dyspnoea, neurological signs in monkeys.	No. Immuno compromised people and non-human primates have a higher risk of developing symptoms, like prolonged fever and (mild) hepatitis.	No, only symptomatic. In humans Ganciclovir is used	Test animals serologically during quarantine period.

<b>Fact sheet compiled by</b> Marno Wolters, AAP Sanctuary for Exotic Animals, Almere, the Netherlands & Artis Zoo Amsterdam	<b>Last update</b> November 2008
<b>Fact sheet reviewed by</b> Manfred Brack, Byron Martina	
<b>Susceptible animal groups</b> Non-human primates, humans CMV is endemic in many human populations (50-85% of the adult population in the USA)	
<b>Causative organism</b> Species-specific Cytomegaloviruses (Beta herpes viruses). Already classified: Cercopithicine herpes virus 3 (SA-6), Cercopithicine herpes virus 4 (SA-15), Cercopitheicine herpes virus 5 (African green monkey CMV) and Cercopitheicine herpes virus 8 (Rhesus monkey CMV)	
<b>Zoonotic potential</b> Virus is believed to have a narrow host range; interspecies transmission does occur, however less easily than other cytolytic herpes viruses	
<b>Distribution</b> Common in non-human primates; found universally in all geographic locations and socio-economic groups in humans	
<b>Transmission</b> Mainly horizontally through body fluids, intrauterine infections occur in humans and non-human primates	
<b>Incubation period</b> Not exactly known. Virus can hide in glandular tissue, lymphoreticular cells and kidneys	
<b>Clinical symptoms</b> Fever, jaundice, dyspnoea, diarrhoea, neurological signs	
<b>Post-mortem findings</b> Disseminated lesions in the brain, lymph nodes, liver, spleen, kidney, small intestine, nervous system, arteries. Characteristic viral (intranuclear) inclusion bodies. Neutrophilic infiltrates in meninges and gastrointestinal tract	
<b>Diagnosis</b> Serology (IgM, IgG), virus isolation, PCR, atypical cells with intranuclear inclusion bodies in saliva and urine. Elevated liver enzymes	
<b>Material required for laboratory analysis</b> Serum, for CMV antibodies and PCR. Blood chemistry (ALAT, ASAT, ALP)	
<b>Relevant diagnostic laboratories</b> Institute of Virology, Erasmus Medical Centre, Rotterdam, the Netherlands	
<b>Treatment</b> None; symptomatic. Humans: Ganciclovir	



<b>Prevention and control in zoos</b> Serology (antibodies against CMV virus) during quarantine period
<b>Suggested disinfectant for housing facilities</b>
<b>Notification</b> Not compulsory
<b>Guarantees required under EU Legislation</b>
<b>Guarantees required by EAZA Zoos</b>
<b>Measures required under the Animal Disease Surveillance Plan</b>
<b>Measures required for introducing animals from non-approved sources</b>
<b>Measures to be taken in case of disease outbreak or positive laboratory findings</b>
<b>Conditions for restoring disease-free status after an outbreak</b> Virus will persist within groups
<b>Contacts for further information</b> Prof. dr. A.D.M.E. Osterhaus, Dr. B. Martina, Institute of Virology, Erasmus Medical Centre, Rotterdam, the Netherlands
<b>References</b> <ol style="list-style-type: none"><li>1. Asher, D.M. Gibbs, C.J, Lang, D.J., and Gajdusek, D.C. (1974). Persistent shedding of cytomegalovirus in the urine of healthy rhesus monkeys. Proc. Soc. Exp. Biol. Med. 145, 794-801</li><li>2. Baskin, G.B. (1987). Disseminated cytomegalovirus infection in immunodeficient rhesus monkeys. Am. J. Pathol. 129, 345-352</li><li>3. London, W.T., Martinez, A.J., Houff, S.A., Wallen, W.C., Curfman, B.L., Traub, R.G., and Sever, J.L. (1986). Experimental congenital disease with simian cytomegalovirus in rhesus monkeys. Teratology 33, 323-331</li><li>4. Sequar G, Britt WJ, Lakeman FD, Lockridge KM, Tarara RP, Canfield DR, Zhou SS, Gardner MB, Barry PA. Experimental coinfection of rhesus macaques with cytomegalovirus and simian immunodeficiency virus: pathogenesis. J virol. 2002 Aug; 76(15), 7661-71.</li><li>5. Tandler B. Cytomegalovirus in the parotid gland of a slow loris, Nycticebus coucang. J Submicroc. Pathol. 1997 Jul; 29(3), 423-6</li></ol>