



PNEUMOCOCCOSIS

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
Mostly macaques and chimpanzees	Aerogenously	Bronchopneumonia, meningitis, meningoencephalitis	Yes	Penicillin (Increasing Penicillin-resistance!)	<i>In houses</i> Prevention of contact with sick persons or sick animals <i>in zoos</i> prevention of contact with sick people or animals

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Susceptible animal groups Mostly macaques and chimpanzees, 1 x <i>Lagothrix</i> sp.	
Causative organism <i>Streptococcus (Diplococcus) pneumoniae</i> with > 84 serotypes. <i>D. pneumoniae</i> is the only alpha- haemolytic streptococcus with optochin – susceptibility and desoxycholate – solubility.	
Zoonotic potential Theoretically yes.	
Distribution World – wide.	
Transmission Aerogenous (droplet infection).	
Incubation period In experimentally infected mice: < 96 hs.	
Clinical symptoms Bronchopneumonia: respiratory distress, shivering, inappetence, often symptomless death; meningitis / meningoencephalitis: anorexia, lethargy, incoordination, paralysis, nystagmus, tremor, seizures.	
Post mortem findings Fibrinous bronchopneumonia / lobar pneumonia, pleuritis, pericarditis; fibrinous meningitis necrotizing cerebral vasculitis with extension into adjacent nervous tissues.	
Diagnosis Cultivation (Trypticase soy broth or Trypticase soy agar); capsular swelling reaction.	
Material required for laboratory analysis Sputum, altered tissues.	
Relevant diagnostic laboratories Local medical laboratories.	
Treatment Penicillin (increasing penicillin, cephalosporin, and macrolide resistance of pneumococci !).	
Prevention and control in zoos Prevention of contact with persons or animals suffering from upper respiratory disease.	
Suggested disinfectant for housing facilities	
Notification	



Guarantees required under EU Legislation
Guarantees required by EAZA Zoos
Measures required under the Animal Disease Surveillance Plan
Measures required for introducing animals from non-approved sources
Measures to be taken in case of disease outbreak or positive laboratory findings
Conditions for restoring disease-free status after an outbreak
Experts who may be consulted
References <ol style="list-style-type: none">1. Brack, M. 1987. Agents Transmissible from Simians to Man. Springer, Berlin, Germany.2. Copps, J., S. Jacobs, B. Smits, and D. Percy. 1994. Diagnostic exercise: Meningoencephalitis in <i>Macaca fascicularis</i>. Lab. Anim. Sci. 44: 372-373.3. Gilbert, S. G., K. R. Reuhl, J. H. Wong, and D. C. Rice. 1987. Fatal pneumococcal meningitis in a colony-born monkey (<i>Macaca fascicularis</i>) J. Med. Primatol. 16: 333-338.4. Graczyk, T. K., M. R. Cranfield, S. E. Kempske, and M. A. Eckhaus. 1995. Fulminant <i>Streptococcus pneumoniae</i> meningitis in a lion tailed macaque (<i>Macaca silenus</i>) without detected signs. J. Wildl. Dis. 31: 75-78.5. Hedlund, J. 1997. Should pneumococcal infections continue to be classified as a single disease? Lancet 349: 371-372.6. Henderson, J. D. jr., W. S. Webster, B. C. Bullock, N. D. M. Lehner, and T. B. Clarkson. 1970. Naturally occurring lesions seen at necropsy in eight woolly monkeys (<i>Lagothrix</i> sp.). Lab. Anim. Care 20: 1087-1097.7. Hsueh, P.-R., L.-J. Teng, L.-N. Lee, P.-C. Yang, S.-W. Ho, and K.-T. Luh. 1999. Dissemination of highlevel penicillin-, extended-spectrum cephalosporin-, and erythromycin-resistant <i>Streptococcus pneumoniae</i> clones in Taiwan. J. Clin. Microbiol. 37: 221-224.8. Jurek, V., J. Pur, and M. Persin. 1990. Meningitis purulenta als Todesursache bei einem Schimpanse. Verh. ber. Erkr. Zootiere 32: 25-26.9. Keeling, M. E., W. B. Bonner, and H. M. McClure. 1971. Pneumococcal meningitis in a chimpanzee. Primate Zoonoses Surv. Rep. 3: 10-11.10. Keeling, M. E., and H. M. McClure. 1974. Pneumococcal meningitis and fatal enterobiasis in a chimpanzee. Lab. Anim. Sci. 24: 92-95.11. Klumpp, S. A., and H. M. McClure. 1993. Pneumococcal meningitis. In: Jones, T. C., U. Mohr, and R. D. Hunt (eds). Nonhuman Primates. II. Monographs on Pathology of Laboratory Animals. Springer, Berlin, Germany. Pp. 169-1173.12. Solleveld, H. A., M. J. van Zwieten, P. J. Heidt, and P. M. C. A. van Eerd. 1984. Clinicopathologic study of six cases of meningitis and meningoencephalitis in chimpanzees (<i>Pan troglodytes</i>). Lab. Anim. Sci. 34: 86-90.13. Tomasz, A. 1995. The pneumococcus at the gates. N. Engl. J. Med. 333: 514-515.14. Tuomanen, E. I., R. Austrian, and R. H. Masure. 1995. Pathogenesis of pneumococcal infection. N. Engl. J. Med. 332: 1280-1284.