

## ANGIOSTRONGYLOSIS

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
Mainly New World monkeys (naturally in rats !)	Perorally via mollusc vectors	Lethargy, Ataxia, incoordination, tumorlike masses, death	Yes	Mebendazole (Cave: anaphylactic shock!)	<i>In houses</i>  <i>in zoos</i>  Physical removal of infected slugs, snails, crabs etc.

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<b>Susceptible animal groups</b> Callitrichidae, Cebidae, 1 x <i>Hylobates lar</i> , <i>Lemur variegatus</i> , <i>Miopithecus talapoin</i> , rats, man.	
<b>Causative organism</b> <i>Angiostrongylus costaricensis</i> , <i>A.cantonensis</i> .	
<b>Zoonotic potential</b> Only indirectly through slugs.	
<b>Distribution</b> Central- and South America, South East Asia,China,Hawaii, (Africa, Europa ?).	
<b>Transmission</b> Perorally via uptake of larvae-containing slugs ( <i>Vaginulus plebius</i> ) or fresh-water snails ( <i>Achatina</i> sp , <i>A. fulica</i> ). <i>Pamacea canaliculata</i> ). <i>A. cantonensis</i> also through freshwater prawns, land crabs, frogs etc.	
<b>Incubation period</b> Prepatent period : 4 weeks.	
<b>Clinical symptoms</b> Lethargy, ataxia, palpable abdominal masses, incoordination in walking, death. In man: headache, stiffness, vomiting, myalgia ( cranial nerve palsies III, IV, VI, VII)	
<b>Post mortem findings</b> <i>A. costaricensis</i> : mesenteric tumor-like,larvae containing granulomas, otherwise congested lungs, eosinophilic meningoencephalitis.	
<b>Diagnosis</b> Necropsy, serology (IF or EIA), CSF leocytosis	
<b>Material required for laboratory analysis</b> Altered tissues.	
<b>Relevant diagnostic laboratories</b> Local parasitological /pathological laboratories.	
<b>Treatment</b>  Repeatedly Mebendazole (5 mg/kg). Cave : The death of migrating larvae after anthelmintic treatment may increase inflammatory and anaphylactic responses .	
<b>Prevention and control in zoos</b> Physical removal of slugs and snails from animal and public contact.	
<b>Suggested disinfectant for housing facilities</b>	
<b>Notification</b>	
<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>
<b>Experts who may be consulted</b>
<b>References</b> <ol style="list-style-type: none"><li>1. Aguiar, P. H., P. Morera, and J. Pascal. 1988. First record of <i>Angiostrongylus cantonensis</i> in Cuba. <i>Am. J. Trop. Med. Hyg.</i> 30 : 963 – 965.</li><li>2. Aguilar, R. F., K. Topham, J. J. Heatley, D. Nichols, J. Cross, R. Bauer, and M. Garner. 1999. Neural angiostrongylosis in nonhuman primates : Diagnosis, treatment and control of an outbreak in Southern Louisiana. <i>Am. Assoc. Zoo Vet. Annu. Conf. Proc.</i> 1999 : 272 – 276.</li><li>3. Alicata, J. E. 1991. The discovery of <i>Angiostrongylus costaricensis</i> as a cause of human eosinophilic meningitis. <i>Parasitol. Today</i> 7 : 151 – 153.</li><li>4. Andersen, E., D. J. Gubler, K. Sorensen, J. Beddard, and L. R. Ash. 1986. First report of <i>Angiostrongylus costaricensis</i> in Puerto Rico. <i>Am. J. Trop. Med. Hyg.</i> 35 : 319 – 322.</li><li>5. Anon. 1998. <i>Angiostrongylus (Parastrongylus) cantonensis</i> persists in southern USA. <i>Trop. Med. Hyg. News</i> 48 (1,2,3) : 15.</li><li>6. Baird, J. K., R. C. Neafie, L. Landie, and D. H. Connor. 1987. Abdominal angiostrongyliasis in an African man : Case study. <i>Am. J. Trop. Med. Hyg.</i> 37 : 353 – 356.</li><li>7. Brack, M. 1987. <i>Agents Transmissible from Simians to Man.</i> Springer, Berlin.</li><li>8. Brack, M., und M. Schröpel. 1995. Angiostrongylosen nichthumaner Primaten. <i>Verh. ber. Erkr. Zootiere</i> 37 : 201 – 204.</li><li>9. Campbell, B. G., and M. D. Little. 1988. The finding of <i>Angiostrongylus cantonensis</i> in rats in New Orleans. <i>Am. J. Trop. Med. Hyg.</i> 38 : 568 – 573.</li><li>10. Gardiner, C. H., S. Wells, A. E. Gutter, L. Fitzgerald, D. C. Anderson, R. K. Harris, and D. K. Nichols. 1990. Eosinophilic meningoencephalitis due to <i>Angiostrongylus cantonensis</i> as the cause of death in captive non-human primates. <i>Am. J. Trop. Med. Hyg.</i> 42 : 70 – 74.</li><li>11. Ko, R. C. 1978. Occurrence of <i>Angiostrongylus cantonensis</i> in the heart of a spider monkey. <i>J. Helminthol.</i> 52 : 229.</li><li>12. Mota, E. M., and H. L. Lenzi. 1995. <i>Angiostrongylus costaricensis</i> life cycle : a new proposal. <i>Mem. Inst. Oswaldo Cruz</i> 90 : 707 – 709.</li><li>13. Pascal, J. E., R. P. Bouli, and H. Aguiar. 1981. Eosinophilic meningoencephalitis in Cuba, caused by <i>Angiostrongylus cantonensis</i>. <i>Am. J. Trop. Med. Hyg.</i> 30 : 960 – 965.</li><li>14. Rambo, P.R., A. A. Agostini, and C. Graeff – Teixeira. 1997. Abdominal angiostrongyliasis in southern Brazil –prevalence and parasitic burden in mollusc intermediate hosts from eighteen endemic foci. <i>Mem. Inst. Oswaldo Cruz</i> 92 : 9 – 14.</li><li>15. Shan, L. V., Yi Zhang, P. Steinmann, and Xiao-Nong Zhou. 2008. Emerging angiostrongylosis in mainland China. <i>Emerg. Infect. Dis.</i> 14 : 161 – 164.</li><li>16. Terada, M., H. Kino, C. V. Akyol, and M. Sano. 1993. Effects of mebendazole on <i>Angiostrongylus costaricensis</i> in mice , with special reference to the timing of treatment. <i>Parasitol. Res.</i> 79 : 441 – 443.</li></ol>