## Genotype identification of toxoplasma gondii in macropods from a zoological park in Florida, USA.

Spriggs M, Jiang T, Gerhold R, Stedman N, López-Orozco N, Su C.

Journal of Zoo and Wildlife Medicine. 2020 Mar;51(1):131-9.

**Bennett's wallaby is found dead with no premonitory signs soon after a severe rainstorm. What is your top infectious differential? What treatment has been successful in this species? What is the definitive host?**

Toxoplasma gondii; atovaquone; felids

**PREVALENCE AND POTENTIAL IMPACT OF TOXOPLASMA GONDII ON THE ENDANGERED AMARGOSA VOLE (*MICROTUS CALIFORNICUS SCIRPENSIS*), CALIFORNIA, US**

Amanda Poulsen, Heather Fritz, Deana L Clifford, Patricia Conrad, Austin Roy, Elle Glueckert, Janet Foley

J Wildl Dis, 53 (1), 62-72 Jan 2017

**What is the definitive host and infective stage of *Toxoplasma gondii*?**

1. Canids; sporozoites
2. Racoons; tachyzoites
3. **Felids; oocysts**
4. Canids; bradyzoites
5. Felids; trophozoites

Question 1

Fleas are an important vector of Yersinia pestis. What genus of flea is most common in the prairie dog?

Answer: Oropsylla

Question 2

Which predator of the prairie dog is also highly susceptible to sylvatic plague (Yerisinia pestis) infections?

Answer

black-footed ferrets (mustela nigripes)

Leptospira, parvovirus, and toxoplasma in the North American river otter (*Lontra canadensis*) in North Carolina, USA.

Sanders, C.W., Olfenbuttel, C., Pacifici, K., Hess, G.R., Livingston, R.S. and DePerno, C.S.

*Journal of wildlife diseases*, 2020;56(4):791-802.

**Practice Question**

Which of the following Nother American river otters (*Lontra canadensis*) living in North Carolina has the highest probability of contracting *Toxoplasmosis gondii*?

1. 1 yo male
2. 5 yo male
3. 1 yo female
4. 5 yo female

*T gondii* has not been detected in *L canadensis* in North Carolina

Flea parasitism and host survival in a plague-relevant system: theoretical and conservation implications.

Eads, D. A., Abbott, R. C., Biggins, D. E., & Rocke, T. E.

*The Journal of Wildlife Diseases*, 2020;56(2):378-387.

**Practice Question**

In which category of prairie dogs (*Cynomys parvidens*) in Utah are fleas likely to be most abundant?

1. Female prairie dogs
2. Juvenile prairie dogs
3. Prairie dogs in good body condition
4. Prairie dogs that are re-encountered yearly
5. Prairie dogs living in a ‘dry’ year preceded by a ‘wet’ year

Answer: E

Guthrie, Amanda, et al. "Newly described Toxoplasma gondii strain causes high mortality in red necked wallabies (Macropus rufogriseus) in a zoo." *Journal of Zoo and Wildlife Medicine* 48.3 (2017): 694-702.

**Abstract:** This manuscript describes an outbreak of fatal toxoplasmosis in wallabies. Ten adult red necked wallabies (*Macropus rufogriseus*) were imported from New Zealand to the Virginia Zoo. **Agglutination testing upon admission into quarantine showed all animals to be negative for antibodies to Toxoplasma gondii. Nine of these wallabies died from acute toxoplasmosis within 59–565 (average 224) days after being moved onto exhibit.** *Clinical signs included lethargy, diarrhea, tachypnea, and ataxia that progressed rapidly; death without premonitory signs occurred in one case*. **Histopathologic examination revealed interstitial pneumonia, encephalomyelitis, myositis, enteritis, and myocarditis.** The diagnosis was confirmed through serologic, histopathologic, and polymerase chain reaction (PCR) testing. Multilocus PCR-RFLP (restriction fragment length polymorphism) **genotyping revealed that the first six animals were infected by a previously undiscovered Toxoplasma gondii genotype, designated as ToxoDB PCR-RFLP genotype No. 263.** These six cases survived for an average of 118 days on exhibit before succumbing to toxoplasmosis. The other three wallabies were infected with a Toxoplasma gondii strain of ToxoDB PCR-RFLP genotype No. 4, which is a common strain type circulating in wild animals in North America. These three cases survived for an average of 435 days on exhibit before succumbing to toxoplasmosis. The outbreaks of toxoplasmosis in these wallabies are likely from two different sources. Furthermore, the results highlight Toxoplasma gondii PCR-RFLP genotyping in parasite diagnosis and understanding parasite transmission and potential mitigation procedures.

Question:

What is considered to be the main source of *Toxoplasma gondii* infection in zoo housed red necked wallabies (*Macropus rufogriseus*)?

1. Consumption of tissue cysts from infected meat.
2. Environmental contamination with felid feces.
3. Transmammary infection of joeys.
4. Arthropod vector transmission.
5. Exposure to urine of wild rodents.

Ans: B

Girling, Simon J., et al. "USE OF CLINDAMYCIN IN PALLAS'CATS [OTOCOLOBUS (FELIS) MANUL] TO REDUCE JUVENILE TOXOPLASMOSIS-ASSOCIATED MORTALITY RATES." *Journal of Zoo and Wildlife Medicine* 51.1 (2020): 39-45.

**Abstract:** Pallas' cat [*Otocolobus* (*Felis*) *manul*] experiences a high mortality rate from toxoplasmosis. During the period 2006–2016, the overall mortality rate for this species from all causes during the first year of life was 71.59% in European Association of Zoos and Aquaria institutions, with the most significant infectious cause from systemic toxoplasmosis (20.6%) as confirmed by postmortem examination and histopathology. Clindamycin was used starting in 2014 in two collections that had previously experienced 100% mortality rates by toxoplasmosis in kittens less than one year of age, covering key *Toxoplasma gondii* exposure periods for kittens (*n* = 17) as a prophylactic measure. This protocol resulted in a 67.03% (95% confidence interval 41.76–78.61%) reduction in the first year mortality rate over a two-year period to 5.88% in those animals treated.

Question:

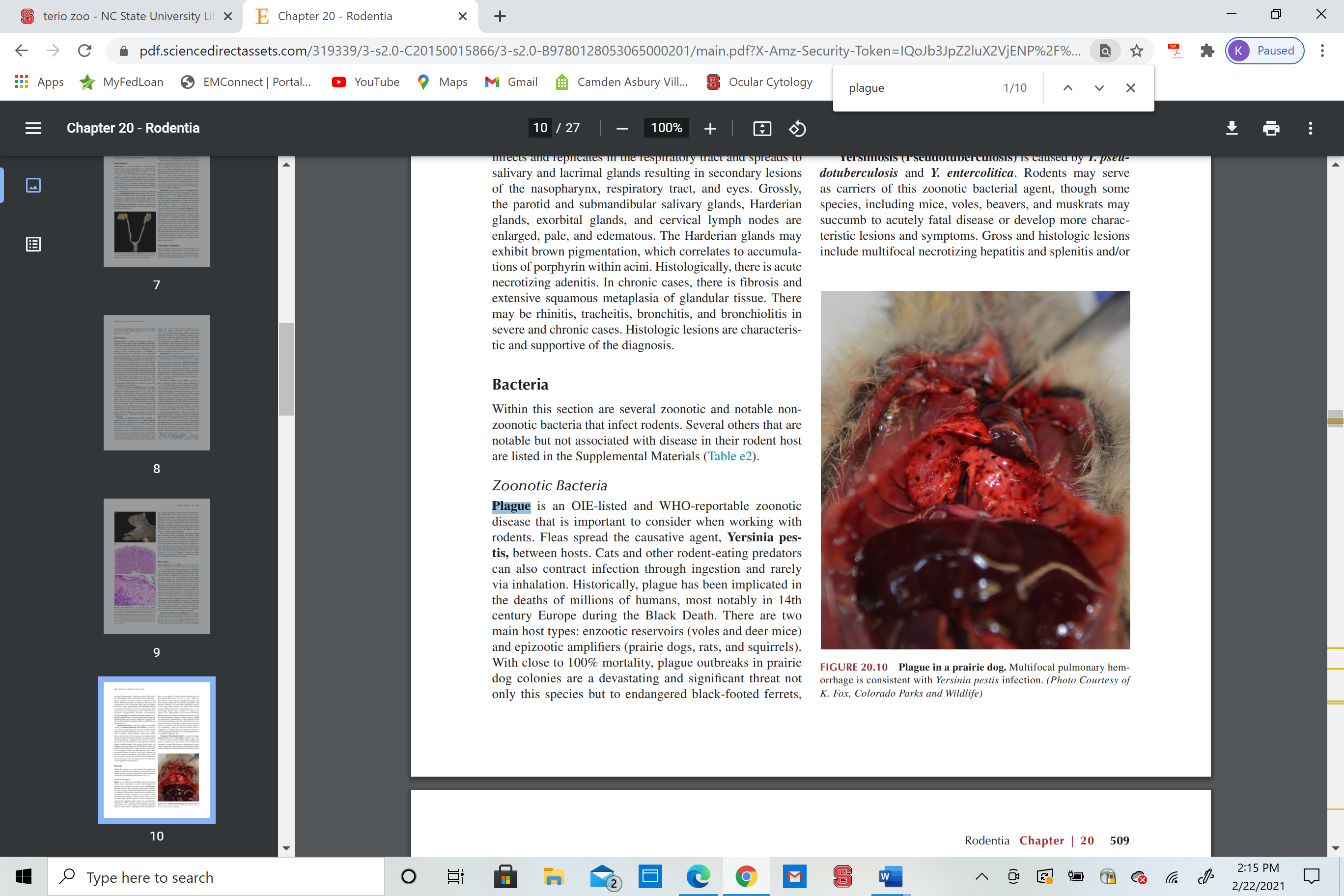
Which of the following drugs successfully reduced mortality rates of Pallas’ cat (*Otocolobus felis manul*) kittens when used for prophylactic treatment of *Toxoplasma gondii*?

1. Pyrimethamine
2. Diclazuril
3. Clindamycin
4. Ponazuril
5. Trimethoprim sulfa

Ans: C

Questions:

1. Which of the following was found during a *Toxoplasma gondii* serologic study in arctic foxes (*Vulpes lagopus*) in Canada?
   1. Young foxes (< 2 years old) had the highest seroprevalence
   2. Vertical transmission is limited to litters from mothers exposed for the first time in pregnancy
   3. All seropositive animals remained seropositive at subsequent captures
   4. All seropositive females had seronegative pups
   5. *Toxoplasma gondii* does not cause clinical disease in this species
2. There have been multiple deaths in a black tailed prairie dog colony. You observe these multifocal pulmonary hemorrhages on necropsy. Given the history, signalment, and observed lesions, what is your top differential? Describe the different manifestations of this disease.



*Yersinia pestis*

-bubonic (lymphadenomegaly with abscessation)

-pneumonic (necrotizing pneumonia with fibrinous pleuritis)

-septicemic (multifocal necrosis of liver, lung, spleen, kidney, eye, brain)