

Avian Malaria and Other VBDs of Concern to Zoos – Dr. Allison Wack

- a) Issues
 - i) Wide variety of species
 - ii) Lots of non-natives
- b) Malaria
 - i) Protozoan parasite
 - ii) Many different types of animals affected
 - iii) Many different vectors
 - iv) Human malaria
 - (1) *Anopheles* vector
 - (2) Number of imported cases is increasing
 - (3) Wide variety of symptoms
 - v) Bird malaria
 - (1) Primarily vectored by *Culex* spp
 - (2) Worldwide except Antarctica
 - (3) 40 known species
 - (4) Chronic infection
 - (5) Issue for naive species
 - (a) Non-native birds in zoos
 - (i) Penguins
 - (ii) Snowy owls
 - (b) Introduction of mosquito/parasite to new environment
 - (i) Big problem in Hawaii
 - (ii) Work done by Dennis LaPointe and others
 - (6) Clinical signs
 - (a) Lethargy
 - (b) Anorexia
 - (c) Anemia
 - (d) Acute death
 - (7) Management
 - (a) Prophylaxis during mosquito season
 - (b) Exclusion of mosquitoes - indoor exhibits
 - (c) Promotion of natural immunity
 - (i) Allow exposure for several mosquito season
 - (ii) Look at blood smears
 - (iii) Treat when the bird becomes positive
 - (iv) Bird develops a natural immunity
 - (d) Vaccination
 - (i) Only effective for a year
 - (ii) Natural infection creates life-long immunity
 - (8) New issues
 - (a) 2 species seen
 - (i) *P relictum*
 - (ii) *P longatum*
 - (b) Could a new species have been introduced?

c) Arboviruses

i) WNV

- (1) Most mortality in 2001-2003
- (2) All in avian species
- (3) 2011 - epornitic in crows and Cooper's hawks

ii) EEE

- (1) No history at zoo
- (2) Birds are usually asymptomatic but exotics can become ill and die
- (3) Disease more common in mammals, especially in equids

iii) Vaccination program

- (1) All new birds are vaccinated for WNV for at least 2 years
- (2) Combo vaccine for mammals at risk

d) Lyme disease

i) Chimpanzee

- (1) Low on social hierarchy
- (2) Not terribly social

ii) Presented with lethargy and shifting leg lameness

iii) Unusual as great apes do a lot of grooming

iv) No previous cases had been reported

v) Looked at rest of chimps

- (1) 4 of 9 were positive
- (2) All ages and both sexes
- (3) Data will be published