Diagnosis and Management of *Strep zoo* Infections in Shelters

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Strep zoo

- *Streptococcus zooepidemicus* [“Strep zoo”]
- Lancefield group C beta-hemolytic strep bacteria
- Emerging as a significant pathogen of concern for shelter dogs and cats
  - 2007 - 2012: 1st reports of deadly Strep zoo infections in shelters and sancuaries
  - UF Shelter Med Program has assisted 23 shelters with Strep zoo infections in the past 10 years

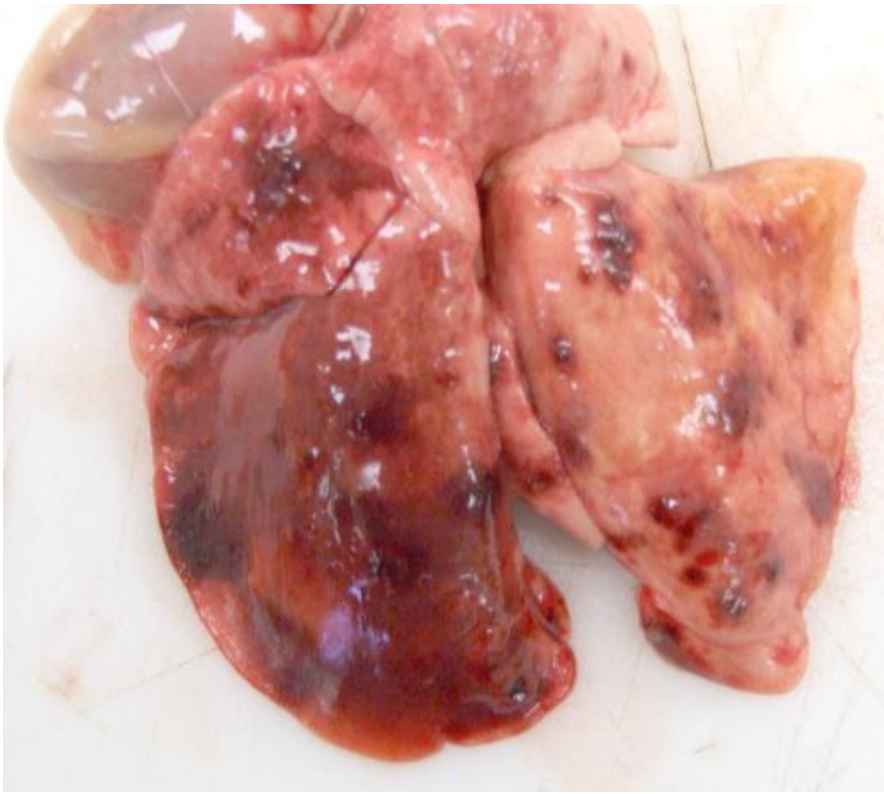
Strep zoo is a Normal Commensal

- Normal flora in healthy horses and ruminants
  - Skin
  - Upper respiratory tract
  - Urogenital tract
- Normal flora in dogs and cats
  - Uncommon commensal in healthy dogs and cats (<2%)*
  - Acquired from contact with colonized horses?
  - Skin
  - Upper respiratory tract

* Acke.ACVIM Forum.June 2011

Strep zoo is an Opportunistic Pathogen

- Horses and ruminants
  - Abscesses
  - Pneumonia
  - Uterine infections
  - Mastitis
  - Arthritis
- Dogs and cats
  - Dogs: fatal hemorrhagic pneumonia
  - Cats: fatal pneumonia and meningoencephalitis
- Unknown why some animals are healthy carriers and others suffer disease

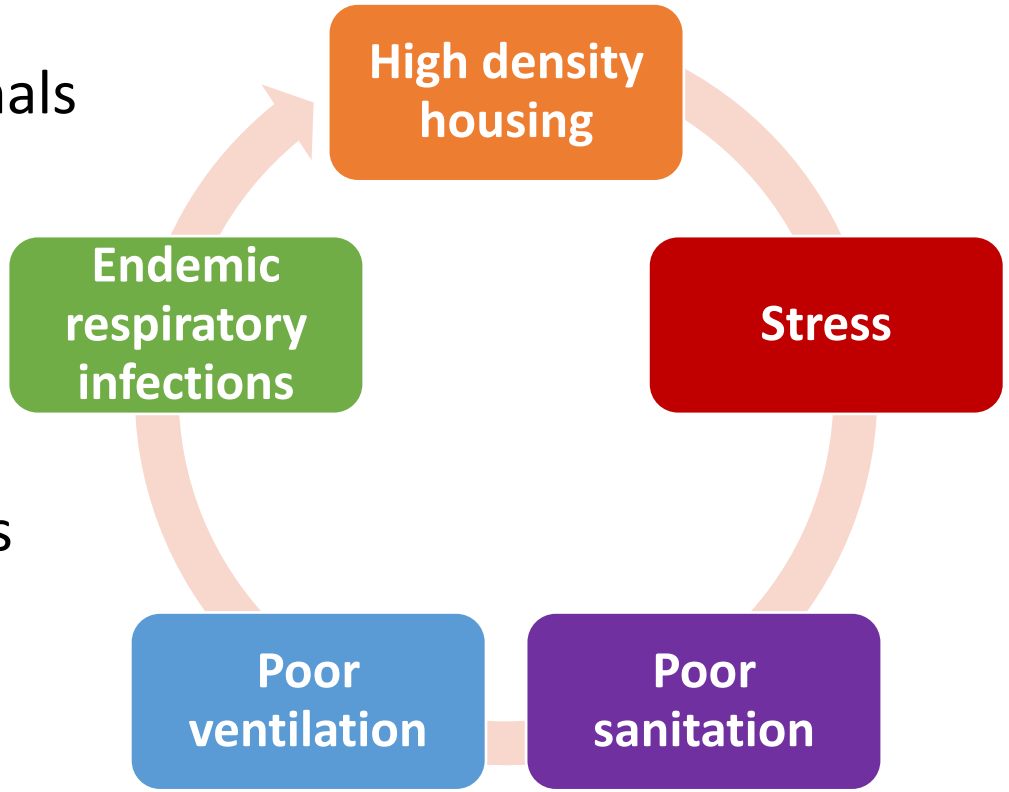


Strep zoo Transmission

- Carriers shed bacteria in oronasal secretions (and feces?)
- Bacteria remain viable in the environment for several days
  - Survival enhanced by biofilms and feces
  - Inactivated by routine disinfectants
- Exposure and colonization
  - Direct contact with carriers
  - Contact with contaminated environments
  - Aerosols generated by coughing and sneezing
- Zoonotic but low transmission potential

Risk Factors for Strep zoo Infections

- Exceeding housing capacity
  - Increased direct contact between animals
  - Ineffective sanitation
  - Decreased ventilation and air quality
  - Irritated airways
- Endemic respiratory infections
  - Damaged respiratory epithelial barriers
  - Paralyzed mucociliary apparatus
  - Increased access and invasion by commensal or environmental bacteria



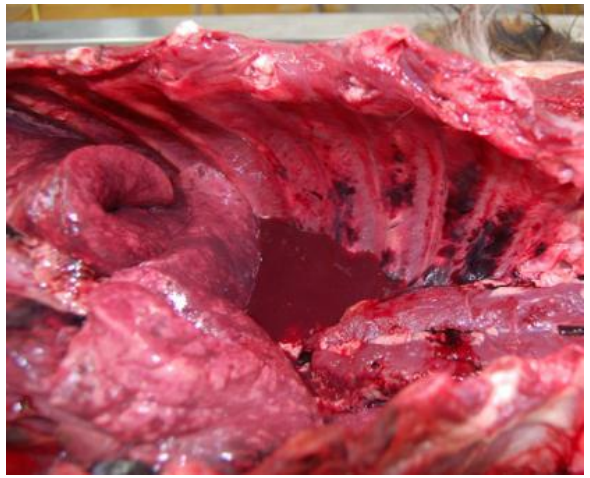
Primary or Secondary Pathogen?

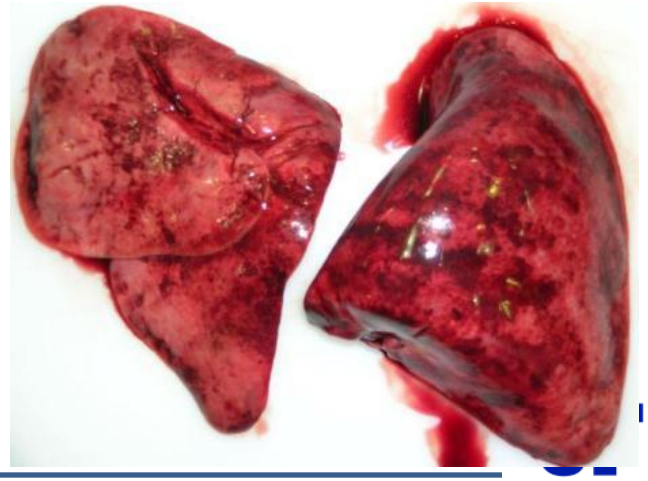
- Dogs
  - CDV, CnPnV, H3N2 CIV infections predispose to Strep zoo co-infection
  - Recent Strep zoo infections without underlying viral infections
- Cats
  - Crowded conditions with URI from endemic FHV and FCV
  - Shelters
  - Sanctuaries
  - Hoarding environments

Sanctuary	# Cats	Tested Cats w/ Strep zoo
FL 2009	584	13%
PA 2010	387	76%
FL 2011	708	33%
FL 2012	696	93%
TOTAL	2,375	55%

Clinical Disease in Dogs

- Sudden death
  - Healthy-appearing dogs found dead in kennel
  - Hemorrhage from nose and mouth
- Postmortem
  - Hemothorax
  - Severe fulminant necrotic hemorrhagic pneumonia





Clinical Disease in Dogs

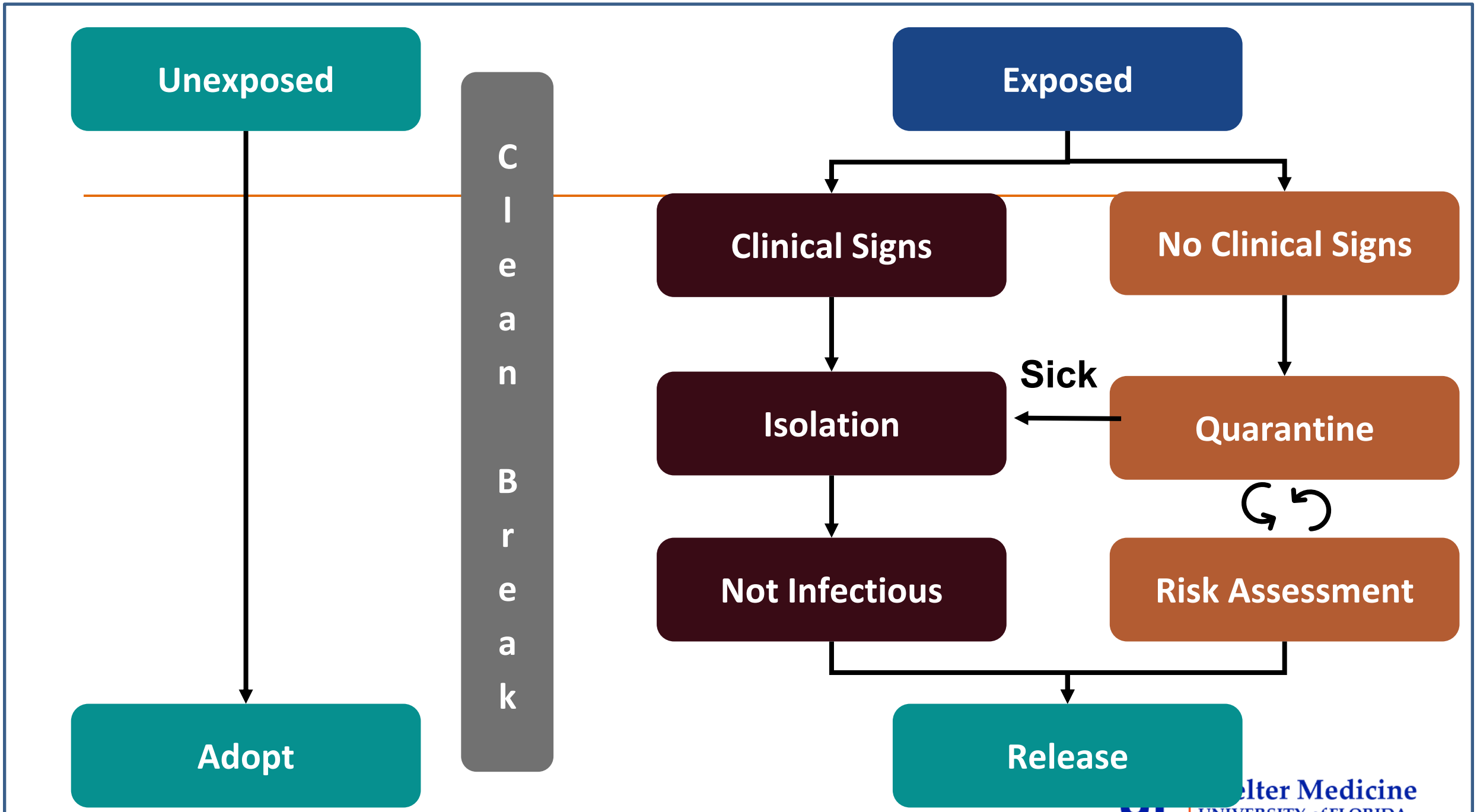
- Cough/purulent nasal discharge
  - Bleeding from nose
  - Rapid progression to respiratory distress with exaggerated inspiratory effort, grimacing, drawn lips
  - Death in hours

Clinical Disease in Cats

- Severe URI and pneumonia
  - No pulmonary hemorrhage
- Neuro signs
  - Painful neck/back
  - Ataxia
  - Recumbency
  - Seizures
- Postmortem
  - Fulminant necrotic pneumonia
  - Meningoencephalitis

Strep zoo Diagnosis

- Index of suspicion
  - Sudden death of dogs with hemorrhage from the nose/mouth
  - Dogs with respiratory distress and bleeding from nose
  - Cats with pneumonia ± neuro signs
- Must confirm clinical suspicion
  - Comprehensive respiratory PCR Panels: nasal/oropharyngeal swabs or fresh/frozen lung tissue
  - Bacterial culture/sensitivity: nasal culturettes or fresh/frozenlung tissue
  - Histopathology: lung tissue
- Once diagnosed in index cases, no need to test every exposed animal


Unexposed
Exposed
Clean Break
Clinical Signs
No Clinical Signs
Sick
Isolation
Quarantine
Not Infectious
Risk Assessment
Adopt
Release

Strep zoo Management

- Same strategy as for other contagious pathogens
  - Isolation of sick animals/diagnosed shedders
  - Quarantine of exposed asymptomatic animals
  - Create a clean break

- Twist: antibiotic treatment
  - Therapeutic for sick/confirmed infected animals
  - Prophylactic for exposed and at-risk animals due to potential for severe disease and death

Strep zoo Management

- Effective antibiotic choices
  - Resistant to doxycycline and most fluoroquinolones
  - Sensitive to penicillins and cephalosporins
  - Clavamox BID PO X 7 days
  - Cephalexin BID PO X 7 days [dogs only]

Not shelter-friendly

  - Simplicef (cefpodoxime) SID PO X 7days [dogs only] [$1.25 - $3.75 per dose]
  - Convenia (cefovecin) SQ once [$10 - $100 per dose]

Shelter-friendly

Strep zoo Management

- Isolation of sick/confirmed shedders
  - Ideally house in a separate room to stop bacterial exposure in the general population
  - PPE required (gown/gloves for cats and Tyvek/gloves/boots for dogs)
  - Can isolate in place with signage to remind staff to wear PPE
  - Start Simplicef or Convenia treatment
  - No leash-walks or playgroups for dogs for 3 days
  - Resume leash-walks after 3 days
  - Resume playgroups after 7 days
- Release from isolation after 7 days of antibiotic treatment
  - Adopted/transferred animals: release after day 3 with antibiotics (if on oral meds)

Strep zoo Management

- Quarantine of exposed animals
  - Considered an infectious risk
  - House in place
  - PPE required (gown/gloves for cats and Tyvek/gloves/boots for dogs)
  - Start Simplicef or Convenia prophylactic treatment
  - No leash-walks or playgroups for dogs for 3 days
  - Resume leash-walks after 3 days
  - Resume playgroups after 7 days
- Release from quarantine after 7 days of antibiotic treatment
  - Adopted/transferred animals: release after day 3 with antibiotics (if on oral meds)

Strep zoo Management

- Clean break to prevent exposure of more animals while sick/exposed animals are treated
- Private shelters: stop admissions for at least 3 days
- Municipal shelters: restrict intake to “must admits” for at least 3 days
  - House in a separate ward or kennel
  - No separate area available: start on antibiotic X 3 days if housed with exposed animals

Sanitation

- Successful management requires elimination of Strep zoo bacteria from environmental surfaces
- Removal of biofilms with Dawn dish detergent
  - Biofilms trap pathogens in body oils/organic debris
  - Biofilms shield pathogens from disinfectant
  - Biofilms can be a reservoir of infectious pathogens for new animals

Sanitation

- Best practice: daily scrubbing of enclosures with detergent followed by disinfectant application
  - Shelters that skipped the cleaning step have experienced recurrent Strep zoo
- Staff-friendly practice: weekly detergent cleaning step for occupied enclosures and between new animals

Wake County Animal Center

Wake County Animal Center pauses services due to canine illness

Wake.gov/news
February 6, 2025

In response to a recent outbreak of Streptococcus zooepidemicus, resulting in the deaths of 3 dogs, the Wake County Animal Center is taking proactive steps to ensure the health and safety of animals and the community.

The shelter will close beginning Friday, Feb. 7 for at least 30 days to help contain the outbreak. The center will stop accepting animals to prevent new cases and protect the total of 287 animals currently being cared for by Wake County.

Adoptions: Adoptions of all pets, including dogs, cats and other small animals, are being paused.

Surrenders: The Wake County Animal Center will NOT allow owners to surrender any animals during this closure. Stray animals from the public will not be accepted during this time.

Animal Control: Animal Control agencies will continue responding to emergency animal calls, however, they will not be picking up strays or owner surrenders in the field.

Bite Animals: The Animal Center often holds pets on quarantine following bite incidents, however, at this time, those animals will need to be quarantined instead at veterinary offices or in private homes.

Humane Society of the Pikes Peak Region

HSPPR limits dog intakes amid rising contagious Strep zoo cases

by: Norishka Pachot
Posted: Feb 20, 2025

(COLORADO SPRINGS) — Starting Thursday, Feb. 20, the Humane Society of the Pikes Peak Region (HSPPR) will temporarily limit dog intakes after several dogs tested positive for Strep zoo.

HSPPR said 4 dogs tested positive for Streptococcus zooepidemicus (Strep zoo), a type of bacteria that can affect dogs. The illness can spread easily through direct contact between dogs and contact with contaminated objects, like shoes or bowls.

HSPPR is taking cautionary methods and response measures such as:

- Proactive treatment: All 100 dogs at HSPPR are receiving prophylactic antibiotics.
- Deep cleaning: Staff are conducting thorough sanitation procedures to mitigate further spread.

Due to the illness, HSPPR will temporarily limit their dog intakes to emergency cases only for the next 7 days.

My Lessons Learned

- Strep zoo can be a deadly opportunistic pathogen for dogs and cats
- Crowding coupled with endemic respiratory illnesses are likely the most important risk factors for Strep zoo transmission
- Triggers for testing: 1) sudden death of dogs with hemorrhage from the nose and mouth, 2) dogs with dyspnea and rapid decompensation from pneumonia, 3) dogs with subtle bleeding from the nose, and 4) cats with severe respiratory signs with or without concomitant neurological signs.
- Management of Strep zoo infections employs the same strategy used for containment and resolution of other contagious diseases: isolation of sick/infected animals, quarantine of asymptomatic exposed animals, and creation of a clean break to prevent further exposures.
- The twist for Strep zoo is inclusion of therapeutic antibiotic treatment of sick animals and prophylactic antibiotic treatment for exposed animals. The most effective shelter-friendly antibiotics are Simplicef and Convenia
- Successful management requires sanitation practices that remove biofilms