Antibiotic Stewardship

Cynthia Karsten, DVM, DABVP (Shelter Medicine Practice)
Outreach Veterinarian
UC Davis Koret Shelter Medicine Program

KORET SHELTER MEDICINE PROGRAM

But first…

- Invest in high quality treatment ward and housing
  - Air, light, space, quiet, comfort
- Evaluate early and often
- Focus on LOS

And…

- Don’t necessarily move cats with mild URI
  - Mark cage in friendly way to indicate medical monitoring
  - Handle and clean last or biosecurity between
  - Move if more severe signs, stress, antibiotics
- Don’t hold chronically snotty cats forever waiting for signs to resolve
  - Foster care or adoption
  - Unlikely risk to other pets

Where did this come from…

- 1941 – dawn of the antibiotic era

Box 1: Selection of antibiotic resistance

Target selection—For certain "professional" pathogens, such as *Mycobacterium tuberculosis*, spontaneous resistance conferring mutants may be selected during treatment, can be transmitted before cure is achieved, or can re-emerge after treatment failure. Other professional pathogens where this may apply include HIV, malaria, gonorrhoea, and *Salmonella typhi*

Collateral selection—Many bacterial species that live harmlessly in the gut, on our skin and mucus membranes, or in the environment can also cause disease as opportunist pathogens. For such organisms, resistance selection occurs predominantly during antibiotic treatment of other infections. Resistance in opportunists may be passed easily to other strains of the same species of bacteria or to different species. Key examples include methicillin resistance in *Staphylococcus aureus*, extended spectrum β-lactamase producing *Enterobacteriaceae* and carbapenem resistance in *Klebsiella pneumoniae*

Today

- Patients are put at unnecessary risk from antibiotic resistance when treatment is given for longer than necessary, not when it is stopped early
- For common bacterial infections no evidence exists that stopping antibiotic treatment early increases a patient's risk of resistant infection
- Antibiotics are a precious and finite natural resource which should be conserved by tailoring treatment duration for individual patients
- Clinical trials are required to determine the most effective strategies for optimizing duration of antibiotic treatment

Main Points

- Don’t treat for set time period for routine URI
  - Monitor and discontinue when signs resolve
  - Exception for suspected Chlamydia or chronic URI

Main Points

- Don’t treat for set time period for routine URI
  - Monitor and discontinue when signs resolve
  - Exception for suspected Chlamydia or chronic URI
- Treat with the highest safe dose of the most effective antibiotic(s)

Journal of Veterinary Internal Medicine

ACVIM
American College of Veterinary Internal Medicine

Open Access

Guideline and Recommendation

J Vet Intern Med 2017;31:279–294

Antimicrobial use Guidelines for Treatment of Respiratory Tract Disease in Dogs and Cats: Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases

M.R. Lappin, J. Blondeau, D. Boothe, E.B. Breitschwerdt, L. Guardabassi, D.H. Lloyd, M.G. Papich, S.C. Rankin, J.E. Sykes, J. Turnidge, and J.S. Weese

Respiratory tract disease can be associated with primary or secondary bacterial infections in dogs and cats and is a common reason for use and potential misuse, improper use, and overuse of antimicrobials. There is a lack of comprehensive treatment guidelines such as those that are available for human medicine. Accordingly, the International Society for Companion Animal Infectious Diseases convened a Working Group of clinical microbiologists, pharmacologists, and internists to share experiences, examine scientific data, review clinical trials, and develop these guidelines to assist veterinarians in making antimicrobial treatment choices for use in the management of bacterial respiratory diseases in dogs and cats.

Key words: Bronchitis; Pneumonia; Pyothorax; Rhinitis.

Cats

The presence of purulent or mucopurulent nasal or ocular discharges might increase the suspicion that primary or secondary bacterial infection is present, but there is no definite proof of this association because viral or fungal agents can also induce mucopurulent discharges.

It is the opinion of the Working Group that there is limited benefit to performing cytology of nasal discharges to diagnose bacterial infection and guide the antimicrobial choice.

The Working Group recommends that antimicrobial treatment be considered within the 10-day observation period only if fever, lethargy, or anorexia is present concurrently with mucopurulent nasal discharge.

Dogs

The majority of cases of CIRDC are currently believed to be viral in etiology and so antimicrobial administration is often not indicated.

Co-infections with multiple respiratory pathogens are common in dogs with CIRDC and each of the agents can be harbored by dogs with no clinical signs.

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The Working Group recommends that antimicrobial treatment be considered within the 10-day observation period only if fever, lethargy, or Inappetence is present together with mucopurulent discharges.

What don't antibiotics treat?

Antibiotics do not work on viruses, such as colds and flu, or runny noses, even if the mucus is thick, yellow or green. Antibiotics also won't help some common bacterial infections including most cases of bronchitis, many sinus infections, and some ear infections.

P.s. still wash hands

- 60-80% ethanol or isopropyl alcohol or accelerated hydrogen peroxide wipes
- 20-30 seconds, all surfaces
- Within 3 feet of point of care
- Wash and dry hands after contact with sick animal or bodily fluids

Outbreak Management/Emerging Diseases

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(Shelter Medicine Practice)
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With special thanks to Drs. Sandra Newbury & Aleisha Swartz, UW Shelter Medicine

Is it an outbreak?

Sudden rise in incidence of disease

→Clinical signs persisting longer than usual despite normal treatment

→Some animals not clearing

→Unusual clinical signs

→Increased morbidity/mortality

→More concerns/complaints from new owners/community veterinarians

Outbreak Management Steps

1. Protect unexposed animals
2. Diagnose and isolate infected animals
3. Identify and manage exposed animals via risk assessment
4. Decontaminate
5. Communicate
6. Revise operations to prevent future outbreaks

Step zero: don’t hit the panic button!

Guidelines for Standards of Care in Animal Shelters

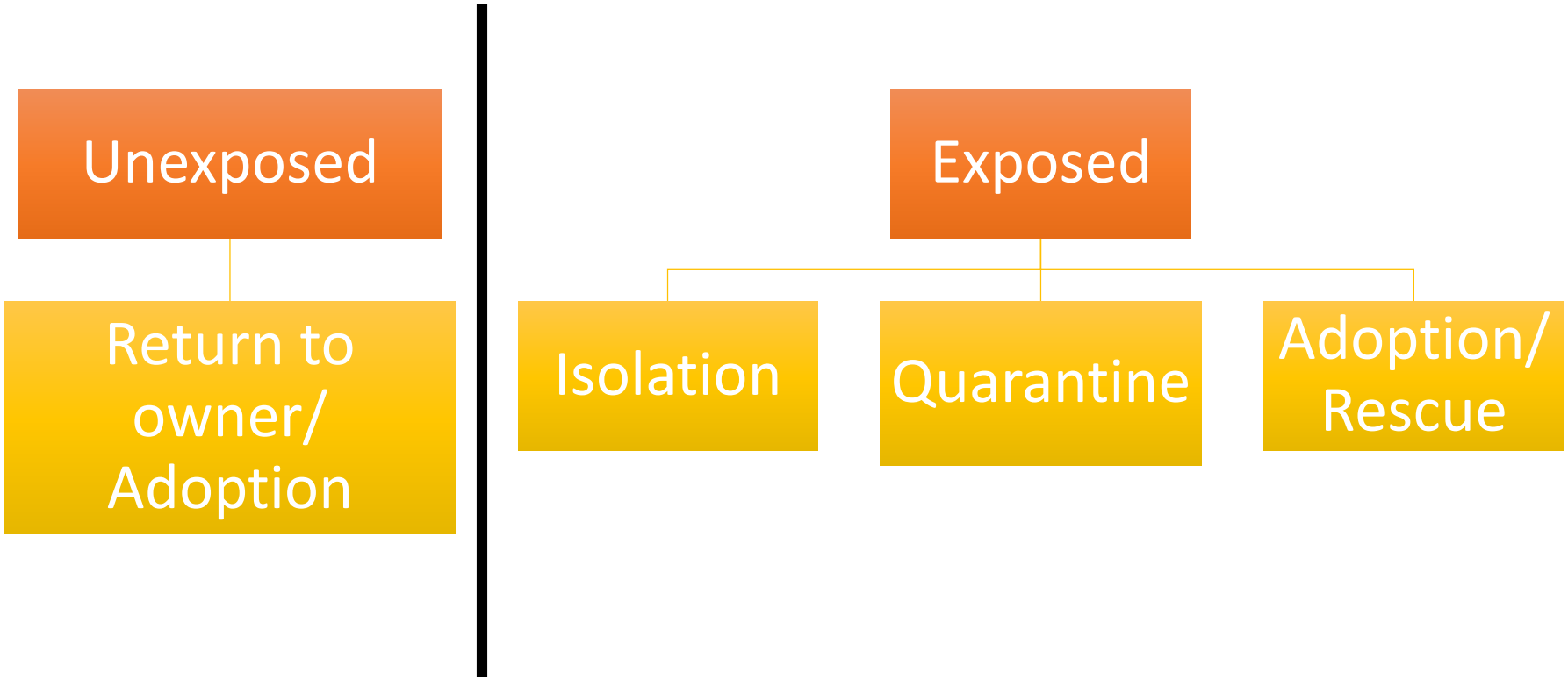
The Association of Shelter Veterinarians • 2010

“All other avenues must be fully examined and depopulation viewed as a last resort.”

1. Protect Unexposed: Create a clean break

- For animals not exposed & new incoming animals
- House in separate area away from exposed animals
- Divert intake as much as possible
- Do not take puppies/kittens
- Vaccinate on intake = MUST
- Includes people, animals, equipment

Clean Break


Unexposed
Return to owner/ Adoption
Exposed
Isolation
Quarantine
Adoption/ Rescue

2. Diagnose the pathogen

In-House: ELISA

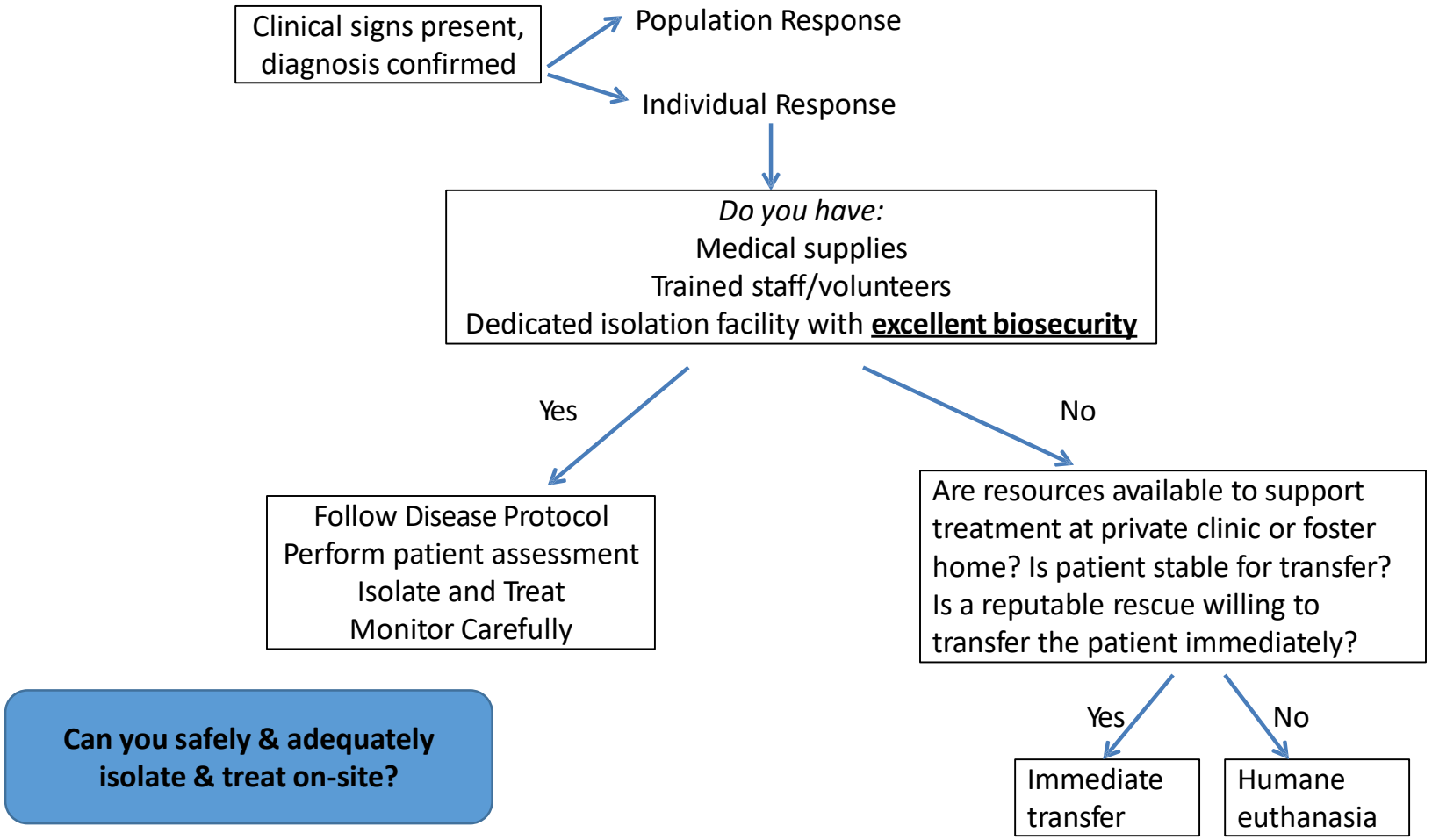
PCR

Considerations for Diagnostic Tests

- Accuracy?
  - Sensitivity/Specificity
  - Biology of pathogen/disease
  - Handling/technical factors
- Prevalence of disease and positive/negative predictive value
- Necropsy = gold standard

2. Isolate clinical animals

- ***Single most important step***
- Reduces transmission & infectious dose
- Is on-site isolation & biosecurity adequate?
  - If not, then consider off-site options


Clinical signs present, diagnosis confirmed
Population Response
Individual Response
Do you have:
Medical supplies
Trained staff/volunteers
Dedicated isolation facility with excellent biosecurity
Yes
No
Follow Disease Protocol
Perform patient assessment
Isolate and Treat
Monitor Carefully
Are resources available to support treatment at private clinic or foster home? Is patient stable for transfer? Is a reputable rescue willing to transfer the patient immediately?
Yes
No
Immediate transfer
Humane euthanasia
Can you safely & adequately isolate & treat on-site?

3. Manage Exposed Animals: Risk Assessment

Goal:

Assess risk of disease of individual animals to help guide population management decisions.

This will allow continued movement through the sheltering system to prevent crowding & maintain welfare.

Risk Factors

Animal risk

- Age of animal
- Likelihood of exposure
- Vaccine history – at intake or possibility of before?
- Diagnostic test results

Environmental risk

- Sanitation practices
- Vaccination practices
- Housing type/density
- Time to onset - facility acquired vs. community acquired disease
- Multiple areas of shelter involved

Risk Assessment

Very Low Risk

- Adult fully, vaccinated dogs (history and/or altered)

Low Risk

- Adults & puppies > 5 months old with vaccine 8 days prior to first case breaking

Moderate Risk

- Vaccinated puppies under 5 months of age

High Risk

- All unvaccinated puppies and dogs or those with vaccine < 8 days

Very High Risk

- Littermates of affected animals & clinical animals

Quarantine

- 2 weeks for parvoviruses
- 6 weeks for distemper
  - Impractical, inhumane within shelter
  - Strain on capacity for care (C4C)
  - Titer testing very useful
- Seek off-site quarantine
  - Full disclosure

4. Decontaminate

Cleaning

↓

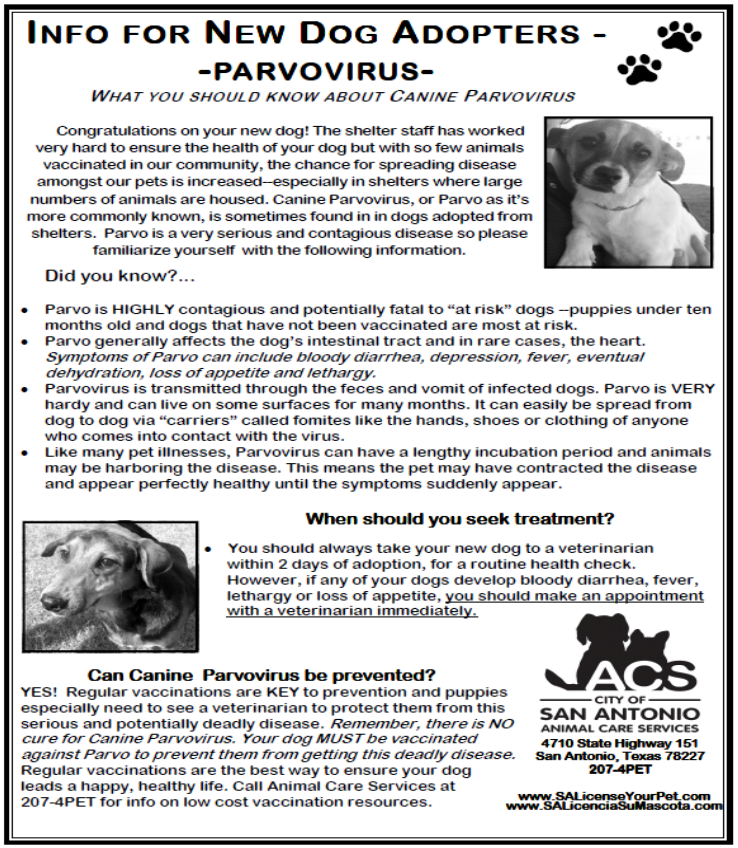
Disinfection

↓

<u>Decontamination</u>

5. Communicate

- Staff
- Donors
- Volunteers
- Fosters
- Community
- Local Clinics
- Other local rescues/shelters



INFO FOR NEW DOG ADOPTERS - -PARVOVIRUS-

WHAT YOU SHOULD KNOW ABOUT CANINE PARVOVIRUS

Congratulations on your new dog! The shelter staff has worked very hard to ensure the health of your dog but with so few animals vaccinated in our community, the chance for spreading disease amongst our pets is increased--especially in shelters where large numbers of animals are housed. Canine Parvovirus, or Parvo as it's more commonly known, is sometimes found in in dogs adopted from shelters. Parvo is a very serious and contagious disease so please familiarize yourself with the following information.

Did you know?...

- Parvo is HIGHLY contagious and potentially fatal to "at risk" dogs –puppies under ten months old and dogs that have not been vaccinated are most at risk.
- Parvo generally affects the dog's intestinal tract and in rare cases, the heart. *Symptoms of Parvo can include bloody diarrhea, depression, fever, eventual dehydration, loss of appetite and lethargy.*
- Parvovirus is transmitted through the feces and vomit of infected dogs. Parvo is VERY hardy and can live on some surfaces for many months. It can easily be spread from dog to dog via "carriers" called fomites like the hands, shoes or clothing of anyone who comes into contact with the virus.
- Like many pet illnesses, Parvovirus can have a lengthy incubation period and animals may be harboring the disease. This means the pet may have contracted the disease and appear perfectly healthy until the symptoms suddenly appear.

When should you seek treatment?

- You should always take your new dog to a veterinarian within 2 days of adoption, for a routine health check. However, if any of your dogs develop bloody diarrhea, fever, lethargy or loss of appetite, you should make an appointment with a veterinarian immediately.

Can Canine Parvovirus be prevented?

YES! Regular vaccinations are KEY to prevention and puppies especially need to see a veterinarian to protect them from this serious and potentially deadly disease. *Remember, there is NO cure for Canine Parvovirus. Your dog MUST be vaccinated against Parvo to prevent them from getting this deadly disease.* Regular vaccinations are the best way to ensure your dog leads a happy, healthy life. Call Animal Care Services at 207-4PET for info on low cost vaccination resources.

ACS
CITY OF SAN ANTONIO
ANIMAL CARE SERVICES
4710 State Highway 151
San Antonio, Texas 78227
207-4PET

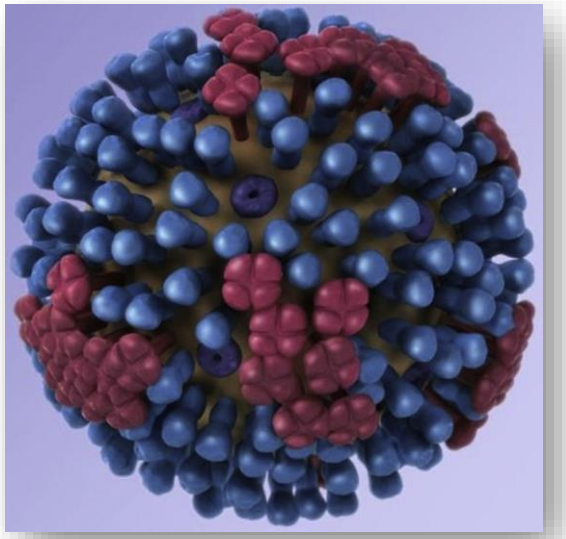
www.SALicenseYourPet.com
www.SALicenciaSuMascota.com

6. Revise Operations to Prevent Future Outbreaks

- Population Management
  - Prevent crowding
  - Effective flow of population/minimal LOS
- Biosecurity
  - Vaccination practices
  - Sanitation practices
  - Disease recognition
- Housing
  - Double compartment!!
- Protocols

Canine Influenza Virus

- Not very stable in the environment
  - Inactivated w/in a few minutes to hours (unless dark, damp conditions)
  - Inactivated by hot water and detergent
- Transmitted by respiratory route
  - Direct contact is generally required to allow transmission to a susceptible recipient
  - Also suspect fomites based on experience
- H3N2 was first introduced into the United States in Chicago in February 2015…



Clinical Signs

Mid- March to April 2015

- Outbreak of respiratory disease in Chicago
- First cases identified in dogs living in homes
  - Not in shelters
- Risk factors:
  - Training classes
  - Visit to vet clinics
  - Doggy daycare
  - Boarding facilities
  - Elevator apartment buildings?
- Shelter's initially unaffected
- Canine influenza was negative on initial respiratory panels…

And then…

- By April – CVMA confirms CIV positives
- Influenza Type A PCR, typing
- H3N2 identified - not H3N8
  - Novel virus in the US
  - Geographically limited to the Chicago Area
- Similar clinical signs to H3N8
  - Some suggestion of differences in course of disease
  - Feline susceptibility?

"Although rumors have circulated that the virus was introduced to the U.S. through dogs rescued and imported from Asia, there is no evidence to confirm these rumors." – AVMA website

Identification

- Mild to moderate respiratory disease
- Unusual presentation
  - Wave like introduction within shelters
    - Case numbers grow rapidly in 2-4 days
  - Change in quality and quantity of illness
  - Honking cough
  - Some progression to pneumonia
  - Low mortality
- PCR testing to confirm
  - Broad based influenza A

Testing

- Influenza Type A rRT-PCR, typing
- Initially Cornell and Wisconsin, now IDEXX
- Shallow nasal swab has been sufficient
- VTM or saline in tube with swab
- Ideally, no cotton or wood
- Careful of cross contamination of samples
- Change gloves between each animal
- Screening for other pathogens

Timing for sampling

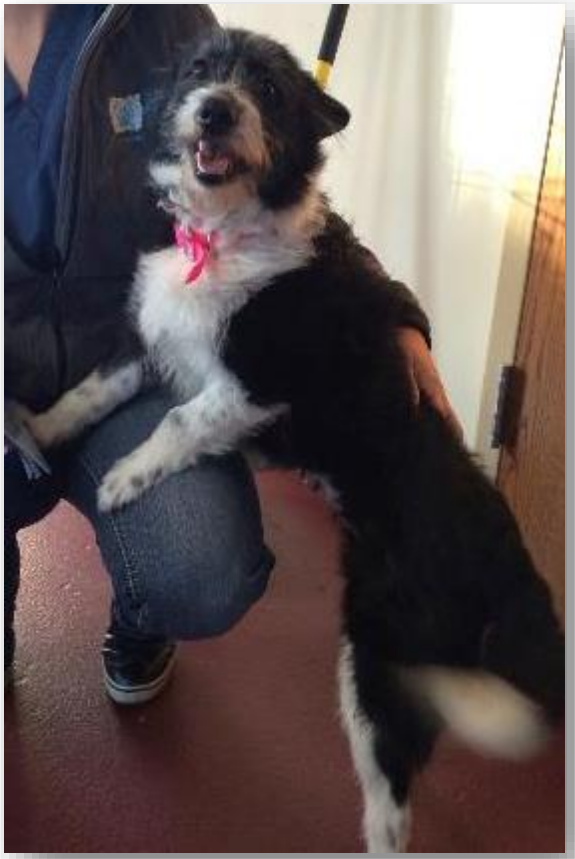
- Many H3N2 positives for at least 14-15 days duration
- Weak positives both early and late clinical signs
- Some intermittent shedding
  - positive / negative / positive

Shelter #1						
Days since 1st positive	1	13	14	15	17	19
Carla	20.8	39.3	NEG	NEG	NEG	NEG
Cooper	34.7	38.1	NEG	NEG	NEG	NEG
Fendi	NEG	31.8	32.1	36.2	37.2	
Jazz	29.1	35.1	NEG	37.1	NEG	38.2
Marschino	NEG	33.9	32	NEG	NEG	
Mattie	16.7	31.4	35.3	39.1	31.1	NEG
Pirate	19	31.9	35.4	NEG	NEG	NEG
Regulus	34.5	NEG	38.1	NEG	NEG	NEG
Roland	25.2	29.6	32.3	38.5	NEG	NEG
RuPaul	25.1	37.3	NEG	NEG	NEG	NEG

Shelter #2 and #3						
Days since 1st positive	1	5	6	10	11	15
127770	NEG		24.2	36.2		
127769	37.4		23.7	39.5		
127708	25.1	22.7				38.6*
128333	37.9	24.6				35.9
127177	26				37.1	38.2*
Mackenzie	29.5					36

Shelter Risk Factors

- Early on:
  - Shared space with public vet clinic
  - Training center shared with the public
- Later on:
  - Bringing in dogs
- Ongoing:
  - Lack of isolation space
  - Low staffing / resources
  - Increased intake
  - Population density



Tidal Wave

“Hello,

We've been hit hard here these last couple days. It broke on Wednesday, with only approximately 5 dogs needing to be isolated and treated. By Thursday morning at 8am, I had to quarantine an entire ward (approximately 30 dogs). All are exhibiting signs including the dry honking cough. All dogs are stable, but it has spread to the remainder of our canine population (totaling about 55 dogs).”

Challenges

- Powerful impact on shelters
- High (total) susceptibility
  - Prevention is difficult
  - Management is difficult
- Scale of treatment needs
- Novel virus
  - Responsible releasing?
- Brining it to an end?


Olympia
WASHINGTON
Salem
OREGON
MONTANA
IDAHO
WYOMING
Cheyenne
NORTH DAKOTA
Bismarck
SOUTH DAKOTA
Pierre
NEBRASKA
Lincoln
MINNESOTA
St. Paul
IOWA
Des Moines
Lake Superior
WISCONSIN
Lake Michigan
Madison
ILLINOIS
Springfield
MICHIGAN
Lansing
Lake Huron
Lake Erie
Lake Ontario
INDIANA
OHIO
Columbus
Frankfort
KENTUCKY
Jefferson City
MISSOURI
Topeka
KANSAS
Denver
COLORADO
Salt Lake City
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Wyoming
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San Francisco
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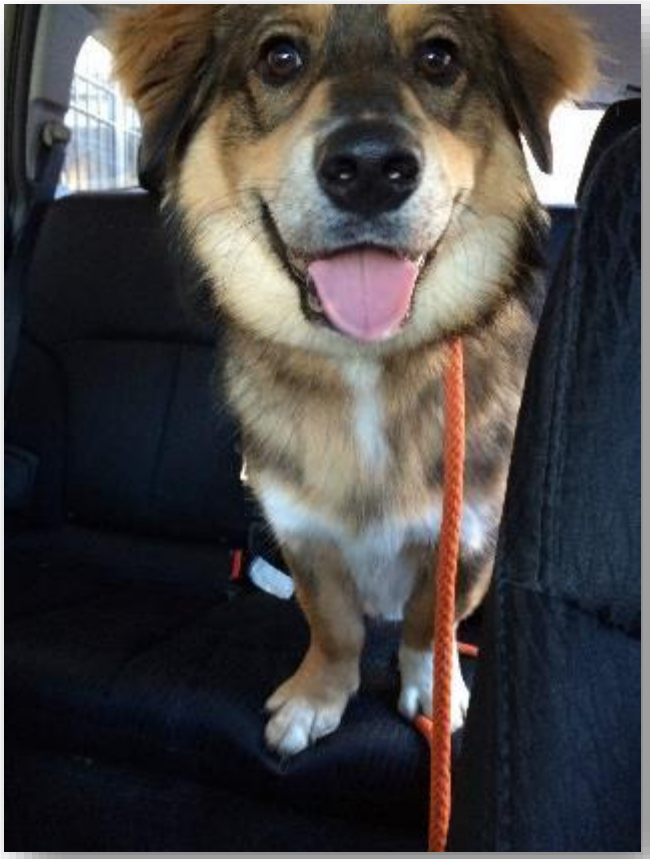
Fremont
San Jose
Fresno
Las Vegas
Bakersfield
Henderson
Arizona
Riverside
Los Angeles
New Mex.
Long Beach
Santa Ana
Anaheim
Phoenix
Irvine
San Diego
Chandler
Mesa
Chula Vista
Tucson
Mexico

Live Release Recommendations

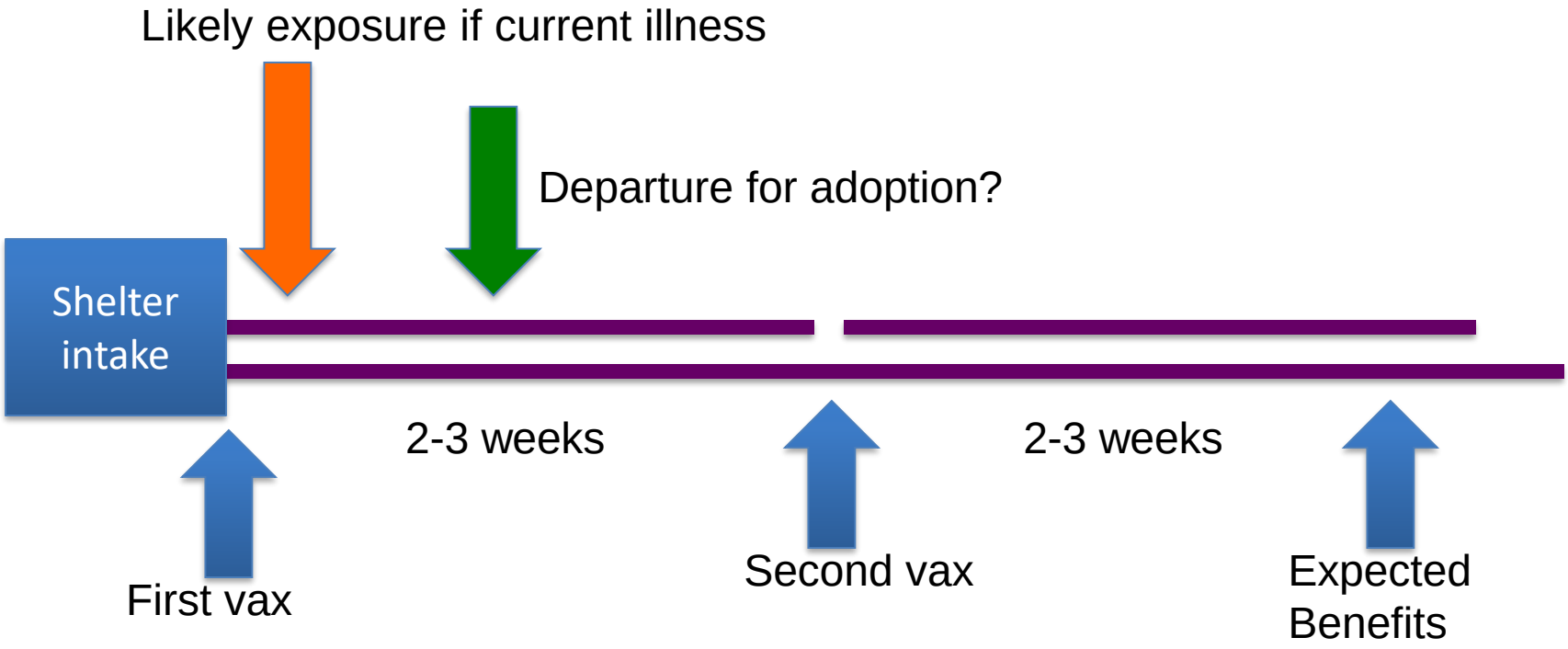
- Clinically healthy / exposed from affected facility
  - Ok to release from shelter
  - Quarantine / separate for 7 days
- Clinically ill from affected area / organization
  - Ok to release from shelter
  - Isolate for at least 21 days
  - Ensure adequate resources for care
- Do not travel to unaffected areas until after the waiting period



Adverse effects

- Animal health and well-being
- Slowed / stopped live release
- Huge treatment and testing expenses
- Cancelled fundraisers
- Cancelled community outreach
- Transfers-in rerouted
- Staff stress / worry
- Staff animal exposure

Graphic to show time to onset of immunity



Not worth the resource investment for most shelters

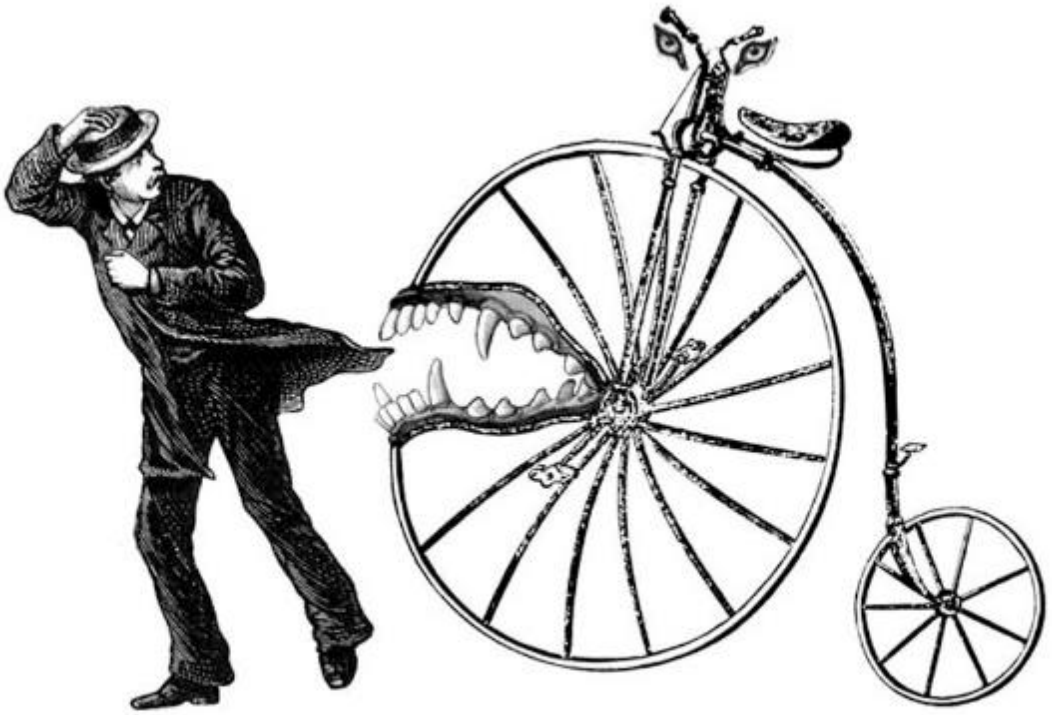
Environmental Management

- Most common disinfectants will kill flu virus on surfaces
- Relatively short lived. Reportedly:
  - 48 hours on surfaces and
  - 24 hours on fabric
  - 12 hours on hands
- Infected / shedding dogs are the greatest risk

Treatment

- Supportive care
- Nutritional support and hydration
- Broad spectrum antibiotic treatment to prevent or treat secondary infections
- Monitor for progression to pneumonia
- Work with a veterinarian to develop a treatment protocol
- Work with a veterinarian to develop treatment plans for individual animals with specific care needs or who are not responding to treatment

Strategies to stop the cycle



Questions?

clkarsten@ucdavis.edu