What Animal Shelters Need to Know About the Canine Influenza Outbreak

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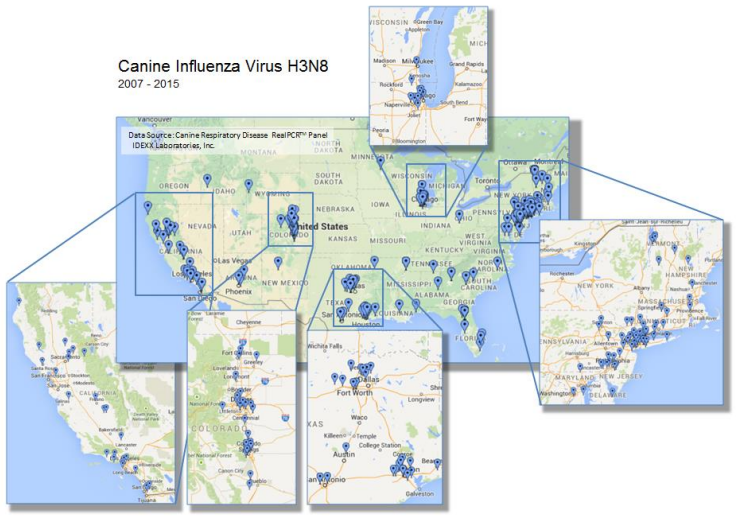
Thanks!

- To the Wisconsin Veterinary Diagnostic Lab, especially Drs. Kathy Kurth and Keith Poulsen for going above and beyond with diagnostic testing for our shelters.
- To Maddie's Fund who responded incredibly quickly to our request for help as we realized shelters needed more diagnostic information about what was happening.
- To all the Chicago shelters and rescues for being open with information and supporting each other to manage the illness, collect information, and find answers
- To Merck and Idexx for sharing information to help everyone manage the outbreak and provide care for individual dogs

Canine Influenza: Background

- **H3N8**
  - 2004-2005 Entire genome transferred from horses to canines
  - Canine specific virus
- **H3N2**
  - 2006-2007 Emergence in Korea, China, Thailand
  - Transfer from avian influenza likely
- Longer shedding period reported in "immune compromised" research animals
- Reports from Korea of infection, clinical signs and mortality in cats

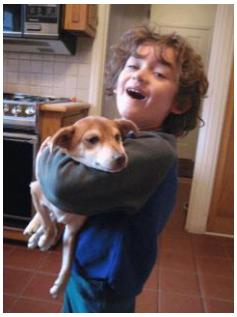


CIV H3N8 Data Information

- Much of the work that has been done to gain information about H3N8 canine influenza was done by Dr. Cynda Crawford at University of Florida

- Data points generated with real-time PCR, standardized & modular MDx platform
- IDEXX CRD panel includes 11 infectious agents & 7 quality controls
- Yearly CIV frequency 1-4%
- Frequency has declined over the past 4 years
- Chicago CIV cluster in 2008, single positives in the past 6 years
- Other clusters in Southern California, Texas and New York

No evidence of zoonosis



- Neither of the current strains of canine influenza have been shown to affect humans

What's going on now?

- 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?
- Canine influenza was negative on some initial respiratory panels

Canine influenza

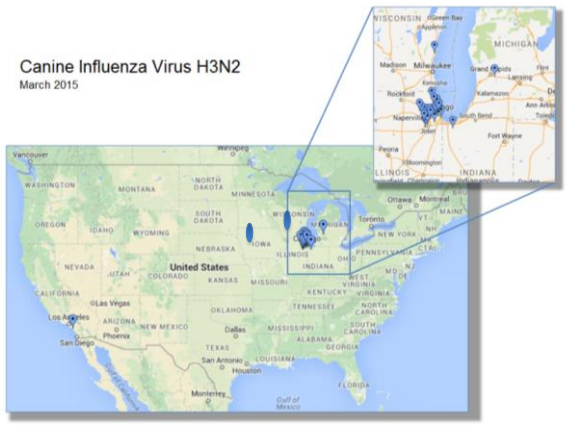
- H3N2 not H3N8
- Influenza Type A pcr, typing
- Cornell and Wisconsin
- Korean Origin
- Similar clinical signs to H3N8
  - 2015 Chicago – genetically almost identical to Asian strain
  - "Although rumors have circulated that the virus was introduced to the U.S. through dogs rescued and imported from Asia, there is no evidence to confirm these rumors." – AVMA website

H3N2 in Chicago

- Novel virus in the US
- Initial spread within identified risk categories in private homes
- Some shelters affected much earlier than others
- Wave like introduction within shelters
- Honking cough
- Mild to moderate respiratory disease
  - Some progression to pneumonia
  - Only a handful have died from clinical signs
- No cats affected clinically so far
- Longer shedding period than H3N8 in shelters

Collaborative Assistance and Research

- Merck / Cornell Partnership with veterinarians
- Zoetis presentations for the community
- WVDL / UW Shelter Medicine partners with shelters
- Idexx retests all samples and introduces test to detect new strain



CIV H3N2 Data Information

- **Idexx** submissions from March 2015 were re-tested with H3N2 real-time PCR in a retrospective study
- A total of 884 swabs were tested of which 63 or 7.1% tested positive for H3N2
- Cases were from the following geographic areas:
  Illinois, Chicago area (n=59)
  n =1 Indiana, Michigan, Wisconsin, California
- The earliest H3N2 positive case Idexx detected was March 12th in the Chicago area
- **MERCK / Cornell** collected over 200 positive samples from the Chicago Area-all typed have been H3N2
- **UW Shelter Medicine and Wisconsin Veterinary Diagnostic lab** collected almost 300 samples from shelters starting 4/3/15. Over 175 positives, all typed have been H3N2
- None of the exposed cats who have been sampled have had positives on PCR

So what's the big deal?

- Powerful impact on shelters
- Very difficult to prevent
- Difficult to manage in a population
- Scale of treatment needs
- Novel virus - Responsible releasing?

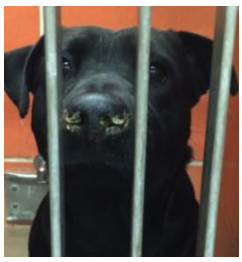
- Brining it to an end?

Shelters working as partners

- Anticruelty Society
- PAWS Chicago
- South Suburban Humane Society
- Animal Welfare League – Chicago Ridge
- Chicago Animal Care and Control
- PAWS Tinley
- Animal Welfare League – Intake Center
- Others?
- Rescue groups

Adverse effects

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



Amazing!

- Collaborative planning – stray transfers
- So far – all shelters involved are reporting they have been able to manage the outbreak without an increase in euthanasia
- Chicago Animal Care and Control is maintaining a 35% reduction in canine euthanasia compared to the same time period in 2015
- Continued transfer rescue support

Shelter Risk Factors

- Early on:
  - Shared space with vet clinic
  - Training center shared with the public
- Later on:
  - Bringing in dogs

Identification

- Respiratory disease
- Unusual presentation in individuals
- Unusual presentation in the population
- Pattern of spread like a tidal wave
- Case numbers grow rapidly in 2-4 days
- rtPCR testing to confirm

Monitoring / Surveillance

- Testing for newly sick animals
- "Nothing is sticking out in terms of respiratory disease." 4/22/15

4/3/15	4/8/15	4/17/15
NEG		
	NEG	
	NEG	
	NEG	
		NEG
		NEG
		NEG
		NEG
		NEG
		NEG
		NEG
		NEG
		NEG
		NEG
		WEAK POS
		NEG

Weak positive - early in infection

"It is the only weak positive we have had out of all the samples I've submitted and she was newly sick so I'm a little skeptical but we'll see if there are more now with this round of sampling."

"It's possible that CIV was weakly introduced but if that's true I would expect we would have had more positives. We have had almost every dog positive from other shelters affected."

"I hope that one weak positive may be some sort of artifact since all the other dogs are negative but please be aware that it may be that dog was infected."

"We will re-run it to check for lab contamination."

"It was still positive the second time they ran it."

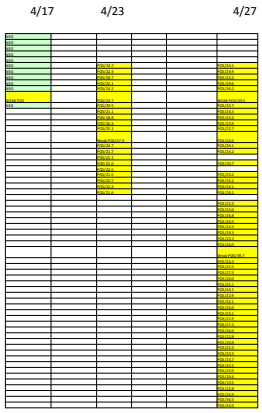
Index case?

4/17/15		4/23/15
NEG		
NEG		
NEG		
NEG		
NEG		
NEG		POS/19.7
NEG		POS/22.3
NEG		POS/30.7
NEG		POS/25.1
NEG		POS/24.2
WEAK POS		POS/23.7
NEG		POS/29.5
		POS/21.1
		POS/18.8
		POS/20.4
		POS/25.1
		Weak POS/37.9
		POS/24.7
		POS/21.7
		POS/21.1
		POS/21.0
		POS/22.5
		POS/21.0
		POS/20.7
		POS/22.4
		POS/21.6

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

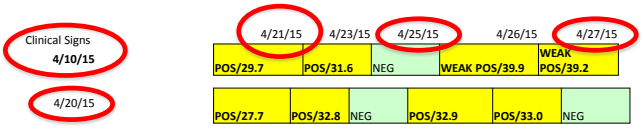
- Information still under development
- Onsite veterinary care
- Private vets don't want sick dogs sent to their clinics
- Treatment / diagnostic costs
- Maintaining quality of care

- Intake pressure

Confounding factors

- Ongoing "other" respiratory disease
- Clinical signs overlap

- Complicates management and control
- Muddies the time frame for influenza



Shedding

4/18/15	4/21/15	4/23/15	4/25/15	4/26/15	4/27/15	4/29/15	4/30/15
POS/25.2							POS/29.6
POS/25.1							WEAK POS/37.3
NEG							POS/31.8
POS/34.5							NEG
POS/19							POS/31.9
POS/16.7							POS/31.4
POS/29.1							POS/35.1
NEG							POS/33.9
POS/34.7							Weak POS/38.1
POS/20.8							Weak POS/39.3

- Viral load counts tend to drop over course of illness

Shedding – New Information

Day 1	Day 2	Day 3
Signs begin in shelter	20 affected	50

Day 1	Day 13	Day 16	Day 17	Day 18
POS/25.2	POS/29.6	WEAK POS/38.5	WEAK POS/32.3	NEG
POS/25.1	WEAK POS/37.3	NEG	NEG	NEG
NEG	POS/31.8	POS / 36.2	POS/32.1	WEAK POS/37.2
POS/34.5	NEG	NEG	WEAK POS /38.1	NEG
POS/19	POS/31.9	NEG	POS/35.4	NEG
POS/16.7	POS/31.4	WEAK POS	POS/35.3	POS/31.1
POS/29.1	POS/35.1	WEAK POS/37.1	NEG	NEG
NEG	POS/33.9	NEG	POS/32	NEG
POS/34.7	Weak POS/38.1	NEG	NEG	NEG
POS/20.8	Weak POS/39.3	NEG	NEG	NEG

- Viral shedding shown to continue for at least 18 days
- **21 day isolation / separation period currently recommended**
- **Two negative tests if shorter**
- Currently testing for viability

Testing

- Influenza Type A pcr, typing
- Initially Cornell and Wisconsin
- Shallow nasal swab has been sufficient
- WVDL has preferred VTM or saline in tube with swab
- Careful of cross contamination of samples
- Change gloves between each animal
- Screening for other pathogens

Timing for sampling

- Usually for flu, best early in the course of disease
- H3N2 positives for at least 12-13 days duration
- Weak positives both early and late clinical signs
- Some positive / negative / positive

4/18/15	4/30/15
POS/25.2	POS/29.6
POS/25.1	WEAK POS/37.3
NEG	POS/31.8
POS/34.5	NEG
POS/19	POS/31.9
POS/16.7	POS/31.4
POS/29.1	POS/35.1
NEG	POS/33.9
POS/34.7	Weak POS/38.1
POS/20.8	Weak POS/39.3

4/21/15	4/23/15	4/25/15	4/26/15	4/27/15	4/29/15
POS/21.2	**POS/23.4**	**POS/36.8**	NEG	**POS/31.8**	NEG
NEG					
POS/27.7	**POS/32.8**	NEG	**POS/32.9**	**POS/33.0**	NEG
POS/29.7	**POS/31.6**	NEG	**WEAK POS/39.9**	**WEAK POS/39.2**	NEG

Prevention

- Very difficult in the face of shelter introduction
- Monitoring
- Early identification
- Isolation**
- Responsible animal movement
- Short LOS in shelter care*
- Prevent introduction if possible

Live Release Adoption / Rescue 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 14 days
  - Ensure adequate resources for care
- Do not travel to unaffected areas until after the waiting period

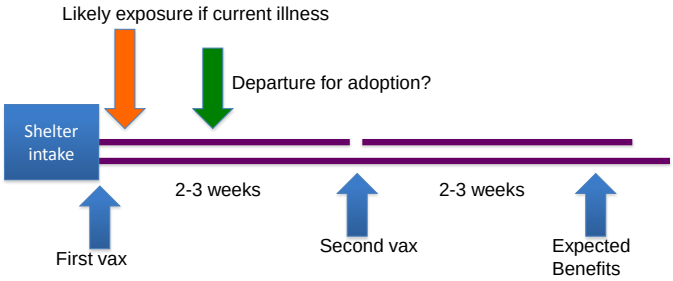
Information is prevention!

- Provide very clear information to anyone accepting animals from affected organizations

Vaccination?

- 2 Vaccines available
- Both are killed H3N8
- Merck Novibac –First licensed vaccine
  - 6 weeks and up
  - 2 doses 2-4 weeks apart
- Zoetis Vanguard – H3N8
  - 8 weeks and up
  - 2 doses 3 weeks apart
- Both have been shown to reduce clinical signs and reduce viral shedding for H3N8 infections
- Unclear if they would be protective for the H3N2 strain
- Time to onset makes these less helpful in a shelter setting

Graphic to show time to onset

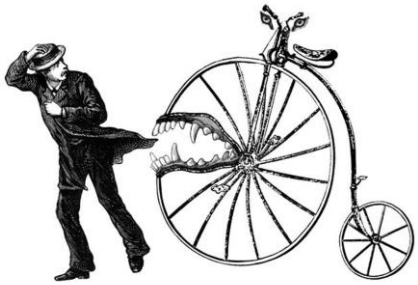


- Probably not worth the resource investment for most shelters

Environmental Management

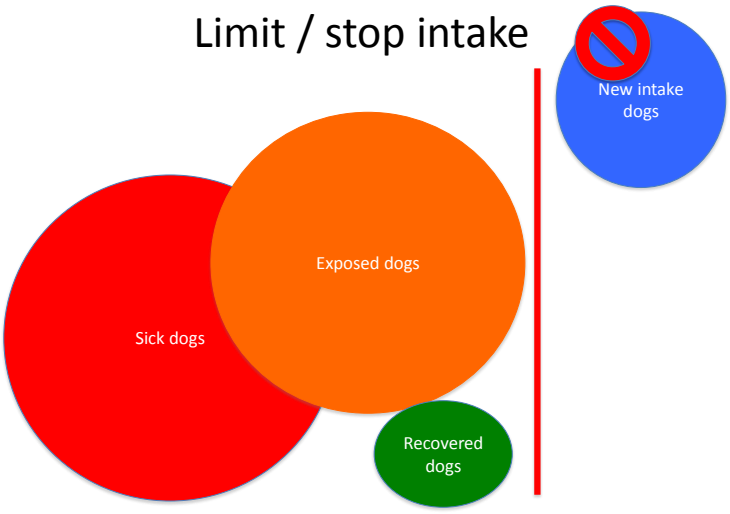
- Most common shelter disinfectants will kill flu virus on surfaces
- Relatively short lived. Reportedly:
  - 48 hours on surfaces and
  - 24 hours on fabric
  - 12 hours on hands

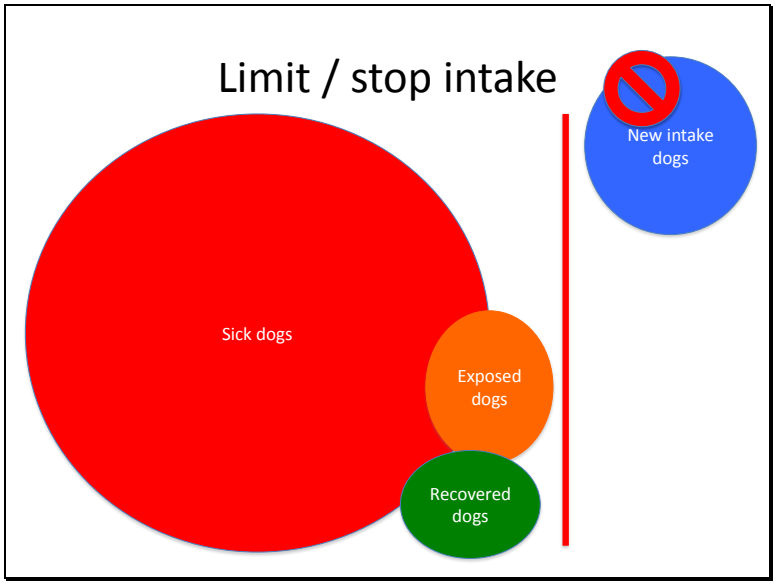
Strategies to stop the cycle

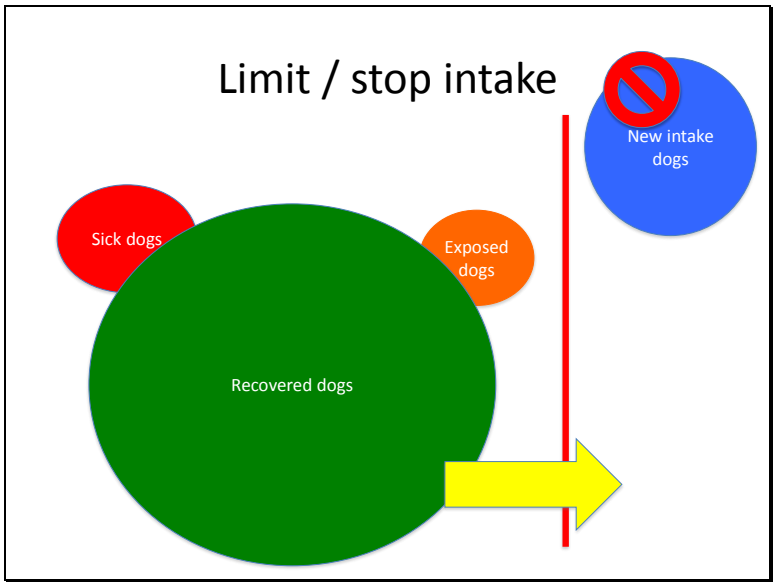


A VICIOUS CYCLE

Limit / stop intake




Limit / stop intake
New intake dogs
Sick dogs
Exposed dogs
Recovered dogs


Limit / stop intake
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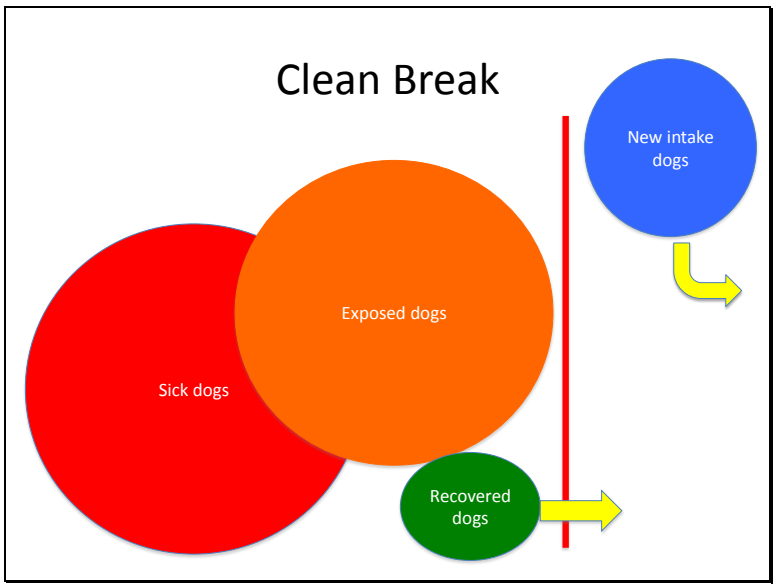
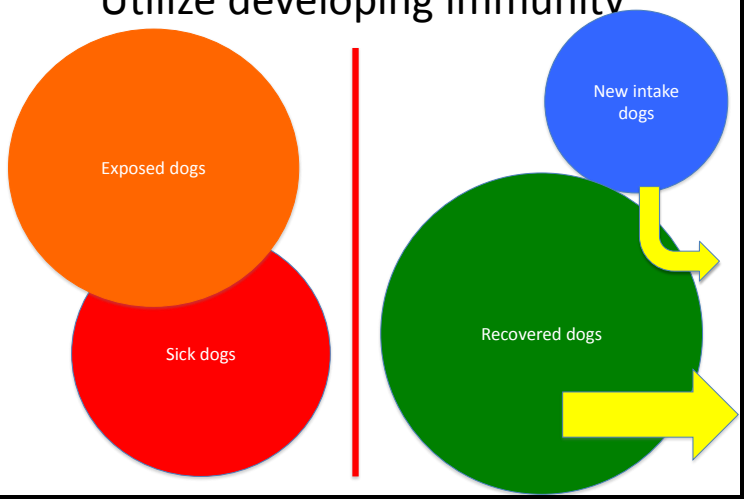

Clean Break
New intake dogs
Exposed dogs
Sick dogs
Recovered dogs

Utilize developing immunity

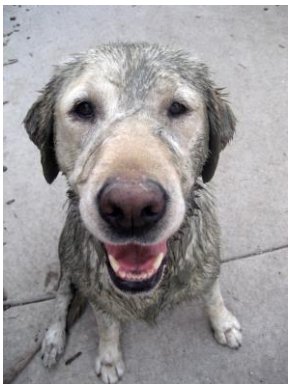


Treatment

- 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

Need help?

Please contact us:
uwsheltermedicine@vetmed.wisc.edu



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