


Transmission


- Highly contagious!
- Routes of infection
 - **Direct**
 - Aerosol
 - Fomite
- Environment (less likely)
 - No Zoonosis

Direct, most common



- How do you define direct?
- Co-housing
- Improperly used housing, guillotine doors down
- Tie outs for cleaning
- Yards during cleaning
- Admitting areas
- Play groups?

 **Aerosol Transmission**




- Up to 20 feet distance*

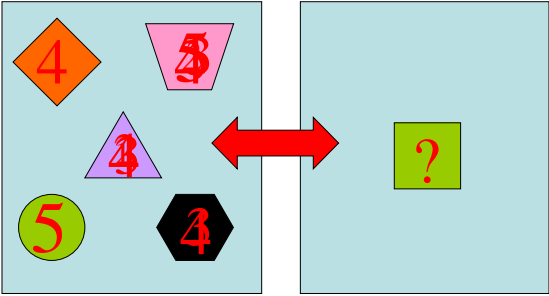
*Max Appel, Cornell University, 2006

 **Fomite over short distances**




- Staff and volunteer handling

 **Environment: Co-mingling “Reservoir Dogs”**



Shedding



- Inapparent or sub-clinical shedding possible in exposed dogs
- Post-recovery shedding Usually less than 4-6 weeks

The Furminator

Long-term PCR positives


- Rare but real issue
- Many months past recovery
- Does PCR positive = viral shedding?
- Infectious potential is unknown, but thought to be low

Susceptibility?


Intake Group	CDV SN	CPV HI
A671770	4	<20
A671780	256	1280
A671809	8	5120
A671868	4	<20
A671872	256	1280
A671928	2	5120
A671950	2	<20
A67200	4	1024
A672007	2048	20480
A672012	<2	5120
A672029	2048	20480


- Many dogs are susceptible on intake
- Varies by community
- Primarily serologic response
- Puppies under 16 – 20 weeks of age assumed to be susceptible
- Maternal Antibodies

7/11 (64%) susceptible to CDV




Which dog is susceptible?







Vaccination




- Key to prevention
- Almost a magic bullet!
- But not quite.




Vaccine handling!!




- Mix just before use
- Don't allow to sit even at room temperature
- Most important for CDV
- Drawback of having a virus that is easy to kill



Time to Onset of Immunity




- Sterile Immunity for most adults and susceptible pups in 3-5 days
 - (if they are not exposed before then)



We've known this for a while

- Twenty-one susceptible puppies in 10 litters were vaccinated with a single dose of combined canine distemper-infectious canine hepatitis modified live virus tissue culture vaccine, Tissuvax-DH (Pitman-Moore Division of the The Dow Chemical Company), simultaneously with introduction into a canine distemper contaminated environment. One of 21 vaccinated puppies and 14 of 16 nonvaccinated littermates died of a canine distemper infection.


Schroeder, J. P., D. W. Bordt, et al. (1967). "Studies of canine distemper immunization of puppies in a canine distemper-contaminated environment." *Vet Med Small Anim Clin* 62(8): 782-7.



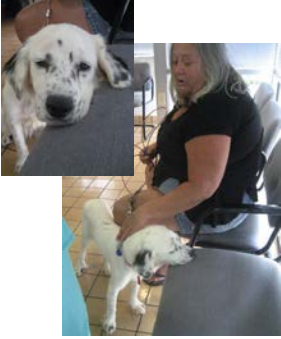
Onset of immunity?

- "In my study at the University of Wisconsin, designed to mimic an animal shelter environment, I wanted to find the answer to the question "Will puppies vaccinated with 1 dose of Recombitek C6 four hours before being placed in a room with dogs shedding virulent CDV virus be protected?"


RD Schultz, University of Wisconsin




Response




- “Clean Break”
- Please don’t do nothing



PLEASE, Don’t go this alone




- Veterinary assistance is essential to response implementation
- Maximize life saving
- Minimize resource investment




Communication!

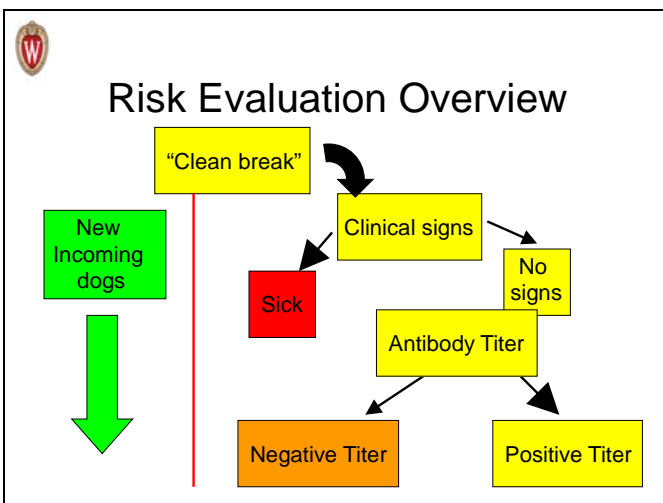
- Communicate early and often
- Ask for help
- Explain the life saving work you’ re doing


 **Understanding Risk Assessment and Immunity**

- Risk group designation
 - Based on controlled challenge studies in dogs with known active immunity
- Active immunity vs. Passive immunity


 **Risk group evaluation and “Clean Break”**

- General principles:
 - ✓ Stop the cycle of transmission
 - ✓ Send low risk dogs on their way
 - ✓ Isolate or separate sick dogs
 - ✓ Identify susceptible dogs





Start: Get Ready



- Vaccinate ON INTAKE or sooner!
- Repeat at two-week intervals if puppies stay that long
- Get them out sooner
- Evaluate potential for adoption
- Consider every dog in current population
- Evaluate capacity



Step one: “CLEAN BREAK”




- New, incoming dogs must be separated from exposed dogs
- Clean and disinfect the area first
- Evaluate expected intake
- Plan any co-mingling
- Clean and care for new arrivals first
- Separate staff if possible




Step Two: Evaluate Clinical Signs




- Carefully evaluate each dog
- ANY suspect clinical signs = High Risk
 - Respiratory disease
 - Unexplained GI disease
 - “ADR”
 - PCR testing?
- Assessment by veterinarian to rule out clinical signs



Step Three: Antibody titers




- High Risk and Low Risk groups
- Can't evaluate dogs with clinical signs*
- Evaluating pups
- In House testing
 - Faster
 - Positive / Negative
- Diagnostic Lab testing
 - More quantifiable
 - Longer turn around
 - Needs to validated against challenge data



In house kits


- Canine VacciCheck
- Synbiotics TiterCheck
- Carefully follow instructions
- Experienced technicians
- Tests validated by VN
- Cost = approx. \$20 / dog tested




Antibody TEST Interpretation


Age	CPV	CDV	KC	Risk Category
7yr Old	+	+	N	Low
1yr Old	+	+	N	Low
5yr Old	+	+	N	Low
Old 11mo	+	-	N	High
1yr Old	+	+	N	Low
5yr 1 mo	+	+	N	Low
4yr Old	+	+	N	Low
Old 5mo	+	+	N	Low
Old 8mo	+	+	N	Low
1yr 7mo	+	+	N	Low
1yr 8mo	+	+	N	Low
Old 3mo	-	+	N	Low
Old 1mo	+	+	N	Low
1yr 1mo	+	+	N	Low
1yr 1mo	+	+	N	Low
Old 5mo	-	+	N	Low
Old 4mo	+	+	N	Low
Old 3mo	+	+	N	Low

- Positive is **GOOD**
- Positive test in an adult dog with no clinical signs indicates **low risk**
- Low risk does not equal NO risk
- Negative test indicates high risk
- High risk does not equal disease
- Clinical sings means high risk – no testing needed

 **Puppies?**




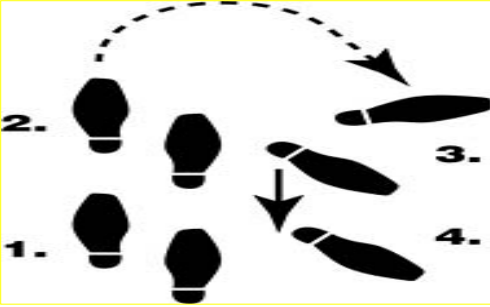
- **Negative titer = High Risk**
- **Low Risk? – only for now**
- Interpreting positive antibody levels in puppies is less clear
- Prevention!

 **Step Four: Evaluate Risk**

- How high is the risk?
- Vaccination practices?
- Sanitation practices?
- Co-mingling practices?
- Level of current disease?
- Age?

- Not Stray vs. Surrender
- Not all friendly dogs

 **Step Five: Shuffle**






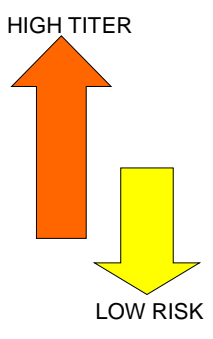
Clinical Signs




- Isolate or remove sick dogs
- Carefully weigh risks of keeping sick dogs in the shelter.
- Can you care for sick dogs?
- Post-recovery shedding can be prolonged
- Ideally, two negatives before release



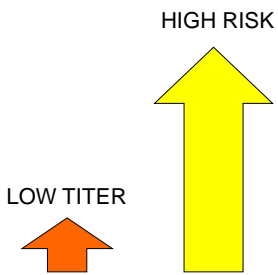
Positive In-House Titer = Low Risk



- Send them home
- Inform potential adopters
- Keep separate from “clean” population
- Move as cohorts whenever possible




Negative or Low Titer = High Risk



- What to do?
- Remember this list?

Problems:

- LONG incubation period
- Ease of transmission
- Clinical signs overlap with CRDC
- “Reservoir” dogs
- Susceptible puppies


 **Quarantine and release?**

- Risk evaluation often allows many (most) dogs to be saved.
- Quarantine alone would be 6 weeks
- Challenges to capacity and welfare
- Begin quarantine –
- Cleared when no clinical signs plus
- Antibody positive and pcr negative
- Consider impact on capacity and crowding
- Consider maintenance of health and emotional well-being


 **Can you safely send them somewhere else?**



- Prioritize Healthy High Risk Dogs**
- **What is safe?**
- Well vaccinated adult dogs
- Resilient humans
- No puppies
- No uninformed adopters


 **Depopulation**

“The **Association of Shelter Veterinarians** believes that depopulation in response to a disease outbreak should only be considered as a last resort, when morbidity and mortality of disease are uncommonly severe. While depopulation may create a break between exposed and unexposed populations and lead to quicker resumption of normal sheltering activities, it may result in the euthanasia of healthy animals. Along with stakeholders such as shelter administrators, board members, and staff members, veterinarians experienced in outbreak management should be consulted for guidance before deciding to depopulate.”




Long Term Response Plan


- Eliminate risk factors
- Vaccinate ON INTAKE
- Protect the pups
- Disease detection at intake and ongoing
- Isolate or separate sick dogs
- All in / all out
- Planned co-mingling (if unavoidable)
- Encourage vaccination in your community



Summary



- CDV is one of the most preventable infectious diseases we battle.
- Help work toward a community solution.
- Don't wait for an outbreak to put good practices in place.
- Outbreaks can be managed in life saving ways.



Thanks to you, everyday.

