

Vaccination Strategies for Shelters and Rescue Groups

Sandra Newbury, DVM

National Shelter Medicine Extension Veterinarian

Koret Shelter Medicine Program

Center for Companion Animal Health

U C Davis School of Veterinary Medicine

spnewbury@ucdavis.edu

with thanks to Dr. Ron Schultz,
UW Madsion and Dr. Kate
Hurley, UC Davis

Canine and Feline Guidelines

- American Association of Feline Practitioners
 - Feline Vaccine Guidelines 2006
- American Animal Hospital Association
 - Canine Vaccine Guidelines 2006

Vaccinations: true or false?

- Pets cats are rarely exposed to infectious diseases.
- It's best to split vaccines in kittens, only vaccinating against one disease at a time.
- Vaccines can cause disease in stressed animals.
- You should never vaccinate a sick or injured animal.
- Most adult animals entering shelters have already been exposed to the diseases we vaccinate against.
- Vaccines take so long to provide protection, they will not help much in a high turnover environment.
- It's better to let animals spend a few days adapting to shelter life before vaccinating.

FALSE!

What are vaccines?

What are vaccines?

- Whole or part of an infectious organism (pathogen)
 - Virus, bacteria or fungus
- Stimulate antibodies and cellular immunity



What are vaccines?

- One of the most important tools to protect your shelter animals from serious disease
- Can lessen the severity of some disease
- Can prevent some disease altogether
- Important for shelter AND community health

Considerations

- Vaccine: agents, type, route
- Animals: which, when, boosters
- Handling and storage: Who, how, documentation
- When things go wrong: prevention and management of adverse reactions

Not all vaccines are created equal

- Efficacy
 - Prevent infection?
 - Prevent symptoms?
 - Always, or only sometimes?
- Speed
- Duration
- Safety



Developing a vaccination strategy

Where are you?



≠



Where are you?



- Vaccination strategies work most effectively when individualized for **each** patient, or **group** of patients when working with a “herd”.

Strategic Goals

House Pets / Low Risk Environments?

- Adequate protection
- Minimize adverse effects
- Minimize frequency of re-vaccination
- Duration of immunity

Shelter Animals / High Risk Environments

- Onset of immunity
- Immediacy of protection

General principles for house pets

- Over-vaccination?
Not best solved by **NO** vaccination
- Duration of immunity studies that have led to recommendations to decrease *frequency* of re-vaccination are based on an **initial vaccine series** that affords, at least, some **protective immunity** to the animal.

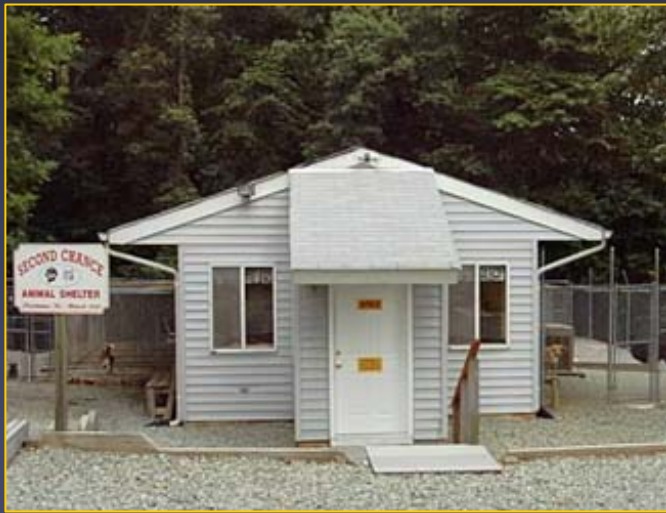


General Principles for Shelter and Rescue Pets?

**RAPID
PROTECTION!**

...in the face of almost certain exposure

General principles of shelter vaccines



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Where do foster homes, rescuers, boarding facilities, disaster kennels, breeding kennels fit?

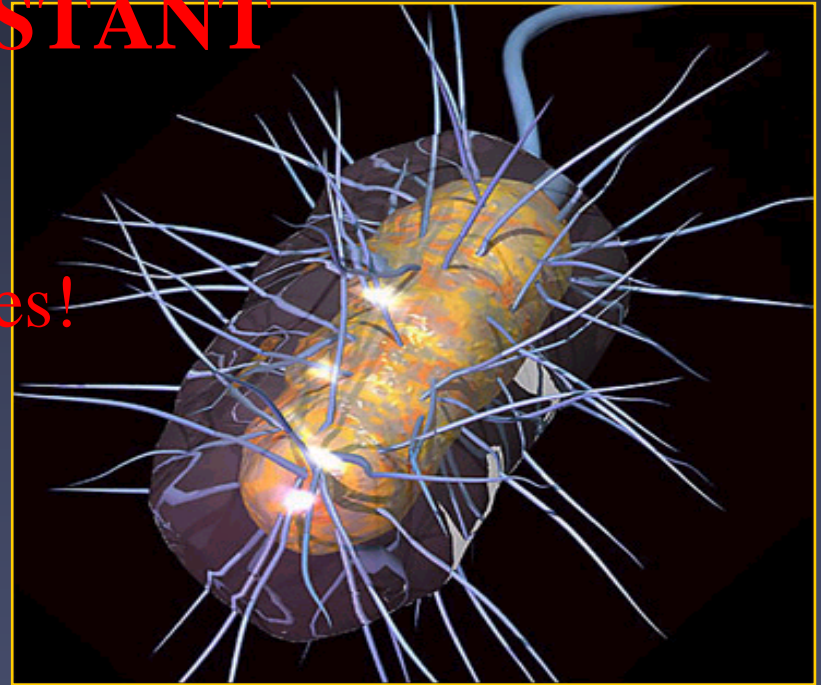
And yet...

- The basic principles remain mostly the same.

Evaluating Risk

What to vaccinate against?

- Infectious threat **CONSTANT**
 - Frequency **Yes!**
 - Severity **Yes!**
 - Ease of transmission **Yes!**
- Risk/benefit ratio
 - Efficacy
 - Side effects
 - Cost



Some things to consider

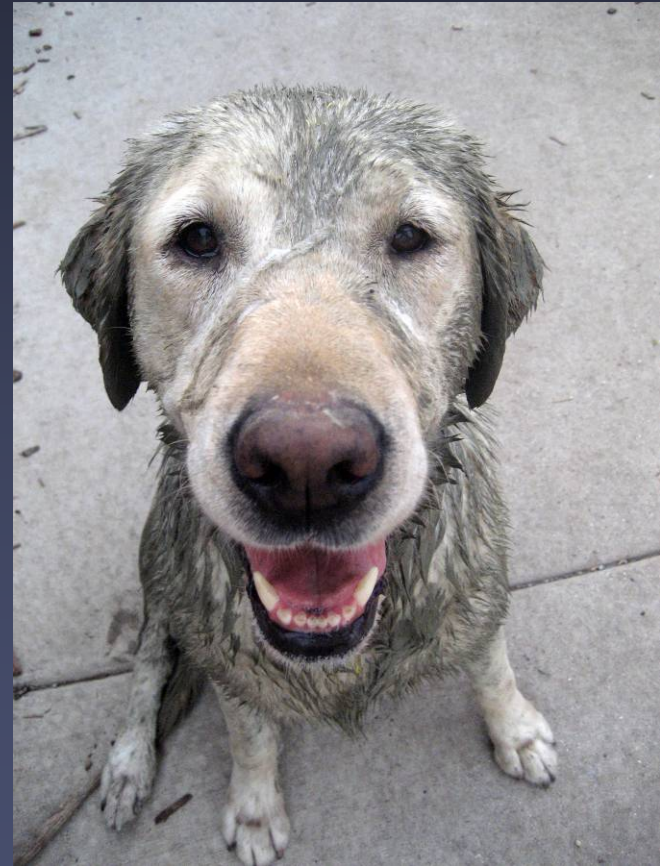
- Virus versus bacteria, protozoa, fungus
 - Safety AND efficacy
- Systemic versus secretory
 - Type of systemic (antibody versus cell mediated)
- Strain variability
- Modified live versus killed/inactivated vaccine
- *No vaccine does better than the animal's response to natural infection*

A short list of really good vaccines against really bad feline diseases

- Canine Distemper
- Parvo
- Panleukopenia
- Rabies

Lucky Us

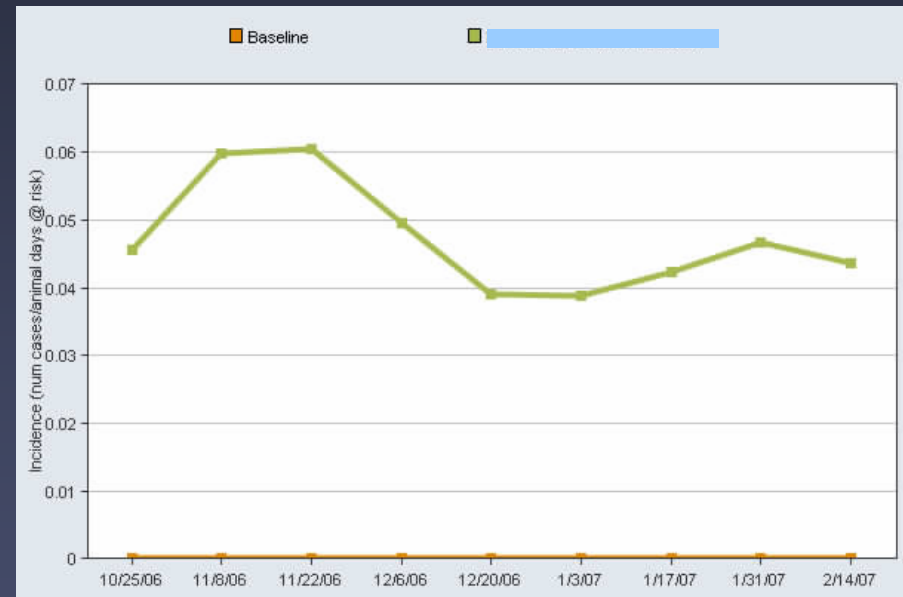
- Persistence of parvo viruses in the environment
- Difficulty differentiating between kennel cough and distemper
- Life threatening nature of these infections



What about at my place?

Incidence Tracking

- Evaluate need
- Evaluate current or new protocols
- Recognize and respond to problems
- Track severity and outcome
- Track success and investment



Disease Detection



- Know your enemies
- Early detection critical tool to control transmission
- Critical for evaluating success
- Whenever possible, prevent post-adoption heartache

Immunity

Active Immunity

- Vaccine
- Natural Infection / Exposure

- Circulating antibodies
- Memory Cells

- Primed response to infectious agents

Passive immunity

- Passively acquired
 - Maternal antibody
 - Serum
- Circulating antibodies
 - Maternal antibody
 - Serum
- No reinforcements



Not all animals are equally vaccinate-able

- Age
- Background
- Genetics
 - Breed differences
 - Congenital non-responders
- Physical condition



Herd Immunity?

- Starts in the community
- Shelter safeguards at intake
- Most important for distemper, parvo and panleuk!



Feline Panleukopenia Serology Study Results

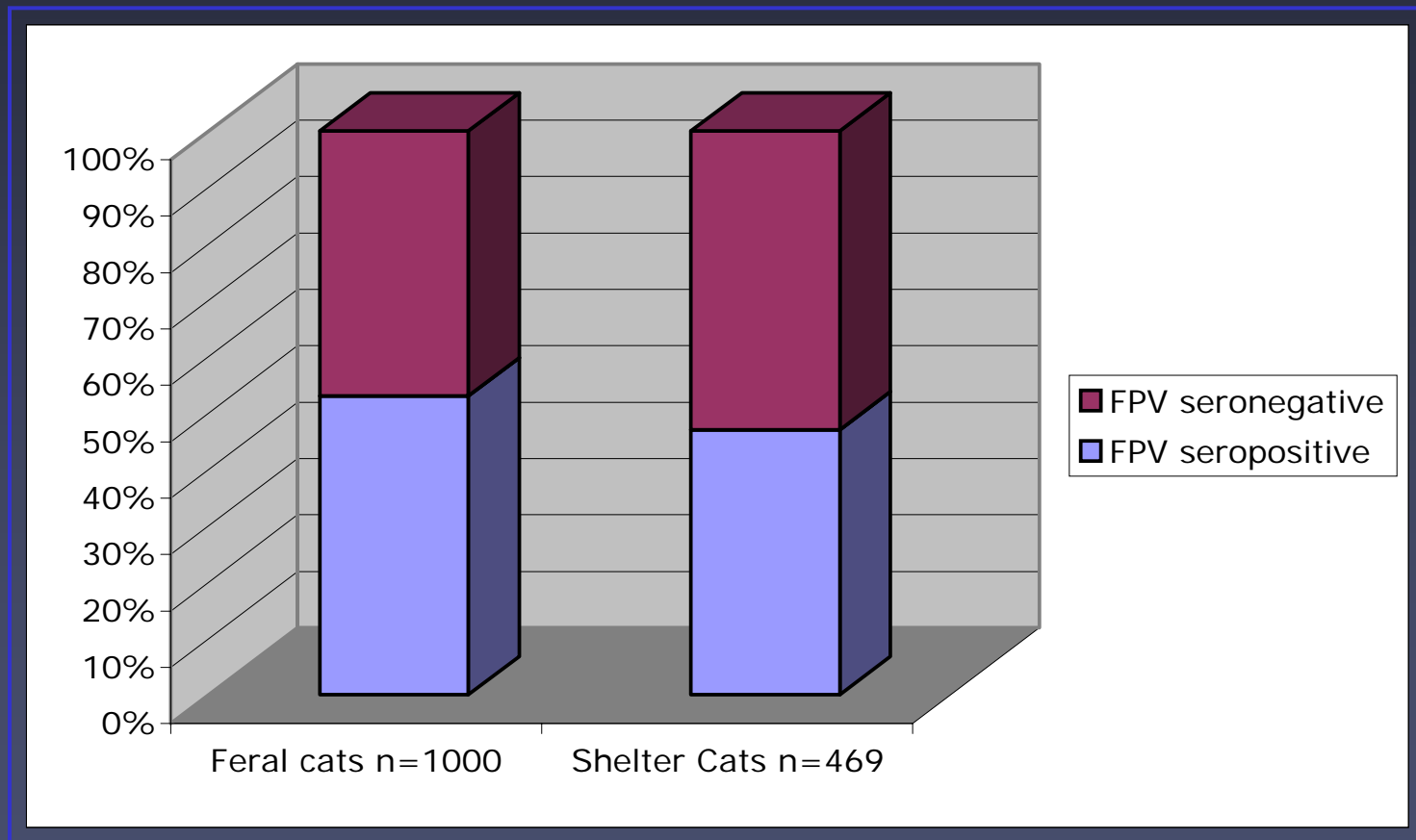


Figure 1

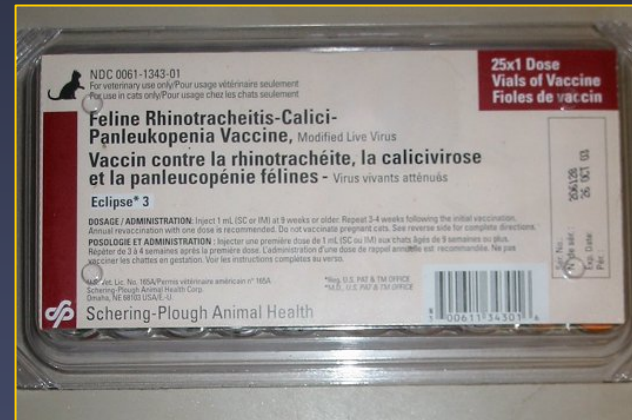
Protection?

While it has been commonly accepted that a large proportion of cats have been exposed to Panleukopenia and developed protective immunity by the time they reach adulthood the present study, as well as others previously published, provides information that is of significant concern, especially for cats entering a shelter environment.

The Tools

Types of vaccines

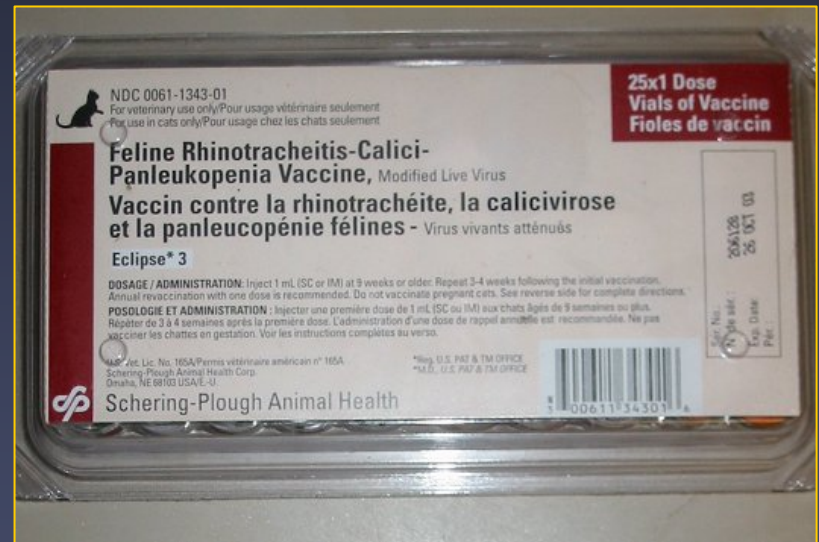
- Modified-live
 - Intranasal
 - Subcutaneous
- Killed
- Recombinant



Double check labels!

Modified live advantages

- Single dose can protect
- Rapid immunity possible
- Better at overcoming maternal antibodies
- Cell mediated and mucosal immunity is possible
- Possibly less likely to cause sarcomas



Modified live disadvantages

- Can cause infection and mild signs of disease
 - Especially feline URI
- Severe disease in
 - Fetus/newborn
 - Severely immunosuppressed
 - Wrong route**
- Can cause shedding → interferes with testing
- Require careful storage



Killed vaccines

- Much less likely to cause mild signs
- Do not shed into the environment
- Remain stable in storage and when handled
- BUT...
- Require minimum 3-4 weeks to provide protection ☹️
 - 2 weeks, then a booster, then another 1-2 weeks
- More likely to cause anaphylactic vaccine reactions and possibly sarcomas

Vaccine route: intranasal 😊

- Always modified live
- Rapid protection (2-4 days)
- Local immunity
- No maternal AB interference – good for respiratory protection in youngsters
- No injection, ergo no sarcomas



Vaccine route: intranasal ☹️

- Can cause signs of dz
 - Transient sneezing in up to 30% ?¹
 - Or maybe not?²
- Poor protection against panleukopenia
- Can cause scratching, writhing, and escaping



Can and will shelter staff do this?

1. Lappin, M. R., R. W. Sebring, et al. (2006). Journal of Feline Medicine & Surgery.
2. Edinboro, C. H., L. K. Janowitz, et al. (1999). Feline Practice **27**(6): 7-13.

The Basics

Basic Cat Vaccines (FVRCP / PCR)

- Feline Panleukopenia (FPV) **P**
- Feline Calicivirus (FCV) **C**
- Feline Herpes Virus (FVR) **R**

Basic Dog Vaccines

DHPP / DA2PP and “kennel cough”

- Canine Distemper Virus **D**
- Canine Parvo Virus **P**
- Adenovirus **H or A2**

- Parainfluenza virus **P or PI**

- Bordetella bronchiseptica **Bb**

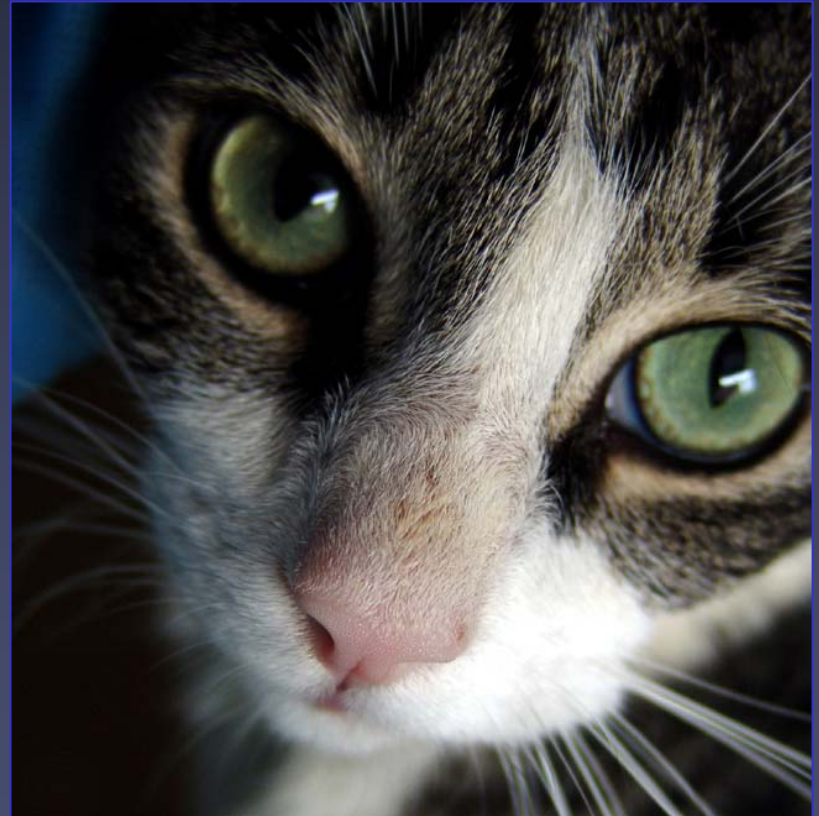
What to choose?

- MLV injectible for severe systemic diseases
 - Panleukopenia
 - Parvo
 - Canine Distemper
- Respiratory virus vaccine choice in cats may vary
- IN “kennel cough” vaccine probably most helpful for prevention

Basic Shelter Cat Vaccination

Cats

- **SubQ MLV FVRCP**
 - Kittens every 2 weeks from 4 - 18 (20?) weeks
 - Adults once at intake **or sooner**
 - Double check that it's **live**
- +/- IN FVRC once at intake



IN vs. Parenteral MLV Panleuk

- Lappin et al. 2002
 - SPF kittens with no MDA did respond to IN vaccination with antibody titers considered to be protective
 - IN vaccinated kittens were protected from challenge 9 months later.
- Schultz et al. 1973
 - Intranasally vaccinated cats developed serum titers similar to those vaccinated SQ
- **BUT...**Clinically, many more outbreaks have been reported by shelters using only an IN 3 way product without an additional parenteral MLV FPV vaccine.

Basic Shelter Dog Vaccination

Dogs

- SubQ MLV DHPP or DA2PP
 - Puppies every 2 weeks from 4 - 18 (20?) weeks
 - Adults once at intake **or sooner**
- IN “kennel cough vaccine”
 - 2 way
 - 3 way
 - Once at intake



Which animals to vaccinate

- ALL OF THEM
- Except:
 - Feral
 - < 4 weeks (except IN respiratory or rCDV)
 - *Severely* ill
 - Pregnant?



If a shelter absolutely can't...

- Best guess at intake:
 - Will this animal be placed up for adoption or...
 - Will this animal be in the shelter > 1 week?
 - Vaccinate these at intake
 - Recognize limits
- Rescue groups identify “type” and donate vaccine*
- Promptly euthanize non-adoptable



Vaccines for Babies

Vaccines for babies

- Shelters are no place for puppies or kittens < 6 weeks old
- Neither are foster care homes with lots of litters coming in and out
- Keep isolated, get out *immediately* to home with low traffic



If you *must*...

- Balance risk for mothers expected to carry to term
- FVRCP SC MLV if serious threat
- DO vaccinate NURSING moms
- Consider MLV FVRC IN starting at 2-4 weeks for kittens



...weigh the risks



- rCDV for puppies from 2 weeks of age
 - Merial PureVax Ferret
 - Give only 1/3 dose provided (0.33 cc)
- Gives **no protection for parvo**
- Consider DHPP / DA2PP

In the face of exposure

- Vaccines will not help after exposure
- (Vaccine will not hurt after exposure)
- Anti-serum *may* help
- From healthy, immune donor
- 2 mls per kitten/kg SC
- Delay vaccines 2-4 weeks
- Canine lyophilized IgG

Did you just say panleuk???



Vaccines for pets of fosterers and shelter workers

- Disease WILL be introduced
- MLV, recombinant, killed or titers are okay, but...
- *Complete all series* before bringing in fosters
- No need to exceed recommended intervals
- Titer check?



Vaccine handling and administration

- Buy from distributor, not internet
- Refrigerate but do not freeze
- Do not split doses
- Do not stagger vaccines
- Do not reconstitute ahead of time
- Avoid multi-dose vials if possible



Vaccine handling and administration

- Check local laws to see who can administer:
 - General vaccines
 - Rabies
- Document vaccine, manufacturer, date, serial number, who gave, where injected
- Follow AAFP site guidelines
- Always report mistakes



FVRCP right shoulder

Rabies right rear

FeLV left rear

Timing is Everything

When to vaccinate?

- How long until vaccines provide protection?
- SC?
- IN?
- MLV?
- Killed?



When to vaccinate in a shelter setting?

- IMMEDIATELY UPON INTAKE..or sooner
- Revaccinate injectible every 2 weeks until 18 (20?) weeks
- Consider revaccinating adults once or after adoption
- Never < 2 weeks



We've known this for a while

- The time necessary to obtain the immunity of cats against **Panleukopenia** has been studied by means of a modified live vaccine. This vaccine makes it possible to obtain a very early post-vaccinal immunity: the full immunity is reached 72 hr after the inoculation of the vaccine by the subcutaneous route. Furthermore, we have demonstrated that a sensitive kitten can be admitted in a contaminated environment immediately after vaccination without showing any clinical evidence of the disease.

* Brun et al. Immunisation against panleukopenia: early development of immunity. *Comp Immunol Microbiol Infect Dis.* 1979;1(4):335-339.

When to vaccinate?

- “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?”

When to vaccinate?

- “All of the Recombitek vaccinated puppies were protected from development of clinical distemper...My study was designed to test the efficacy of a single dose or rCDV. The results indicate that protection was provided as soon as **4 hours** after vaccination, something previously known to occur only with MLV CDV.”

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.

Why does this help?

- Vaccines take time to provide complete protection
- BUT...
 - *Disease takes time to get established*
 - *Vaccine virus itself may compete with real virus*
 - *Some responses are within minutes*
- Immediate vaccination helps you win the race **MUCH OF THE TIME**



Why isn't it perfect?

- Shedding from non-clinical dogs
- Not all dogs are equally immunizable
- MDA
- Incubating infections



Revaccination

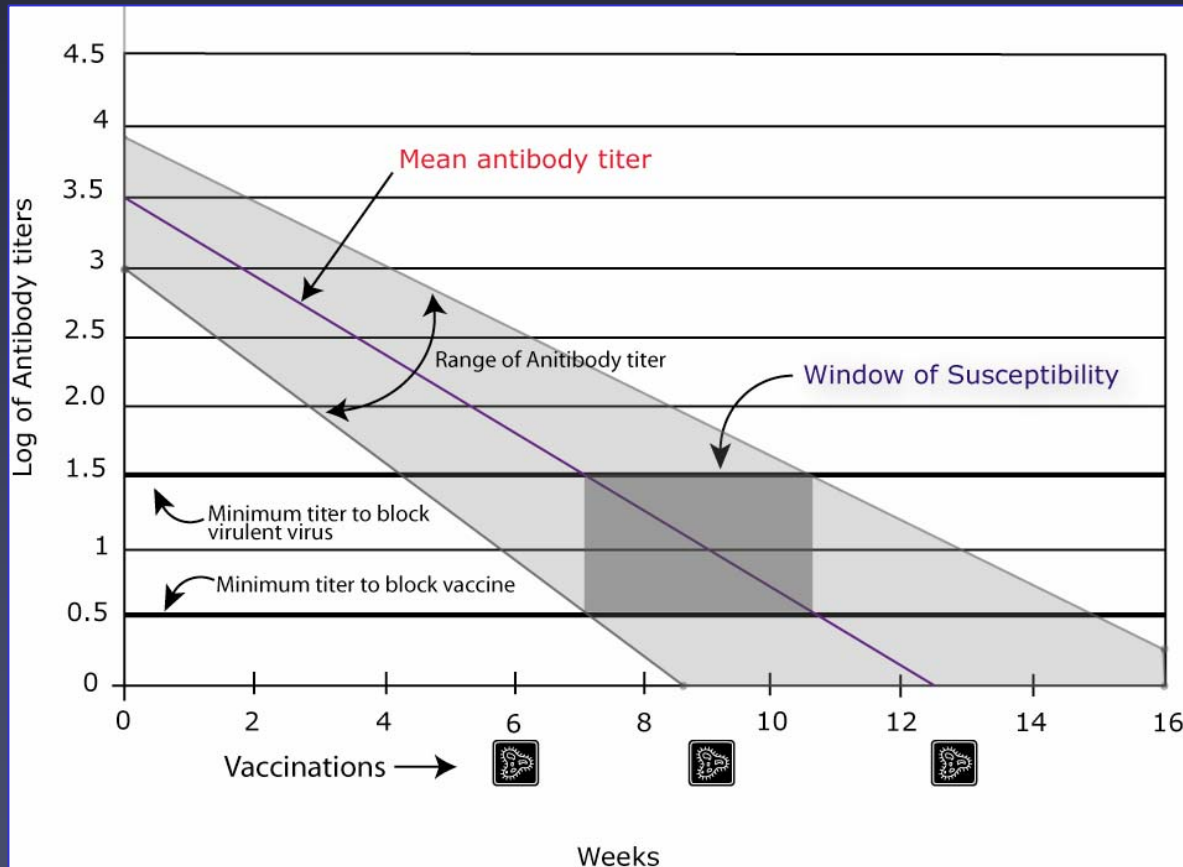
Maternal antibodies

- Passed to newborns in colostrum during first hours of life
- Affected by:
 - The mother's antibody level during pregnancy
 - The mother's ability to make colostrum
 - How often the newborn nurses
 - The newborn's intestinal absorption
- Varies between littermates
- Lower in large litters
- Declines over time

A mixed blessing

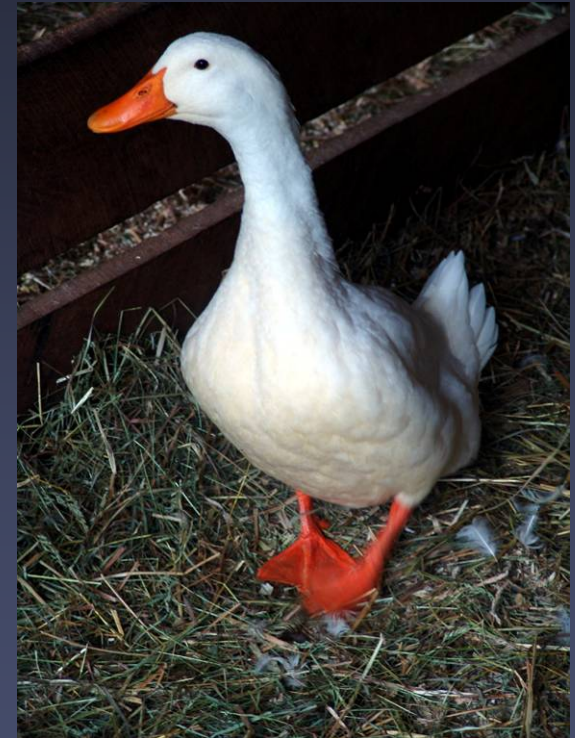
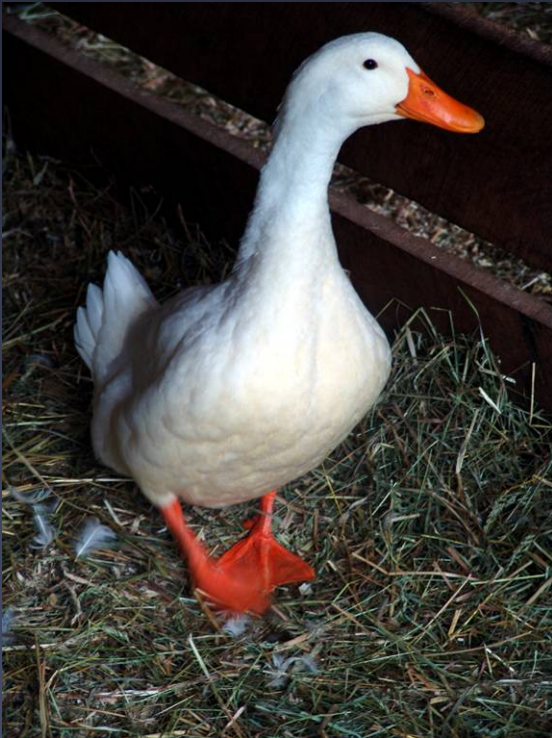
- Maternal antibodies neutralize vaccine as well as germs
- Maternal antibodies “wear off” by 4-18 (20) weeks
 - *Later in strays than pets?*
- Germs are stronger than vaccines → window of susceptibility
- Race between vaccine response and disease

The problem



Adapted from Greene's infectious diseases of the dog and cat: Thanks Mike!

Sitting ducks



Kittens and puppies must be protected through mechanical isolation as well as (more than) vaccination

Why *revaccinate*: failure to respond

- Temperature > 103.6
- Concurrent infection
- Stress, malnutrition
- Incorrectly administered vaccine
- Most animals **WILL** respond
- Consider revaccination after adoption



Failure to respond?

- Puppies given 10 mgs/kg prednisone x 3 weeks, then vaccinated¹
- Challenged with canine distemper 3 days later
- Depressed lymphocyte response but all were protected against virulent challenge
- Vaccination plus surgery did not impair response to distemper/parvo²



Vaccine failure: why?

- Already infected
- Maternal antibody
- Overwhelming dose
- Congenital non-responders
- Handling or compliance problem
- Vaccine problem
 - Resistant strain
 - Production problem
 - Contact manufacturer

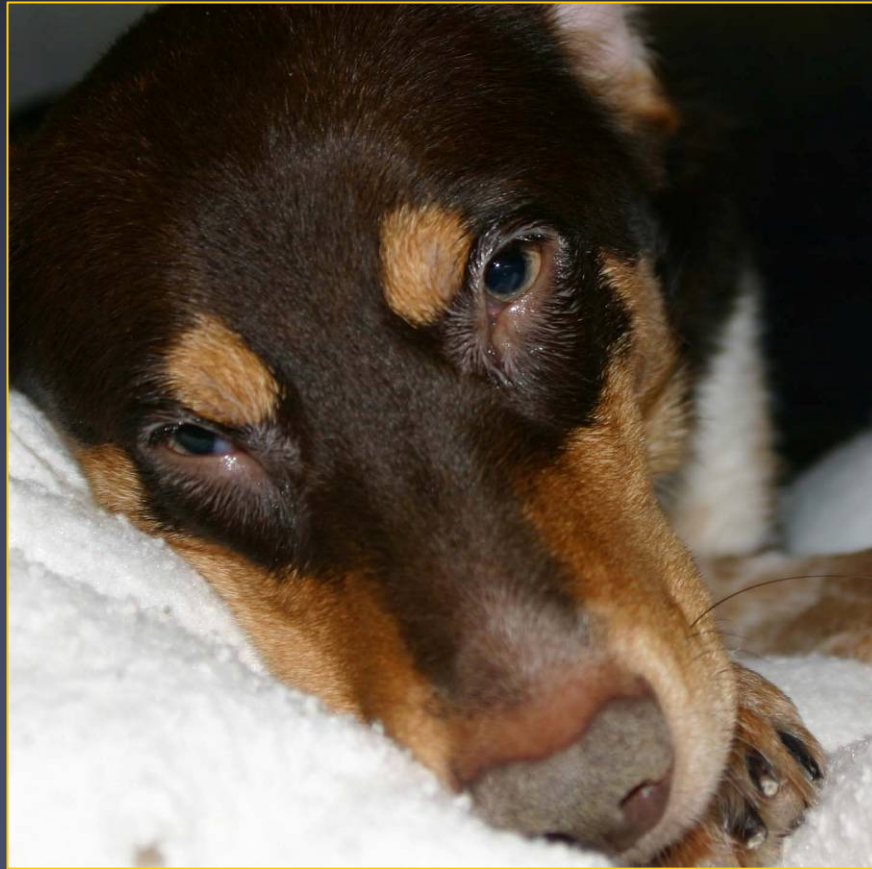


Never better than natural response

Always **OBSERVE** vaccination if vaccine failure is suspected



Disease in a vaccinated animal does
not equal vaccine resistant agent



Vaccination Post-Adoption



- Establish a veterinary relationship
- Babies until 16-20 weeks
- Backup system

Adverse Events

What else can go wrong?

- Local
- Mild symptoms
 - Life threatening if misinterpreted
- Severe disease
 - Wrong route
- Sarcomas
- Hypersensitivity/ Anaphylactic shock
 - Rare with core vaccines
 - POST SIGNS AND PROCEDURE
 - Document carefully



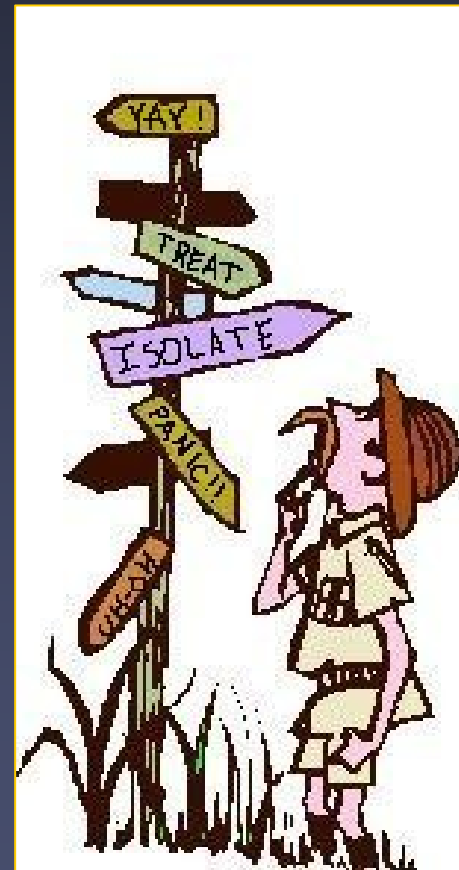
Adverse Reaction Symptoms

- Pruritic face
- Drooling,
- Incoordination
- Severe swelling
- Difficulty in breathing
- Vomiting and diarrhea
- Collapse.

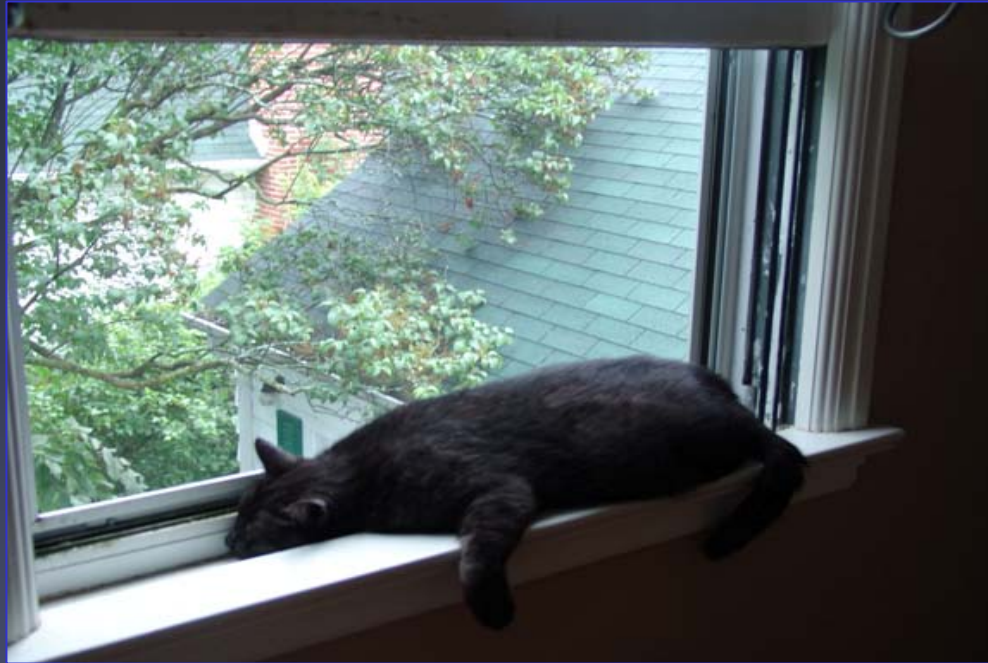
➤ British National Suspected Adverse
Reaction Surveillance Scheme:
0.004% = 4 in 100,000

Wrong Route

- IN *Bordetella* Sub Q
 - Seek immediate veterinary care
 - Local gentamycin in saline
 - Oral antibiotics
 - Monitor
- SC FVRCP IN
 - Don't draw up near nose
 - Clean spills with alcohol or bleach



Summary: Maximizing Vaccines for Pets



- Establish effective immunity where possible
- Do not re-vaccinate more frequently than recommended
- Evaluate risk for each individual when making a vaccination plan
- Re-evaluate risk as part of wellness exams

Summary: Maximizing Shelter Vaccines

- Vaccinate against *important diseases only*
- Vaccinate *immediately*
- Vaccinate *everybody*
 - With a few exceptions
- Repeat *frequently* in youngsters



Maximizing shelter vaccines

- Transport in a **clean** carrier and **clean** vehicle
- Place on a **clean** surface
- Handle with **clean** hands and clean clothes
- Place in a **clean** cage
- Leave alone for at least 24 hours
- Protect kittens and puppies



Community Connections

- Control shelter disease by improving community health
- Improve community health by controlling shelter disease
- Disease is expressed and amplified in shelter, but does not start or end there



Vaccine resources

- AAFP guidelines for cats
- AAHA guidelines for dogs
- www.sheltermedicine.com
- http://www.sheltermedicine.com/portal/is_vaccination.shtml#topx
- [UC Davis pet animal vaccine guidelines](#)
- Greene's Infectious Diseases of the Dog and Cat

No substitute for stress reduction
and good husbandry



Thanks for your caring!



It is people like you who make this possible, over and over again.

The End

