UPDATE on VACCINE ISSUES

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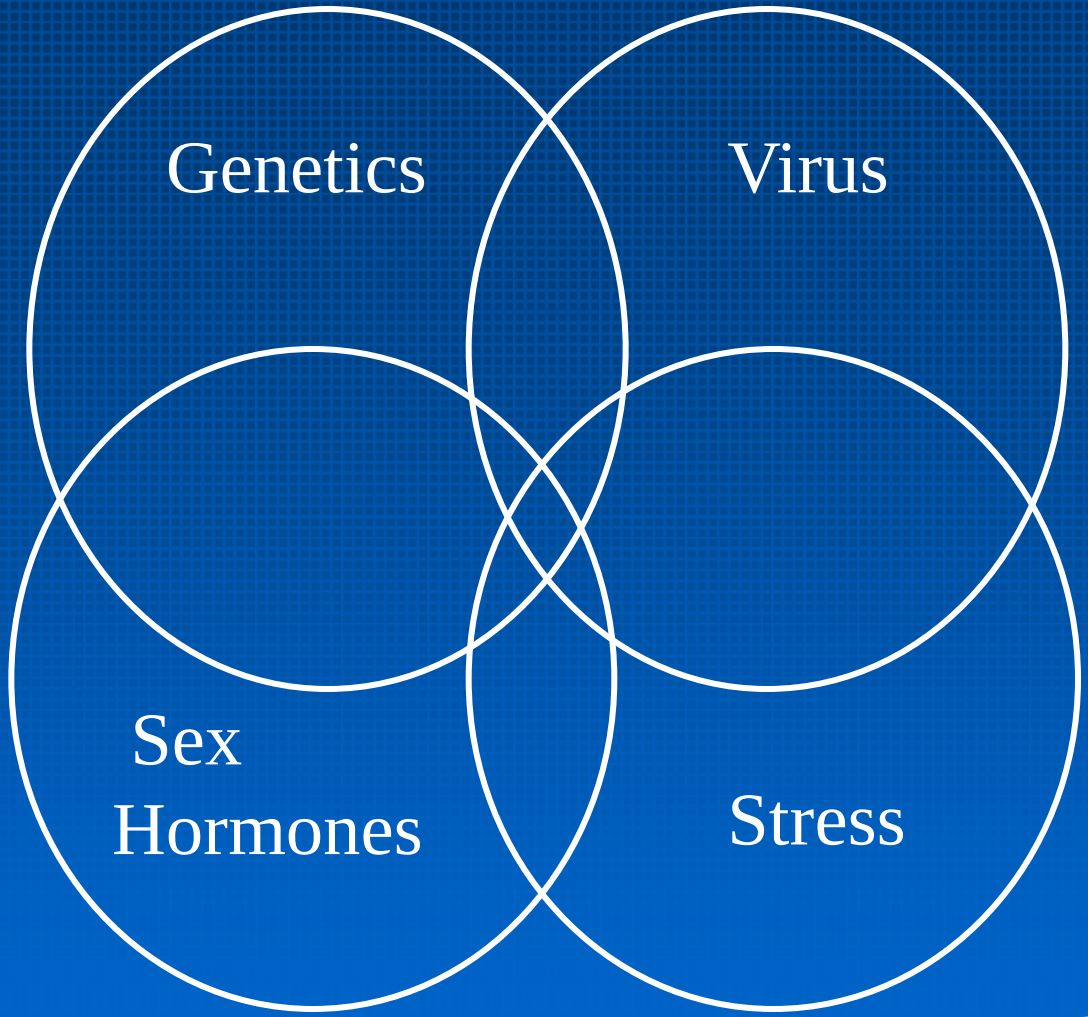


Etiology of Autoimmune Diseases



Autoimmune Diseases

Autoimmunity:

1) Develops in genetically susceptible individuals;

2) May be triggered by environmental agents operating by nonspecific inflammation and/or molecular mimicry;

3) Is the result of the sum of genetic and environmental factors that override normal mechanics of self-tolerance; and

4) Is most often mediated by T cells or is characterized by an underlying dysfunction in T cells.

(Sinha et al. Science, 248, 1380-1388, 1990)

Key Points on Vaccine Issues

- modern vaccine technology has afforded effective protection of companion animals against serious infectious diseases
- but, this advancement brings increased risk of adverse reactions (vaccinosis)
- some are serious, chronically debilitating and even fatal
- must balance this benefit : risk equation
- " Be wise and immunize, but immunize wisely ! " (Ron Schultz)

Benefits of Vaccines

- more lives saved, more animal production safeguarded than any other medical advance
- eradicated smallpox, & nearly all polio and measles in people
- first vaccines were against small pox, anthrax, and canine distemper
- significantly reduced endemics of canine distemper, hepatitis and parvovirus, but not in wildlife reservoirs
- significantly reduced endemic feline panleukopenia
- eliminated rabies in Europe; eradicated Rhinderpest in Africa, foot & mouth disease in Europe

Vaccines & Population (Herd) Health

- To protect the population (herd) = 70 % immunized with "core" vaccines ..... but .....
- Dog population = only about 50% immunized
- Cat population = only about 25% immunized
- Best "vaccine" = natural exposure, but about 50% of susceptible puppies or kittens will die of the disease
- Vaccine non-responders and low-responders = genetic trait



Vaccine Non-Responders

- Genetic trait ; do not breed them
- They will remain susceptible to the disease life long
- Rate = 1:1000 for CPV (parvovirus)
  - Especially Black Labradors and Akitas
- Rate = 1: 5000 for CDV (distemper virus)
  - Especially Greyhounds
- Rate = zero for CAV (hepatitis, adenovirus)
- Rate = unknown for cats



Adverse Reactions & Cautions

Canine Distemper Virus

- Rate = 1:100,000 for Rockborn & Snyder Hill vaccine strains
- Rockborn strain CDV found in most of today's MLV vaccines
- Produces PVE = post-vaccinal encephalitis, blindness & death
- Recombinant (rCDV) Recombitek (Merial) cannot cause PVE
- Rate = 1: 500,000 for Onderstepoort strain , but less potent
- When MLV CDV combined with adenovirus (Hepatitis) in combo , risk of immune suppression and PVE increases– especially in puppies

Vaccination , Exposure & Protection

CDV (distemper virus)

- Vaccinates immediately protected, if exposed simultaneously
- MLV CDV does not shed appreciably

CPV (parvovirus)

- Vaccinated protected after 48-72 hrs; exposed pups get sick
- MLV CPV sheds from post-vaccine days 3-14; exposure risk
- Shed vaccine CPV not seen on Idexx SNAP, but present on CPV PCR of feces for 2 weeks

Kennel Cough & Vaccines

Intranasal Bordetella

- Contains interferon , which impairs growth of other respiratory viruses (parainfluenza, adenovirus - 2, influenza)
- Injectable Bordetlla vaccine does not contain interferon
- Hypersensitivity reactions known with intranasal vaccine
- Kennel cough vaccines are **not** 100% effective . Needed ?

Influenza **(vaccine needed?)**

- Produces fever whereas kennel cough does not
- When combined with Strep., 2-3% will die

Alternatives to Current Vaccine Practices

- measure serum antibody titers
- avoid unnecessary vaccines or over-vaccinating
- caution vaccinating sick or febrile animals
- tailor specific minimal vaccine protocol for dogs/cats breeds or families at risk for adverse reactions
- start vaccination series later (9-10 wks, dog; 8 wks cat)
- alert caregiver to watch puppy/kitten behavior and health after boosters
- avoid revaccination of those with prior adverse event

“Core” Vaccines *

Dog	Cat
Distemper	Feline Parvovirus
Adenovirus	Herpesvirus
Parvovirus	Calicivirus
Rabies	Rabies

* Vaccines that every dog and cat should have



Maternal Immunity & Protection

Milk Replacer

- Feeding milk replacer proteins instead of natural colostrum will coat bowel of newborns and shut down absorption of antibodies needed for protection from disease
- Give FFP (Fresh-Frozen Plasma) immediately to orphan or weak pups to get passive immunity ; then add milk replacer

Vaccine Timing

- Last puppy vaccine at 14-16 weeks for protection
- Last kitten vaccine at 12-14 weeks for protection

Vaccine Dosage

Body Mass

- Same dose intended for toy and giant breeds
- Why ?
- MLV vaccines -- immunogenic principle not based on body mass
- Killed vaccines -- should be adjusted for body mass
- Minimum/optimum doses for protection
- Excess antigen present

Vaccine Dosage (cont'd)

Age

- Optimal age for response
  - 12 wks + for puppies;
  - 10 wks for kittens;
  - Same for all breeds and sizes?
- Earliest age for safety
  - 6 wks for puppies and kittens
- Effective age varies
- Blocking effects of maternal immunity

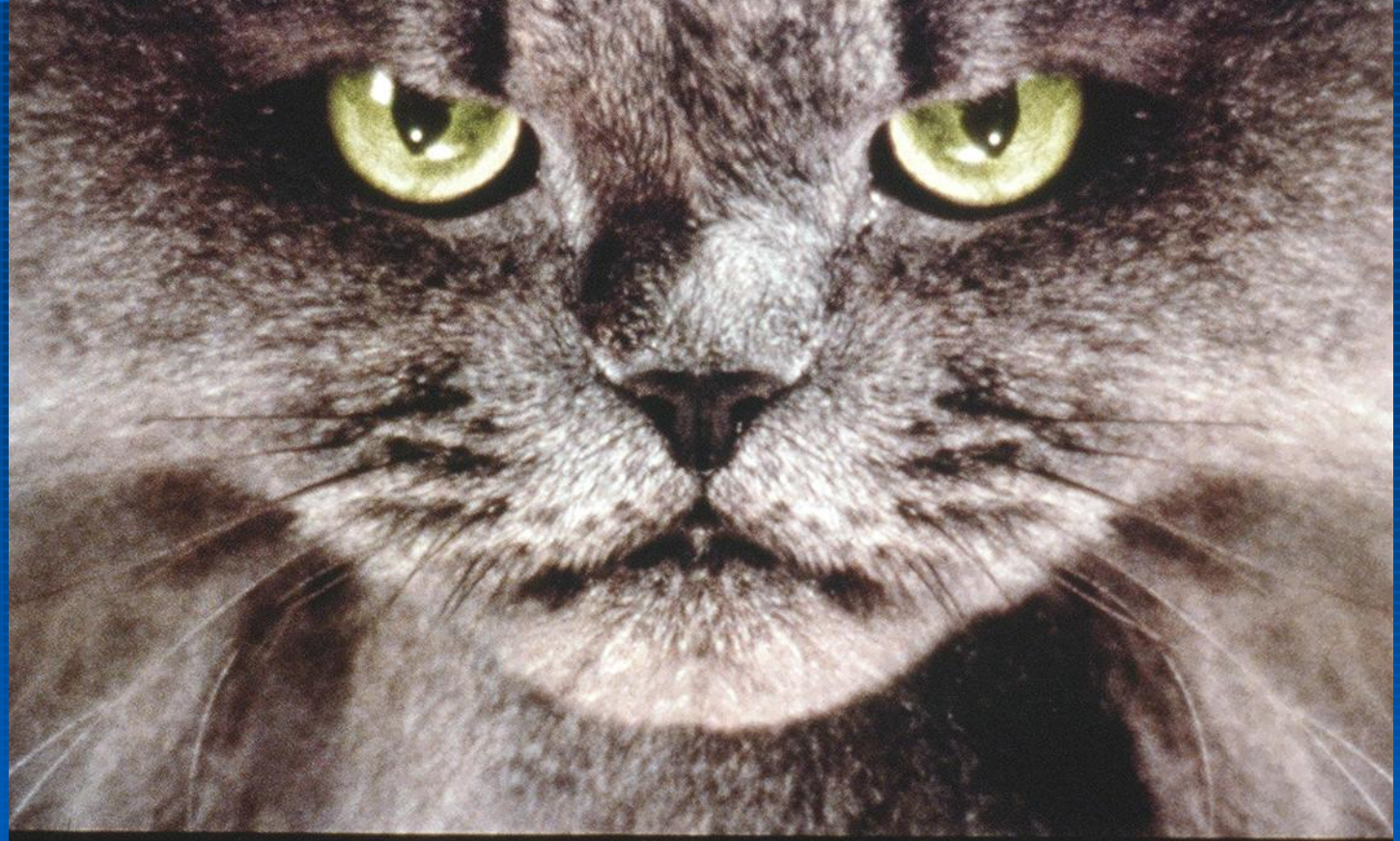
Hormonal State During Vaccination

Avoid Vaccination

- Period just before estrus (30 days)
- During estrus
- Pregnancy
- Lactation

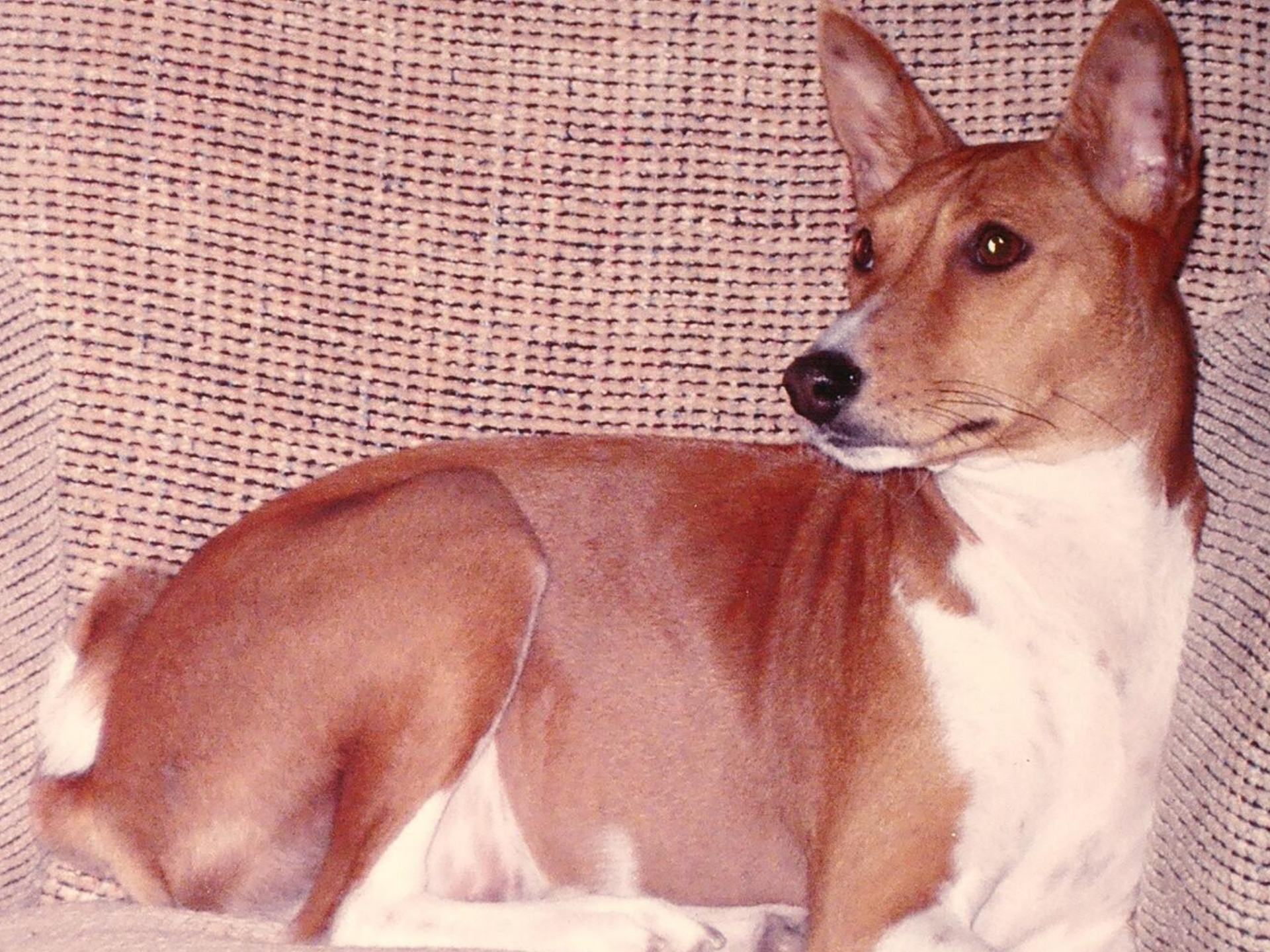
Periodicity of Booster Vaccinations

- No evidence that annual boosters are necessary
- Need to lengthen interval
  (every 3-5 years for healthy adults)
- Geriatric animals vaccinated only with caution
- Monitor serum antibody titers instead



You Want To Do *What* With That Needle?


CENTURY
STEPS
USE NO SALT OR DE-ICER




Thank you!

Canine & Feline Minimal Vaccine Protocol

- Core vaccines [AAHA, AVMA, AAFP]
  - Dog: CDV, CPV-2, CAV-2, Rabies
  - Cat: FPV, FHV, FCV, Rabies (where required)
  - Optional vaccines (depends on regional needs/risk)
  - Vaccines for zoonotic disease (leptospirosis, = Yes giardia = No?)

Current Vaccine Guidelines

- Compliance ?
  - Acceptance of national policies
  - Understanding of benefits and risks
  - Concept of core and optional vaccines
  - Safety and adverse events
  - Over vaccination, duration of immunity, and breed predispositions issues
  - Discuss issues and options (titers) with clients

Current Vaccine Guidelines

- Resistance ?
  - Still controversial
  - Denial and avoidance
  - Failure to obtain client informed consent
  - Still vaccinate animals with illness, chronic diseases, and prior adverse events
  - Believe rabies boosters needed legally even with pets at high risk for reactions

Current Vaccine Guidelines

- Failure to offer options (titers) to clients
- Pet owner awareness and concerns
- Ignorance and the impressionable client
- Public trust of veterinarians questioned
- Perceived conflict of interest ($ versus options)
- Failure to recognize or denial of adverse events
- Need for legal mandate standard for rabies vaccination

Options & Solutions

Education, education, education

- Understand duration of vaccinal immunity
- Accept potential for adverse events
- Recognize adverse events rather than dismiss or deny them
- Inform clients of issues and encourage options
- Offer titers for core vaccines triennually/more often
- Explain optional vaccines may not be needed

Canine Vaccine Adverse Events*

- Retrospective cohort study; 1.25 million dogs vaccinated at 360 veterinary hospitals
- 38 adverse events per 10,000 dogs vaccinated
- Inversely related to dog weight
- Vaccines prescribed on a 1-dose-fits-all basis, rather than by body weight.
- Increased for dogs up to 2 yr of age, then declined
- Greater for neutered versus sexually intact dogs
- Increased as number of vaccines given together increased
- Increased after the 3rd or 4th vaccination
- Genetic predisposition to adverse events documented

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from Moore et al, JAVMA 227:1102–1108, 2005

Vaccine Conclusions for Canines*

- Factors that increase risk of adverse events 3 days after vaccination:
- Young adult age
- Small-breed size
- Neutering
- Multiple vaccines given per visit
- These risks should be communicated to clients

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* from Moore et al, JAVMA 227:1102–1108, 2005

Feline Vaccine Adverse Events*

- Retrospective cohort study; 0.5 million cats vaccinated at 329 veterinary hospitals
- 51.6 adverse events per 10,000 cats vaccinated
- Inversely related to cat weight
- Increased for cats about 1 yr of age
- Greater for neutered versus sexually intact cats
- Increased as number of vaccines given together increased
- Lethargy with or without fever was most common sign

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* from Moore et al, JAVMA 231:94-100, 2007

Vaccine Conclusions for Felines*

- Factors that increase risk of adverse events 30 days after vaccination:
  - young adult age
  - Neutering
  - multiple vaccines given per visit
- These risks should be communicated to clients, and the number of vaccines administered concurrently limited

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*from Moore et al, JAVMA 231:94-100, 2007

Reasons for Vaccine Titer Testing

- To determine that animal is protected (suggested by a positive test result)
- To identify a susceptible animal (suggested by a negative test result)
- To determine whether an individual animal has responded to a vaccine
- To determine whether an individual vaccine is effectively immunizing animals

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* from: Schultz, Ford, Olsen, Scott. Vet Med, 97: 1-13, 2002 (insert)

Available Vaccine Titers for Dogs

- Distemper Virus
- Parvovirus
- Adenovirus 2 (hepatitis)
- Bordetella
- Leptospirosis
- Lyme disease
- Corona Virus [not recommended]
- Rabies Virus (RFFIT: non export)

Available Vaccine Titers for Cats

- Panleukopenia Virus
- Herpes Virus (Rhinotracheitis Virus)
- Calicivirus
- Rabies Virus (RFFIT: non export)

Available Vaccine Titers for Horses

- Equine Herpes (EHV –1, and – 4) (rhino)
- Potomac Horse Fever
- Equine Encephalitis (EEE, WEE, VEE)
- Equine Viral Arteritis
- Equine Influenza
- Rabies Virus (RFFIT: non export)
- West Nile Virus Antibody Titer

The Thimerosol-Free Rabies Vaccine

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www.rabieschallengefund.org