POST-VACCINE COMPLICATIONS

The benefit of vaccination of dogs and cats for serious disease outweigh the risk of complications. The U.K. did an Adverse Reaction Surveillance study from 1985. From 1995-1998, 3188 adverse reactions were reported. Of the 6-8 million vaccines given over that time period, the incidence of adverse reactions was deemed 0.004%.

The adverse events may be low but some precautions need to be made for animals with underlying disease or immune problems. The following conditions may be contraindicated for vaccination:

1. Genetic immunodeficiencies in Weimaraners and Akitas.
2. Acquired immunodeficiencies such as feline aids, feline leukemia, cancer, patients undergoing chemotherapy or on bone marrow suppressive drugs.
3. Immune-mediated disease such as uveitis, glomerulitis, polyarthritis, polyradiculoneuritis.
4. Immune-mediated disease of blood such as hemolytic anemia or thrombocytopenia.
5. Type 1 hypersensitivity vaccine reaction of dachshunds.
6. Any mild disease such as fever.
7. Pregnancy, lactation, in heat.
8. Vaccine-induced sarcoma.
9. Chronic feline ulcerative gingivostomatitis and faucitis.

HYPERSENSITIVITY IMMUNOLOGICAL COMPLICATIONS

TYPE I REACTION

Type I hypersensitivity is most commonly seen with rabies vaccine, coronavirus vaccine, feline leukemia, leptospira bacterin and parenteral Bordetella vaccine and sometimes parvoviral vaccines. Miniature dachshund puppies and other miniature breeds have a disproportionately high reaction rate.

In dogs, clinical signs include facial edema, itching, shock, weakness and vomiting with or without hemorrhagic diarrhea. Local or systemic reactions may occur in young puppies within 1-24 hours after the 2nd or 3rd vaccine and may result in death.

Cats show facial itching, drooling, vomiting, diarrhea, breathing difficulties usually within minutes to hours. Diarrhea, if it occurs, can persist for several days.

Following any vaccination, your pet should be kept indoors and observed for 1 hour after their vaccination.
Atopic dogs and cats should only be vaccinated when they are in a non-allergenic season or disease-free and not before an “allergy-shot” if they are on a desensitization program.

**TYPE II REACTION**
Autoimmune hemolytic anemia and non regenerative autoimmune anemia, transient thrombocytopenia can occur and this is one reason not to vaccinate on or around surgery dates as it promotes bleeding. Delay surgery for 2 weeks after vaccination.

Severe immune-mediated thrombocytopenia can occur 1-2 weeks after vaccination in some dogs.

**TYPE III REACTION**
Serum sickness syndrome. Deposition of immune complexes in the eye and can resolve spontaneously unless complications like glaucoma arise. This event occurs more with the canine adenovirus 1 vaccine (CAV-1).

Generalized serum sickness can cause widespread immune complex deposition onto the walls of the capillary beds in the kidneys and joints. This usually occurs after the administration of large amounts of hyperimmune serum or globulin and this is rarely done in dogs.

Glomerulonephritis and amyloidosis can occur in Akitas with repeated vaccinations. This occurs in humans and is one reason why people are not vaccinated annually as is done in veterinary practices.

**POLYRADICULONEURITIS**
Coonhound paralysis in dogs and Guillain-Barré syndrome (fibromyalgia) in humans. This is an immune-mediated inflammation of nerve roots seen after a variety of vaccines given to dogs or cats. Rapid and progressive weakness beginning in the hind legs and moving forward with pain sensation left intact. Recovery may take 4 weeks to several months or be incomplete.

**LOCAL REACTIONS**
Signs: pain, redness, swelling, irritation, loss of hair, change of hair coat and abscess formation.

Pain and swelling occurs within 30 minutes to 1-2 weeks after a vaccine. Local reactions that persist for 2-3 months after a vaccination should be needle aspirated or biopsied especially in cats to identify those patients developing injection site-associated sarcomas.
CONTAMINATION OF VACCINES, NEEDLES AND DIRTY HAIR COATS
Foreign bacteria may be injected but use of clean needles and better manufacturing technologies has minimized these events.

FOCAL CUTANEOUS GRANULOMATOUS REACTIONS AND ALOPECIA
Nodules can form where the vaccine was given and persist for 6 weeks. Dogs and cats with these reactions are at increased risk of having an anaphylaxis reaction with the next vaccine given. Breeds without undercoats, such as Bichon Frise, Poodle and Briard, may cause visible hyperpigmented alopecia macoules in the overlying dermis.

INJECTION SITE SARCOMA (ISS) IN CATS
Not only can vaccines cause sarcoma in cats, but any injections or absorbable suture can cause an inflammatory reaction that may lead to ISS. Dogs and people can develop ISS at injection sites as well, but it is very rare.

The reaction is due to reactive oxygen species from an injection in a genetically susceptible animal leading to malignant transformation of cells causing cancer. This may be fibrosarcoma, osteosarcoma, liposarcoma, malignant histiocytoma, rhabdomyosarcomas and chondrosarcoma. Tumours usually arise 3 months to 3½ years after a vaccination.

SYSTEMIC ILLNESS
Transient loss of appetite and lethargy can last 1-2 days after vaccination. Chlamydia vaccines can cause systemic illness in cats 1-3 weeks after vaccination with fever, lethargy, weakness, anorexia and stiffness.

NEUROLOGICAL COMPLICATIONS
Rabies vaccine-induced paralysis can begin in the inoculated limb 7 days after vaccination with modified live virus (MLV). MLV rabies is rarely used. Cats progress to near complete paralysis and dogs recover within 2½ -3 months. This is important for families traveling to Europe where the MLV may be used.

Encephalomyelitis has been reported with canine distemper vaccine if given in very young puppies or in immunocompromised dogs.

PRENATAL AND NEONATAL INFECTIONS
Vaccines given during pregnancy may cause fetal malformation or death and may cause infertility and abortion in the dam.
RESPIRATORY DISEASE
Intranasal vaccines can cause mild clinical signs of upper respiratory disease or produce a carrier state that may spread to other animals. Cats are at greater risk than dogs. Feline chronic ulcerative gingivostomatitis and faucitis likely caused by a hypersensitivity to the calicivirus and it is not recommended to vaccinate cats with calicivirus if they have gingivitis.

FEBRILE LIMPING SYNDROME OF CATS
May occur in kittens less than 6 months of age, occurring within 3 weeks of a vaccination. They are lame, feverish and may show respiratory signs. The lameness seems to move around from leg to leg. Some cats need fluid therapy support. Signs resolve in 3-4 days.

VACCINE ASSOCIATED DISEASE OF YOUNG AKITA DOGS
Akitas are highly inbred with a small gene pool so they are susceptible to developing immune-mediated polyarthritis anywhere from 3-30 days after a vaccine. They have fever, joint pain, elevated liver enzymes and anemia. Prognosis is poor for this breed and there is no treatment other than steroids and the disease is recurrent.

VACCINE ASSOCIATED HYPERTROPHIC OSTEOSDYSTROPHY (HOD) AND JUVENILE CELLULITIS OF WEIMARANERS
Characterized by fever, limb swelling and bony changes seen on radiographs, coughing, pneumonia, diarrhea, skin infections and oral ulcerations. The reaction usually occurs after the 2nd vaccine is given up to 1 month after a vaccine.

This syndrome may be seen in other large breed dogs and occasionally in small breed dogs.

SHEDDING OF VACCINE AGENTS
Virus may be shed in some animals through oral secretions if an intranasal is used, or through the feces or urine. This shedding can vaccinate other susceptible animals of the same species but can pose a risk to wildlife that come in contact with a vaccinated animal that is shedding a virus. There are no tests to help us identify which animal may pose a risk to others due to shedding post vaccination.

INFLUENCE ON DRUG METABOLISM
Vaccines can inhibit hepatic enzyme systems which may affect the metabolism of some drugs such as aminophylline, barbiturate, lidocaine, propranolol, chloramphenicol,
tylosin, griseofulvin and trimethoprim. There have been no studies performed to demonstrate this.

**IMMUNOSUPPRESSION**
Vaccination can cause immune suppression. If a pet has localized demodex, vaccination can allow the demodex to spread over the entire body.

If a pet is harboring salmonella subclinically, then a vaccine may cause the bowel infection to become clinical.

**HUMAN HEALTH RISK TO BORDATELLA BRONCHISEPTICA (Bb) INTRANASAL VACCINE**
Young children, the elderly and immunocompromised individuals (due to steroid use, chemotherapy or immunodeficiency virus) are susceptible to accidental spray of the bacterin in their face by their pet dog snorting after administration of the Bb bacterin. The risk occurs when a pet is held to have the bacterin administered. If any of the above situations apply, we prefer hospital personnel to hold your pet and for family members to leave the room when we use intranasal vaccines.