**MODULE 2: VACCINATIONS**

**Lesson 1: Canine Vaccines (Part One)**

[Note to Trainer: Current canine vaccination guidelines are available at www.aahanet.org.]

1) What do the vaccine abbreviations DHPPV and DHLPPV stand for?

[Note to Trainer: Some practices list these as DA2PPV or DA2LPPV where the A2 refers to adenovirus type 2 instead of using the term hepatitis. Some practices vaccinate against leptospirosis whereas others do not.]

**Answer: Distemper, hepatitis (or adeonovirus type 2), parainfluenza, and parvovirus.**

2) What are these vaccines for?

[Note to Trainer: Briefly describe each disease for any trainees with little or no veterinary background.]

**Answer: Distemper is an airborne virus that is often fatal. Distemper is highly contagious among dogs, ferrets, raccoons, wolves, coyotes, and mink, and it occurs most often in young animals. Dogs that do recover may be left with uncontrollable muscle or limb spasms and/or periodic convulsions. The distemper virus is seldom seen in suburban practices since the onset of widespread vaccination. Instead it is more common in rural or inner city areas, third-world countries, and wildlife. Clinical signs include high fever, mild respiratory problems such as runny eyes and nose, severe diarrhea, vomiting, and seizures. Hepatitis, caused by adenovirus type 2, is very contagious from dog to dog. It affects the liver, kidneys, lymph nodes, eyes, and other organs. Virus particles may be present in any body secretion and may be present in the urine for up to six to nine months. A bluish cast to the eyes may occur during recovery. This virus is seldom seen since the onset of widespread vaccination. Signs develop about one week after exposure and include high fever, loss of appetite, increased thirst, tonsillitis, and reddening of lining of mouth, throat, and eyelids. There may also be bloody diarrhea. Parvovirus is another highly contagious virus, and puppies are most susceptible. The virus is shed in stool. Unlike distemper and hepatitis, parvovirus is a common disease. Parainfluenza is a respiratory disease that causes signs of kennel cough.**

3) What is the vaccine schedule for an eight-week-old puppy? What vaccines does our practice recommend?

**Answer:**

4) Why is this schedule important?

[Note to Trainer: The goal of this question is to address the impact of **passive immunity** and to relay to the trainees why puppies need a series of vaccines in their first months of life.]

**Answer:**

5) At what age should a puppy begin the vaccine series?

*Sample Response: Eight weeks of age*

6) Is this age different for orphan puppies? If so, why?

*Sample Response: If puppies are orphaned and do not receive any* ***colostrum*** *then they will not have passive immunity and may require vaccines earlier in life.*

7) When should a pet NOT be vaccinated anymore?

*Sample Response: Pets may not require certain vaccines when a vaccine reaction has occurred, when a pet is diagnosed with a fatal disease, when the pet is no longer at-risk for the disease, or in old age.*

8) The breeder had the puppy vaccinated against DHPPV and *Bordetella* at six weeks of age. When will the puppy need to be vaccinated again and what vaccines will it receive?

**Answer:**

9) What is the vaccine schedule for an adult, unvaccinated dog for DHPPV?

**Answer:**

10) How frequently is the DHPPV administered after the initial series in puppies and adult, unvaccinated dogs?

**Answer:**

11) How does our practice decide which vaccines to recommend to which client?

[Note to Trainer: What are your hospital’s vaccine recommendations? When would a veterinarian deviate from the established protocol? When would additional vaccines be administered?]

**Answer:**

12) Why don’t we just vaccinate every dog for everything?

*Sample Response:* *Vaccines have risks and side effects, just like any other medical procedure. More is not necessarily better.* *The American Animal Hospital Association (AAHA) has issued vaccine recommendations (AAHA Canine Vaccine Task Force 2006). The AAHA recommendations have identified four “core” vaccines, which they believe every dog should receive, regardless of breed, region, or lifestyle. These vaccines are for distemper, parvovirus, adenovirus type 2, and rabies. Other vaccines, such as Bordetella, leptospirosis, and Lyme disease, should be given to dogs with risk for these diseases. These “non-core” vaccines are lifestyle or location based vaccines. Most would be given annually or according to manufacturer recommendations.*

13) Some veterinarians are recommended that adult dogs only require the DHPP once every three years. Why does our practice recommend? Why?

[Note to Trainer: Clients frequently ask this question. How would you like your team members to respond?]

**Answer:**

14) What is a **titer test**? How do you explain a titer test to a client?

*Sample Response: A titer test measures the antibody levels in a blood sample (e.g., antibodies against distemper or parvovirus). If the titer is high, then the dog is likely immune to the disease. If the titer is below a certain level, the pet will need another vaccine to boost their immunity.*

15) When might a titer test be performed?

*Sample Response: Some hospitals perform titer tests at the time of the annual wellness examination and only vaccinate animals when the titers are below a certain level indicating that protective immunity may have worn off. Alternatively, animals with nonlife-threatening hypersensitivities to a particular vaccine can have a titer test to ensure they are not vaccinated (and risk having a vaccine reaction) unnecessarily.*

16) What is leptospirosis and what are the symptoms?

[Note to Trainer: This is a good opportunity to discuss zoonotic diseases and how team members should protect themselves when handling biological samples.]

**Answer: Leptospirosis (lepto) is caused by the bacteria Leptospira interrogans. It is a spiral shaped bacteria that infects the kidneys or liver of the host animal. The bacterium is found in blood and other body tissues, is shed in the urine, and can survive for days or weeks in water or damp places. Animals contract the disease by consuming urine-contaminated food, or water. L. interrogans is carried by many animals including deer, raccoons, rats, foxes, etc. Leptospirosis is also a zoonotic disease (i.e., humans can get it). Clinical signs of disease usually develop within four to fourteen days postexposure and it is most commonly diagnosed in the fall. L. interrogans can cause acute, severe liver or kidney failure, or sudden death in the peracute form. There can also be subclinical infections, chronic infections, or inapparent carriers of the disease who are contagious to others without showing any evidence of infection themselves. There are multiple serovars (strains) of the bacterium that can cause disease and vaccines are not available against all strains.**

17) Does our practice routinely vaccinate against leptospirosis?

[Note to Trainer: If you do, discuss the possibility of vaccination reactions and what those look like. It is also important to address the fact that the leptospirosis vaccine can “wear off” more quickly than other vaccines necessitating boosters more frequently.]

**Answer:**

18) What is a *Leptospira* strain?

[Note to Trainer: Ensure that trainees realize that vaccinated dogs can still get leptospirosis.There are multiple **serovars** (strains) that can cause disease, and vaccines are not available against all strains.]

**Answer:**

19) What breeds are particularly prone to parvovirus?

**Answer: Dobermans, Rottweilers, and pit bulls appear to be more susceptible to parvovirus infections.**

20) Does our practice change the vaccine protocol these breeds?

[Note to Trainer: Some practices administer an extra parvovirus booster after 16 weeks of age (after the initial vaccine series) and annual boosters thereafter.]

**Answer:**

21) Describe the clinical signs of parvovirus.

**Answer: Severe and often bloody vomiting and diarrhea are some signs. Other signs include dehydration, fever, and a low white-blood-cell count. Parvovirus can attack the heart muscle and cause sudden death in very young puppies.**

22) How long is an infected puppy or dog contagious?

**Answer: While the animal is only contagious for 10 to 14 days, any virus shed during their illness can survive for months in the environment. It is important that trainees know to tell the client that they shouldn’t take the pet on walks or to the dog park for at least two weeks after the pet recovers and that any stools in their yard or local parks, etc., can continue to transmit the virus for a long time. This is also an important reason that it is not recommended to take young puppies to dog parks and risk exposure to infectious diseases before they are fully vaccinated.**

23) What disinfectants can be used to kill parvovirus?

[Note to Trainer: It is important to address not only the appropriate products, but also the correct use of these products. For example, organic material must first be removed from the surface before applying the disinfectant or the disinfectant won’t work. Also, disinfectants must soak for a few minutes to kill viruses and bacteria. You can’t just spray and wipe. Explain how hard disinfecting can be and discuss **passive transport**, **fomites**, and isolation protocols. Solutions must be mixed according to directions to work properly. This might be a good opportunity to discuss the importance of routinely using appropriate hand hygiene.]

*Sample Response: Bleach, phenolics, some quaternary ammonium products*

24) What is coronavirus?

[Note to Trainer: The 2006 AAHA Canine Vaccine Guidelines no longer recommend routine vaccination against coronavirus.]

**Answer:**

25) How can puppies be distracted while they are being vaccinated?

*Sample Response: Distract young pets with something tasty to eat. If they are using their senses of taste and smell, young animals are less likely to notice the needle injection.*

26) How can you train the puppy and client to behave appropriately during vaccination appointments to minimize fear and stress?

**Answer:**

**MODULE 2: VACCINATIONS**

**Lesson 2: Canine Vaccines (Part Two)**

1) How is the *Bordetella* vaccine administered?

[Note to Trainer: Discuss **nasalgen** versus the injectable formulations.]

**Answer:**

2) At what age is the *Bordetella* vaccine administered?

**Answer:**

3) How long does the *Bordetella* vaccine last? How frequently should a dog be revaccinated against *Bordetella*?

**Answer:**

4) If a dog travels frequently to dog shows, do you recommend additional vaccinations? Which vaccines and how often are they administered?

**Answer:**

5) What other vaccines are available for dogs?

**Answer:**

6) Where on the body (anatomic location) is the rabies vaccine administered and why?

**Answer:**

7) How long does the initial rabies vaccination last?

**Answer:**

8) Will this time period change based on the age of the pet?

**Answer:**

9) How long do subsequent rabies vaccinations last?

[Note to Trainer: The answer to this question will vary from state-to-state and vaccine-to-vaccine. Make sure trainees know that if a pet is traveling to another state or moving here from somewhere else we need to think about duration of immunity (DOI) regulations in that state.]

**Answer:**

10) When does our practice recommend vaccinating against the following diseases?

A) Lyme disease

**Answer:**

B) *Bordetella*

**Answer:**

C) Others

**Answer:**

11) How many boosters are required for Lyme disease initially and at what interval? When is the dog revaccinated after the initial series?

**Answer:**

12) When should a dog be tested for Lyme disease?

**Answer:**

13) Will the vaccine interfere with the test for Lyme disease?

[Note to Trainer: If performing the test in-house, check the Lyme disease test kit’s package insert before testing.]

**Answer: Not usually**

14) If a dog is vaccinated against Lyme disease, why do they still need a tick preventative?

[Note to Trainer: What would you like your team members to say when they are asked this question?]

**Answer:**

15) How effective is the Lyme vaccine?

[Note to Trainer: This information can be found in the vaccine’s package insert or the manufacturer’s website.]

**Answer:**

16) How effective is the Giardiavaccine?

*Sample Response: According to the 2006 AAHA Canine Vaccine Guidelines, the Giardia vaccine may prevent oocyst shedding but does not prevent infection. Routine vaccination against Giardia is not recommended.*

17) What is the minimum age at which we vaccinate against the following diseases?

A) Lyme disease

*Sample Response: 12 weeks*

B) Rabies

*Sample Response: 12 weeks (may vary from state-to-state)*

18) How does the *Porphyromonas sp.* (periodontal disease) vaccine work? Does our practice recommend this vaccine?

**Answer:**

19) How many boosters of the *Porphyromonas sp.* vaccine are required?

**Answer: Two injections approximately one month apart**

**MODULE 2: VACCINATIONS**

**Lesson 3: Feline Vaccines (Part One)**

[Note to Trainer: See the American Association of Feline Practitioners 2006 Vaccination Guidelines for assistance in this section.]

1) What diseases are included in the FVRCP or FVRCCP vaccination?

**Answer: Feline viral rhinotracheitis, calicivirus, and panleukopenia. Chlamydia is the second C in some vaccines.**

2) What are the clinical signs of these diseases?

[Note to Trainer: Describe these diseases for any trainees new to veterinary medicine.]

**Answer: Panleukopenia (feline distemper) is caused by a virus that is shed in body secretions. Clinical signs include leukopenia, high fever, anorexia, vomiting, green gooey diarrhea, and dehydration. This infection is most common in young kittens and is an often-fatal disease (even in adult cats with no prior exposure). Rhinotracheitis (i.e., feline viral rhinotracheitis) is caused by a virus transmitted via aerosols. Clinical signs include fever, sneezing, coughing, nasal discharge, and conjunctival exudate. Calicivirus is caused by a virus that is transmitted in oropharyngeal fluids. It is a very hardy virus, easily transmitted by fomites. Clinical signs include fever, anorexia, mucosal ulceration (oral ulcers), and serous nasal discharge. Chlamydia is caused by a bacterium that is transmitted through oculonasal secretions. Clinical signs include conjunctivitis, squinting, congestion, weepy eyes, sneezing, and a serous nasal discharge.**

3) What is an upper respiratory tract infection (URTI)?

**Answer: All of the diseases in the FVRCP vaccination cause upper respiratory tract infections.**

4) How can our team members protect healthy cats and kittens from becoming infected by a virus transmitted from a sick cat examined in your hospital?

[Note to Trainer: As with contagious canine diseases, if the client calls and tells the CCR the cat is lethargic, sneezing, and has diarrhea, she needs to know it is an urgent appointment.]

*Sample Response: The cat should be placed in an examination room immediately upon arrival instead of sitting in the waiting room. The assistants need to know to clean the examination room properly and that the room should not be used to examine other cats until the room is fully disinfected. Proper hand washing is essential or the virus will end up on inanimate objects that you touch.*

5) How long does the feline distemper virus survive in the environment?

**Answer: The feline distemper virus is extremely hardy. It can last a year indoors at room temperature. It survives freezing as well as treatment with such common disinfectants as alcohol and iodine. If all the barn cats die of distemper and the client asks you if they can get more cats, any newcomers should be fully vaccinated first, or they’ll get sick and die even years later.**

6) How effective is the vaccine against feline distemper?

**Answer: The feline distemper vaccine is one of the most effective vaccines available.**

7) At what age should a kitten be vaccinated?

**Answer:**

8) What is the difference between the FVRCP **nasalgen** and the injectable version?

[Note to Trainer: Read the vaccine package inserts for specific data about the vaccines that your hospital uses.]

**Answer:**

9) Does our practice stock or recommend the nasalgen distemper vaccination?

**Answer:**

10) What is VS-FCV? How would you explain it to a client?

*Sample Response: New strains of calicivirus are appearing in animal shelters all across the United States. Some of these new viral strains are much more dangerous than the older strains. This new form of calicivirus is called virulent systemic feline calicivirus (VS-FCV). These strains can affect multiple organs in the body and can kill healthy adult cats within 24 to 48 hours. Sixty percent of adult cats and 20% of kittens that contract the disease die. Those that survive can take weeks to recover.*

11) Does our practice vaccinated against VS-FCV?

**Answer:**

12) How effective is vaccination against rhinotracheitis? How do we explain to a client why their vaccinated cat can still develop the disease?

*Sample Response: Rhinotracheitis is a herpesvirus that can result in a persistently infected cat. A previously infected cat can experience recurrence of the disease (e.g., during times of stress). The goal of the rhinotracheitis vaccine is minimize the occurrence and severity of flare-ups, not to eradicate the disease.*

13) What health problem associated with rhinotracheitis occurs in adult cats?

**Answer: Corneal ulcers**

14) How does our kitten vaccination protocol compare to our puppy vaccination protocol?

**Answer:**

15) How often are adult cats vaccinated with the FVRCP vaccine and why?

**Answer:**

16) Are vaccine titers performed in cats?

**Answer:**

17) Where on the body (anatomic location) is the FVRCCP vaccine administered?

**Answer:**

18) What is an **adjuvant**? Why is this important and how do you explain an adjuvant to a client?

[Note to Trainer: Does your practice use nonadjuvanted feline vaccines?]

*Sample Response: Adjuvants are chemicals that stimulate the immune system to respond more strongly to the vaccine. They often make the vaccine more effective or longer lasting, but also increase the risk for adverse vaccine reactions.*

19) How long does an initial rabies vaccination last in a cat?

**Answer:**

20) How long do subsequent rabies vaccinations last?

[Note to Trainer: Do you use the one or three year rabies vaccine? What are your state and local regulations regarding rabies vaccination in cats?]

**Answer:**

21) Why do indoor cats need to be vaccinated against rabies?

*Sample Response: Bats and other wildlife can enter your home or a cat can escape outside. A rabies vaccine may be required for pet insurance or a pet license. A rabies vaccine ensures that the people handling your cat (e.g., veterinary staff, visitors to your home) will not get infected.*

22) Where on the body (anatomic location) is the rabies vaccination administered?

**Answer:**

**MODULE 2: VACCINATIONS**

**Lesson 4: Feline Vaccines (Part Two)**

1) What is FeLV?

**Answer: Feline leukemia is a retrovirus that suppresses the cat’s immune system. It can eventually cause leukemia, lymphoma, non-regenerative anemia, or reproductive disorders. Secondary symptoms due to the depressed immune system include chronic mouth and gum infections, skin and ear infections, chronic respiratory disease, intestinal infection. Some cats can be coinfected with feline immunodeficiency virus (FIV) or feline infectious peritonitis (FIP).**

2) How is FeLV transmitted?

[Note to Trainer: Do you have the same worries about transmission and cleaning/disinfecting the clinic and examination rooms for cats diagnosed with FeLV compared to cats diagnosed with feline distemper or calicivirus?]

**Answer: FeLV is transmitted through blood or saliva. Transmission requires close contact (e.g., fighting, mating) It can also be passed from mothers to kittens *in utero*. The virus does not survive long outside a host and is easily killed by drying or cleaning.**

3) At what age are kittens tested for FeLV?

**Answer:**

4) Which cats/kittens should be tested for FeLV?

[Note to Trainer: Does your practice follow the American Association of Feline Practitioners’ guidelines for testing?]

**Answer:**

5) What is FIV? Is there a test for FIV?

**Answer: FIV is feline immunodeficiency virus (feline or cat AIDS) that suppresses the immune system. Cats infected with FIV can live long lives, but still carry and can transmit the virus. Clinical signs include fever and enlarged lymph nodes, weight loss, chronic secondary infections such as gingivitis and stomatitis, tumor development, anemia, and neurologic abnormalities. There is no cure for FIV. Just like FeLV, an enzyme-linked immunosorbant assay (ELISA test) is widely available.**

6) What does FIP stand for?

[Note to Trainer: How much time you dedicate to FIP will depend on how frequently this disease is diagnosed in your hospital.]

**Answer: Feline Infectious Peritonitis**

7) What are the clinical signs of FIP?

[Note to Trainer: This might be a good opportunity to discuss differences in testing between FeLV/FIV and FIP.]

**Answer: There are two forms of FIP: the wet form and the dry form. The wet form causes fluid accumulation in the abdomen and/or chest whereas the dry form causes microabscesses to form around affected organs and impair organ function. Both forms cause a low-grade, often intermittent fever. FIP is always fatal once symptoms appear.**

8) How is FIP transmitted?

**Answer: Cats become infected by inhaling or ingesting the Feline Corona virus (FCoV). FIP is common in catteries and shelters and is difficult to control. Only 5% of cats infected with FCoV actually get FIP.**

9) How long does FCoV survive in the environment?

**Answer: Several months**

10) How are the examination room and cages cleaned/disinfected to avoid the spread of contagious feline diseases?

**Answer:**

11) Does our hospital recommend vaccinating against the following?

A) FeLV

**Answer:**

B) FIV

**Answer:**

C) FIP

**Answer:**

12) How many times are kittens vaccinated against FeLV?

**Answer:**

13) How many times are kittens vaccinated against FIV?

**Answer:**

14) At what age are kittens first vaccinated against FIV and FeLV?

**Answer:**

15) Does our hospital use FVRCCP-FeLV combination vaccines? Why or why not?

**Answer:**

16) What FeLV vaccination does our hospital use and why?

**Answer:**

**MODULE 2: VACCINATIONS**

**Lesson 5: Vaccine Protocols**

1) What vaccines are administered to ferrets? How often?

**Answer:**

2) What vaccinations are required before a dog is permitted to enter our hospital for boarding or elective surgery?

**Answer:**

3) What vaccinations are required before a cat is permitted to enter our hospital for boarding or elective surgery?

**Answer:**

4) How long after the pet has been fully vaccinated can she or he be admitted for boarding or elective surgery?

**Answer:**

5) In an adult cat, what is the quickest vaccine schedule available to expedite the spaying/neutering process?

**Answer:**

6) What vaccinations are required for a dog to travel to Florida?

[Note to Trainer: Florida is an example because of its unique policy, which team members should be aware of. Where do team members look to find out what vaccinations or other treatments/records are required to travel either nationally or internationally?]

**Answer:**

7) How many vaccines can be administered at one time? Is there a limit?

[Note to Trainer: Vaccines are tested one at a time on healthy animals. There are no controlled studies that demonstrate it is safe to administer two, three, or four vaccines at once. Does your practice have a limit?]

**Answer:**

8) If you limit the number of vaccines, do the combination vaccines (e.g., FVRCCP-FeLV) count as one, two, or more vaccinations?

**Answer:**

9) What does a vaccine reaction look like? How quickly can a vaccine reaction develop?

[Note to Trainer: If a client calls to report clinical signs of a vaccine reaction, what should the CCR do? What is your standard treatment protocol and how do you charge for treating animals with vaccine reactions? Who is the reaction reported to?]

**Answer:**

10) Which canine vaccine is most frequently associated with vaccine reactions?

*Sample Response: Leptospirosis is a common vaccine thought to cause vaccine reactions but a reaction can occur following the administration of ANY vaccine.*

11) What are our hospital’s recommendations for vaccinating animals that have had a reaction?

**Answer:**

12) Is it safe to vaccinate a pregnant pet?

**Answer:**

13) Is it safe to vaccinate a nursing mother?

**Answer:**

14) What might an owner notice about their pet following a routine vaccine appointment?

[Note to Trainer: Does your team advise owners that the pet may be lethargic, sore at the injection site, or may not eat as well the next day? When should an owner call if they are concerned?]

**Answer:**

15) How are minor vaccine reactions treated?

*Sample Response: Usually with nonsteroidal antiinflammatory drugs (NSAIDs) and sometimes fluids are required.*

16) What other reactions can occur?

*Sample Response: A lump at the site of the injection might be noted or the animal may sneeze after administration of a nasalgen. The “worst case scenario” is* **anaphylaxis***, which is the most severe form of allergy and potentially life threatening.*

17) Is it safe to give a sick pet a vaccine? Why or why not?

*Sample Response: In general, vaccinating animals diagnosed with a parasitic infestation or infectious disease, animals that just underwent surgery, or animals that are scheduled for surgery is not recommended (Roth 2007).*

18) What is a vaccine-associated sarcoma? How common are these?

**Answer: In 1991, veterinarians began to notice a higher than expected number of sarcomas (a cancerous tumor) occurring in cats at places where vaccines are commonly injected. Subsequently, an association between vaccine administration and sarcoma development has been established. In both cats and dogs, it is not uncommon for a small, firm, painless swelling to form under the skin at the site where a vaccine was injected but only one in 5,000 to 10,000 cats develop a sarcoma.**

19) How can our practice reduce the risk of developing vaccine-associated sarcomas?

[Note to Trainer: Explain the use of **nasalgen** vaccines.]

**Answer:**

20) When should the owner worry about a lump and call the veterinary office?

*Sample Response: AAFP Guidelines recommend biopsy if the mass is present three months after vaccination, the mass is greater than or equal to 2 cm in diameter, the mass is increasing in size after one month.*

21) Is it less expensive to vaccinate a pet while it is already in the hospital for boarding, grooming, or a day procedure compared to making a separate appointment? If so, by how much?

**Answer:**

22) What pets are most likely to yelp or cry when vaccinated?

**Answer: Young pets**

23) Do all of our veterinarians routinely administer vaccines in the same anatomic location on each pet?

**Answer:**

24) Is the anatomic location where each vaccine was administered indicated in the medical record?

**Answer:**

**Module 2 Suggested Reading**

American Animal Hospital Association (AAHA) Canine Vaccine Task Force. 2006. 2006 AAHA canine vaccine guidelines. *Journal of the American Animal Hospital Association* 42:80-9.

https://www.aaha.org/professional/resources/canine\_vaccine.aspx

American Association of Feline Practitioners. 2006 AAFP Feline Vaccination Guidelines.

http://www.catvets.com/uploads/PDF/2006\_Vaccination\_Guidelines\_JAVMA.pdf

American Association of Feline Practitioners and Academy of Feline Medicine Advisory Panel Report of Feline Retrovirus Testing and Management. http://beta.catvets.com/uploads/PDF/Felv\_FIV\_Guidelines.pdf

American Veterinary Medical Association Vaccine-Associated Feline Sarcoma Task Force. http://www.avma.org/vafstf/rbbroch.asp