

# Feline Vaccination Protocols

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## 필수, 비필수 그리고 일반적으로 추천되지 않는 백신들

- 필수백신(Core vaccines)은 모든 고양이들에게 반드시 맞춰주어야 합니다. 전염력이 강하고 생명을 위협할 수 있는 질병들입니다. 또한 사람에게 옮길 수 있는 인수공통전염병도 포함됩니다. 발병률이 높고, 쉽게 전염되며,接种의 효과가 비교적 높습니다. Feline Parvovirus, Feline Herpes-1, Feline Calicivirus 그리고 Rabies virus가 포함됩니다.



- 비필수백신(Noncore vaccines)은 특별한 상황에서 위험성이 있는 백신들입니다. 위험도의 실제적인 평가와 접종의 효과와 안전성을 고려한 후 접종하게 됩니다. Feline Leukemia virus, Feline Immunodeficiency virus, Chlamydomphila felis 그리고 Bordetella bronchiseptica 등이 포함됩니다.
- 일반적으로 추천되지 않는 백신들은 발병률이 극히 낮거나, 효과가 적은 백신들입니다. Feline Infectious Peritonitis, Giardia spp 등이 포함됩니다.

Table 1—Feline vaccines currently available in the United States.

FPV		Description						
Brand name	Company	FPV	Adjuvant	Route of administration				
ContinuumFelineP*	IntervetInc	MLV	No	Injection				
Felocell P	Pfizer AnimalHealth	MLV	No	Injection				
Panagen	Schering-PloughAnimalHealth	K	No	Injection				
FCV and FHV-1		Description						
Brand name	Company	FCV	FHV-1	Adjuvant	Route of administration			
Feline UltraNasal FVRC	Heska Corp	MLV	MLV	No	IN only			
ContinuumFeline HC*	IntervetInc	MLV	MLV	No	Injection			
PUREVAX Feline Respiratory 2	Merial Ltd	MLV	MLV	No	Injection			
Felocell FVR C	Pfizer AnimalHealth	MLV	MLV	No	Injection			
Felocell FVR C (IN)	Pfizer AnimalHealth	MLV	MLV	No	IN only			
FVR C	Schering-PloughAnimalHealth	MLV	MLV	No	Injection			
FCV, FHV-1, and Chlamydomphila felis		Description						
Brand name	Company	FCV	C felis	FHV-1	Adjuvant	Route of administration		
PUREVAX Feline Respiratory 3	Merial Ltd	MLV	AL	MLV	No	Injection		
Felocell FVR C Ch	Pfizer AnimalHealth	MLV	AL	MLV	No	Injection		
FPV, FCV, and FHV-1		Description						
Brand name	Company	FPV	FCV	FHV-1	Adjuvant	Route of administration		
Fel-O-GuardPlus 3	Fort DodgeAnimalHealth	MLV	MLV	MLV	No	Injection		
Fel-O-Vax PCT	Fort DodgeAnimalHealth	K	K	K	Yes	Injection		
Feline UltraNasal FVRCP	Heska Corp	MLV	MLV	MLV	No	IN only		
ContinuumFeline HCP*	IntervetInc	MLV	MLV	MLV	No	Injection		
Protex-3	IntervetInc	MLV	MLV	MLV	No	Injection		
PUREVAX Feline 3	Merial Ltd	MLV	MLV	MLV	No	Injection		
Felocell 3	Pfizer AnimalHealth	MLV	MLV	MLV	No	Injection		
Eclipse 3	Schering-PloughAnimalHealth	MLV	MLV	MLV	No	Injection		
FVR C-P	Schering-PloughAnimalHealth	K	MLV	MLV	No	Injection		
FPV, FCV, FHV-1, and rabies virus		Description						
Brand name	Company	FPV	FCV	FHV-1	Rabies	Adjuvant	Route of administration	
ContinuumFeline HCP + R*	IntervetInc	MLV	MLV	MLV	K	Yes	Injection	
PUREVAX Feline 3/Rabies	Merial Ltd	MLV	MLV	MLV	V	No	Injection	
FPV, FCV, FHV-1, and FeLV		Description						
Brand name	Company	FPV	FCV	FHV-1	FeLV	Adjuvant	Route of administration	
Fel-O-GuardPlus 3+Lv-K	Fort DodgeAnimalHealth	MLV	MLV	MLV	K	Yes	Injection	
Fel-O-Vax Lv-K III	Fort DodgeAnimalHealth	K	K	K	K	Yes	Injection	
Eclipse 3+FeLV	Schering-PloughAnimalHealth	MLV	MLV	MLV	K	Yes	Injection	
FPV, FCV, FHV-1, and C felis		Description						
Brand name	Company	FPV	FCV	FHV-1	C felis	Adjuvant	Route of administration	
Fel-O-GuardPlus 4	Fort DodgeAnimalHealth	MLV	MLV	MLV	K	Yes	Injection	
Fel-O-Vax IV	Fort DodgeAnimalHealth	K	K	K	K	Yes	Injection	
Protex-4	IntervetInc	MLV	MLV	MLV	AL	No	Injection	
PUREVAX Feline 4	Merial Ltd	MLV	MLV	MLV	AL	No	Injection	
Felocell 4	Pfizer AnimalHealth	MLV	MLV	MLV	AL	No	Injection	
Eclipse 4	Schering-PloughAnimalHealth	MLV	MLV	MLV	AL	No	Injection	
FPV, FCV, FHV-1, C felis, and rabies virus		Description						
Brand name	Company	FPV	FCV	FHV-1	C felis	Rabies	Adjuvant	Route of administration
PUREVAX Feline 4/Rabies	Merial Ltd	MLV	MLV	MLV	AL	V	No	Injection
FPV, FCV, FHV-1, C felis, and FeLV		Description						
Brand name	Company	FPV	FCV	FHV-1	C felis	FeLV	Adjuvant	Route of administration
Fel-O-GuardPlus 4+Lv-K	Fort DodgeAnimalHealth	MLV	MLV	MLV	K	K	Yes	Injection
Fel-O-Vax Lv-K IV	Fort DodgeAnimalHealth	K	K	K	K	K	Yes	Injection
Eclipse 4+FeLV	Schering-PloughAnimalHealth	MLV	MLV	MLV	AL	K	Yes	Injection



Table 1—Feline vaccines currently available in the United States (continued).

FeLV		Description					
Brand name	Company	FeLV	Adjuvant			Route of administration	
FeI-O-Vax LV-K	Fort Dodge Animal Health	K	Yes			Injection	
PUREVAX Recombinant Leukemia	Merial Ltd	V	No			Transdermal only†	
Leukocell 2	Pfizer Animal Health	K	Yes			Injection	
Fevaxyn FeLV	Schering-Plough Animal Health	K	Yes			Injection	
<b>FIP</b>							
Brand name	Company	Description	Adjuvant			Route of administration	
Felocell FIP (IN)	Pfizer Animal Health	MLV	No			IN only	
<b>Bordetella bronchiseptica</b>							
Brand name	Company	Description	Adjuvant			Route of administration	
Protex Bb‡	Intervet Inc	AL	No			IN only	
Continuum Feline Bb‡	Intervet Inc	AL	No			IN only	
<b>C felis</b>							
Brand name	Company	Description	Adjuvant			Route of administration	
Continuum Feline Cp	Intervet Inc	AL	No			Injection	
<b>Giardia lamblia</b>							
Brand name	Company	Description	Adjuvant			Route of administration	
FeI-O-Vax Giardia	Fort Dodge Animal Health	K	Yes			Injection	
<b>FIV</b>							
Brand name	Company	Description	Adjuvant			Route of administration	
FeI-O-Vax FIV	Fort Dodge Animal Health	K	Yes			Injection	
<b>FeLV and FIV</b>							
Brand name	Company	Description	Adjuvant			Route of administration	
FeI-O-Vax LVK/FIV	Fort Dodge Animal Health	K	Yes			Injection	
<b>Rabies virus</b>							
Brand name	Company	Type	1 year	3 year	4 year	Adjuvant	Route of administration
Rabvac 1	Fort Dodge Animal Health	K	X			Yes	Injection
Rabvac 3	Fort Dodge Animal Health	K		X		Yes	Injection
Rabvac 3 TF	Fort Dodge Animal Health	K		X		Yes	Injection
Continuum Rabies	Intervet Inc	K			X§	Yes	Injection
Prorab-1	Intervet Inc	K	X			Yes	Injection
Imrab 1	Merial Ltd	K	X			Yes	Injection
Imrab 1 TF	Merial Ltd	K	X			Yes	Injection
Imrab 3 TF	Merial Ltd	K		X		Yes	Injection
Imrab 3	Merial Ltd	K		X		Yes	Injection
PUREVAX Feline Rabies	Merial Ltd	V	X			No	Injection
Defensor 1	Pfizer Animal Health	K	X			Yes	Injection
Defensor 3	Pfizer Animal Health	K		X		Yes	Injection
Rabdomun1	Schering-Plough Animal Health	K	X			Yes	Injection
Rabdomun	Schering-Plough Animal Health	K		X		Yes	Injection

\*This product is labeled for use every 3 years. Use in this manner is supported by challenge data.<sup>22</sup> †Administration by use of Vetjet device only. ‡Protex Bb and Continuum Bb are the same product but sold under different labels. §This product carries a 4-year label for cats; in states and municipalities in which feline rabies vaccination is required, veterinarians must follow applicable statutes.  
 K = Killed virus. V = Vectored recombinant. AL = Avirulent live.

Table 2—Summary of vaccination of cats in general practice.

Vaccine	Primary series: kittens (≤ 16 weeks old)	Primary series: adolescent/adult (> 16 weeks old)	Booster	Comments
Panleukopeniavirus (FPV) MLV, nonadjuvanted Injectable	Begin as early as 6 weeks of age, then every 3 to 4 weeks until 16 weeks of age.	Administer 2 doses, 3 to 4 weeks apart.	A single dose is given 1 year following the last dose of the initial series, then no more frequently than every 3 years.	Core • Use of MLV vaccines is not recommended in pregnant cats, kittens < 4 weeks of age, and FeLV- or FIV-infected cats.
FPV Killed virus, adjuvanted Killed virus, nonadjuvanted Injectable	Begin as early as 6 weeks of age, then every 3 to 4 weeks until 16 weeks of age.	Administer 2 doses, 3 to 4 weeks apart.	A single dose is given 1 year following the last dose of the initial series, then no more frequently than every 3 years.	Core • Killed virus vaccines are generally preferred for use in pregnant cats (and only if absolutely necessary) and in FeLV- or FIV-infected cats. • Killed virus vaccines may be more appropriate in disease-free colonies because there is no risk of spread or reversion to virulence.
FPV MLV, nonadjuvanted IN <sup>b</sup>	Begin as early as 6 weeks of age, then every 3 to 4 weeks until 16 weeks of age.	Administer 2 doses, 3 to 4 weeks apart.	A single dose is given 1 year following the last dose of the initial series, then no more frequently than every 3 years.	Core • Intranasal vaccination may not be as effective as injectable vaccination in high-risk environments in which exposure thereafter may occur soon after vaccination and is not recommended for routine use in kittens housed in shelter environments.
FHV-1 and FCV MLV, nonadjuvanted Injectable	Begin as early as 6 weeks of age, then every 3 to 4 weeks until 16 weeks of age.	Administer 2 doses, 3 to 4 weeks apart.	A single dose is given 1 year following the last dose of the initial series, then every 3 years. <sup>c</sup>	Core • MLV FHV-1 and FCV vaccines are invariably combined with each other, either as bivalent products or in combination with additional vaccine antigens.
FHV-1 and FCV Killed virus, adjuvanted <sup>d</sup> Injectable	Begin as early as 6 weeks of age, then every 3 to 4 weeks until 16 weeks of age.	Administer 2 doses, 3 to 4 weeks apart.	A single dose is given 1 year following the last dose of the initial series, then every 3 years. <sup>c</sup>	Core • Killed virus FHV-1 and FCV vaccines are invariably combined with each other, either as bivalent products or in combination with additional vaccine antigens. • Killed virus vaccines are generally preferred for use in pregnant cats (and only if absolutely necessary) and in FeLV- or FIV-infected cats. • Killed virus vaccines may be more appropriate in disease-free colonies because there is no risk of spread or reversion to virulence.
FHV-1 and FCV MLV, nonadjuvanted IN	Begin as early as 6 weeks of age, then every 3 to 4 weeks until 16 weeks of age.	Administer 2 doses, 3 to 4 weeks apart.	A single dose is given 1 year following the last dose of the initial series, then every 3 years. <sup>c</sup>	Core • Clinical signs of URD are more commonly seen following IN vaccination. • FHV-1/FCV vaccines for IN administration are invariably combined with each other, either as bivalent products or in combination with FPV.



Table 2—Summary of vaccination of cats in general practice (continued).

Vaccine	Primary series: kittens (≤ 16 weeks old)	Primary series: adolescent/adult (> 16 weeks old)	Booster	Comments
Rabies virus <sup>a</sup> Canarypoxvirus-vectored recombinant (rRabies), nonadjuvanted Injectable	Administer a single dose as early as 8 weeks of age, with revaccination 1 year later.	Administer 2 doses, 12 months apart.	Annual booster is required.	Core <ul style="list-style-type: none"> <li>• In states and municipalities in which feline rabies virus vaccination is required, veterinarians must follow applicable statutes.</li> <li>• Booster vaccination with a 1-year rabies virus vaccine is only appropriate in states and municipalities where permitted by law.</li> <li>• Any rabies virus vaccine can be used for revaccination, even if the product is not the same brand previously administered.</li> </ul>
Rabies virus <sup>a</sup> 1-year killed virus, adjuvanted Injectable	Administer a single dose as early as 12 weeks of age, with revaccination 1 year later.	Administer 2 doses, 12 months apart.	Annual booster is required.	Core <ul style="list-style-type: none"> <li>• In states and municipalities in which feline rabies virus vaccination is required, veterinarians must follow applicable statutes.</li> <li>• Booster vaccination with a 1-year rabies virus vaccine is only appropriate in states and municipalities where permitted by law.</li> <li>• Any rabies virus vaccine can be used for revaccination, even if the product is not the same brand previously administered.</li> </ul>
Rabies virus <sup>a</sup> 3-year killed virus, adjuvanted Injectable	Administer a single dose as early as 12 weeks of age, with revaccination 1 year later.	Administer 2 doses, 12 months apart.	Every 3 years or as required by state or local ordinance.	Core <ul style="list-style-type: none"> <li>• In states and municipalities in which feline rabies virus vaccination is required, veterinarians must follow applicable statutes.</li> <li>• Any rabies virus vaccine can be used for revaccination, even if the product is not the same brand previously administered.</li> <li>• No laboratory or epidemiologic data exist to support the annual or biennial administration of 3-year vaccines following the initial series.</li> </ul>
FeLV Canarypoxvirus-vectored recombinant (rFeLV), nonadjuvanted Transdermal	Administer an initial dose as early as 8 weeks of age; a second dose should be administered 3 to 4 weeks later.	Administer 2 doses, 3 to 4 weeks apart.	When indicated, a single dose is given 1 year following the last dose of the initial series, then annually in cats determined to have sustained risk of exposure. <sup>1</sup>	Noncore <ul style="list-style-type: none"> <li>• Booster inoculation is recommended only in cats considered to be at risk of exposure.<sup>1</sup></li> <li>• FeLV vaccination is highly recommended for all kittens.</li> <li>• In the United States, the 0.25-mL rFeLV vaccine dose may only be administered via the manufacturer's transdermal administration system.<sup>2</sup></li> <li>• Only cats testing negative for FeLV should be vaccinated; FeLV testing prior to vaccine administration is recommended.</li> <li>• Cats should be tested for FeLV infection before their initial vaccination and when there is a possibility that they have been exposed to FeLV since they were last vaccinated.</li> </ul>

Table 2—Summary of vaccination of cats in general practice (continued).

Vaccine	Primary series: kittens (≤ 16 weeks old)	Primary series: adolescent/adult (> 16 weeks old)	Booster	Comments
<p>FeLV Killed virus, adjuvanted Injectable</p>	<p>Administer an initial dose as early as 8 weeks of age; a second dose should be administered 3 to 4 weeks later.</p>	<p>Administer 2 doses, 3 to 4 weeks apart.</p>	<p>When indicated, a single dose is given 1 year following the last dose of the initial series, then annually in cats determined to have sustained risk of exposure.<sup>1</sup></p>	<p>Noncore</p> <ul style="list-style-type: none"> <li>• Booster inoculation is recommended only in cats considered to be at risk of exposure.<sup>1</sup></li> <li>• FeLV vaccination is highly recommended for all kittens.</li> <li>• Only cats testing negative for FeLV should be vaccinated; FeLV testing prior to vaccine administration is recommended.</li> <li>• Cats should be tested for FeLV infection before their initial vaccination and when there is a possibility that they have been exposed to FeLV since they were last vaccinated.</li> </ul>
<p>FIV Killed virus, adjuvanted Injectable</p>	<p>Three doses are required: the initial dose is administered as early as 8 weeks of age; 2 subsequent doses should be administered at an interval of 2 to 3 weeks.</p>	<p>Three doses are required: each dose is administered 2 to 3 weeks apart.</p>	<p>When indicated, a single dose is given 1 year following the last dose of the initial series, then annually in cats determined to have sustained risk of exposure.<sup>1</sup></p>	<p>Noncore</p> <ul style="list-style-type: none"> <li>• FIV vaccine should be restricted to cats at high risk of infection.<sup>1</sup></li> <li>• Vaccination induces production of antibodies indistinguishable from those developed in response to FIV infection and interferes with all antibody-based FIV diagnostic tests for at least a year following vaccination.</li> <li>• Cats with positive FIV antibody assay results may have antibodies as a result of vaccination, infection, or both.</li> <li>• Antibodies against FIV are passed from vaccinated queens to their kittens in colostrum. Colostrum-derived antibodies interfere with FIV diagnosis past the age of weaning in most kittens, but this interference appears to wane by 12 weeks of age.</li> <li>• Cats should test negative for antibodies against FIV immediately prior to vaccination.</li> <li>• Permanent identification of vaccinated cats (eg, microchip) will help clarify vaccination status but will not indicate that such cats are free of infection.</li> </ul>
<p>FIP (FCoV) MLV, nonadjuvanted IN</p>	<p>Administer a single dose at 16 weeks of age and a second dose 3 to 4 weeks later.</p>	<p>Administer 2 doses, 3 to 4 weeks apart.</p>	<p>Annual booster is recommended by the manufacturer</p>	<p>Not generally recommended</p> <ul style="list-style-type: none"> <li>• According to the limited studies available, only cats known to be negative for antibodies against FCoV at the time of vaccination are likely to develop some level of protection.</li> <li>• Vaccination of cats living within households in which FIP is known to exist or cats that are known to be positive for antibodies against FCoV is not recommended.</li> </ul>



Table 2—Summary of vaccination of cats in general practice (continued).

Vaccine	Primary series: kittens (≤ 16 weeks old)	Primary series: adolescent/adult (> 16 weeks old)	Booster	Comments
<b>C felis</b> Avirulent live organism, nonadjuvanted Injectable	Administer the initial dose as early as 9 weeks of age; a second dose is administered 3 to 4 weeks later.	Administer 2 doses, 3 to 4 weeks apart.	Annual booster is indicated for cats with sustained exposure risk.	Noncore <ul style="list-style-type: none"> <li>• Vaccination is generally reserved as part of a control regime for cats in multiple-cat environments in which infections associated with clinical disease have been confirmed.</li> <li>• Inadvertent conjunctival inoculation of vaccine has been reported to cause clinical signs of infection.</li> </ul>
<b>C felis</b> Killed organism, adjuvanted Injectable	Administer the initial dose as early as 9 weeks of age; a second dose is administered 3 to 4 weeks later.	Administer 2 doses, 3 to 4 weeks apart.	Annual booster is indicated for cats with sustained exposure risk.	Noncore <ul style="list-style-type: none"> <li>• Vaccination is generally reserved as part of a control regimen for cats in multiple-cat environments in which infections associated with clinical disease have been confirmed.</li> </ul>
<b>B bronchiseptica</b> Avirulent live organism, nonadjuvanted IN	Administer a single dose IN as early as 8 weeks of age.	Administer a single dose IN.	Annual booster is indicated for cats with sustained risk.	Noncore <ul style="list-style-type: none"> <li>• Vaccination may be considered in cases in which cats are likely to be at specific risk of infection.</li> </ul>
<b>Feline G lamblia</b> Killed organism, adjuvanted Injectable	Administer a single dose at 8 weeks of age; a second dose is administered 2 to 4 weeks later.	Administer 2 doses, 2 to 4 weeks apart.	Annual booster is recommended by the manufacturer	Not generally recommended <ul style="list-style-type: none"> <li>• There are insufficient studies available to support the role of G lamblia vaccination in preventing clinical disease in cats.</li> <li>• Whether the G lamblia vaccine is an effective therapeutic agent in naturally infected cats is currently not known.</li> </ul>

Core vaccines are recommended for all cats. Noncore vaccines should be administered to cats in specific risk categories. Not generally recommended vaccines are those that the Advisory Panel believes have little or no indication.

<sup>9</sup>Injectable adjuvanted vaccines have been associated with local inflammatory reactions at injection sites, with the degree of inflammation varying among products. The potential role of local inflammatory reactions in the genesis of vaccine-associated sarcomas remains controversial.

<sup>10</sup>Only available in combination with modified-live FHV-1 and FCV vaccines for IN administration. In unusual circumstances, if a cat is going to be placed in a known high-risk situation, an additional booster vaccination shortly before such risk is encountered may be considered.

<sup>11</sup>In the European Union, a combination modified-live FHV and killed (but nonadjuvanted) FCV vaccine has been approved for use in cats.

<sup>12</sup>All rabies virus vaccines must be administered in accordance with the specifications of the product label or package insert and with state or local regulations.

<sup>13</sup>Cats allowed outdoors, residing in open multiple-cat environments, living with FeLV-infected cats, and residing in households with cats of unknown FeLV-infection status or in which introduction of new cats is common. Booster inoculation is not generally recommended for cats housed strictly indoors.

<sup>14</sup>A recombinant FeLV vaccine available in Europe is designed to be administered by SC injection; this product differs from the licensed product in the United States.

<sup>15</sup>For example, outdoor cats that fight and cats that are not infected with FIV living with FIV-infected cats. For example, prior to confinement in multiple-cat environments such as rescue shelters, boarding facilities, or catteries in which bordetellosis has been confirmed.

## Appendix 2

### Injectable vaccination site recommendations

Vaccines designed to be given by injection should be administered by the SC route. Intramuscular administration does not mitigate the risk of vaccine-associated sarcoma formation and may delay detection, should a mass develop.

To facilitate management of vaccine-associated sarcomas, to avoid multiple injectable vaccinations at single sites (a putative risk factor for sarcoma formation<sup>10</sup>), and to aid in documenting vaccine placement, the following injection sites are recommended:

- Injectable vaccines containing antigens limited to FPV, FHV-1, and FCV (with or without Chlamydia felis) should be administered SC on the lateral side of the right forelimb below the elbow joint.
- Injectable vaccines containing Giardia lamblia antigens should be administered SC on the lateral side of the left forelimb below the elbow joint.
- Injectable vaccines containing rabies virus antigen (plus any other antigen) should be administered SC on the lateral side of the right hind limb below the stifle joint (vaccine-associated sarcomas arising in the proximal femoral area are difficult to completely excise; thus, placement of vaccines in this area is strongly discouraged).
- Injectable vaccines containing FeLV or FIV antigen (plus any other antigen except rabies) should be administered SC on the lateral side of the left hind limb below the stifle joint (vaccine-associated sarcomas arising in the proximal femoral area are difficult to completely excise; placement of vaccines in this area is strongly discouraged).
- Injection sites of other medications should be recorded.

### Monitoring of postvaccination masses

Encourage clients to monitor vaccination sites and to contact their veterinarian if a mass is detected. Biopsy the mass (incisional or wedge biopsy or multiple cores with a Tru-Cut-type device) if any of the following criteria are met (the 3-2-1 rule):

- the mass is present 3 months after vaccination.
- the mass is  $\geq 2$  cm in diameter
- the mass is increasing in size after 1 month.

## Appendix 3

### Vaccination documentation

Good documentation is required for health certificates and facilitates investigation of suspected adverse reactions or vaccine failure. If people other than the veterinarian writing the record administer vaccines (such as in some shelters), documentation is important in case training and compliance issues lead to vaccine failure. The cat's cage card or computer record may serve the purpose of a medical record in an animal shelter, depending on state and local regulations. Document the following clearly in the medical record:

- Proprietary name of product
- Manufacturer
- Serial/lot No. and expiration date
- Date administered
- Vaccine type
- Location on the cat's body
- Person administering the vaccination

## Appendix 4

### Vaccine handling and storage

- Lyophilized vaccine, once reconstituted, should be administered within 30 minutes. Reconstituted vaccine must never be frozen prior to administration nor stored for use at a later time.
- Heat, excessive cold, and exposure to light can render vaccines ineffective.
- Vaccines should arrive cold from the manufacturer and be refrigerated immediately.
- Vaccines should be stored in a middle compartment of the refrigerator. Avoid storing in the door and near the freezer compartment. Avoid the use of refrigerators with open freezer compartments.
- Excessive cold can alter the vaccine by uncoupling antigen-adjuvant complexes.
  - Uncoupled adjuvant may collect at the bottom of a multi-dose vial, causing pain and local injection reaction.
  - Uncoupling of the antigen-adjuvant complex may reduce the efficacy of the vaccine.
- Keep a thermometer in the refrigerator to ensure the temperature is between 2° to 7°C (35° to 45°F) at all times.
  - Make sure refrigerator doors close and latch securely.
  - Place a sign by the refrigerator plug stating, "Do not unplug."
  - In case of a power failure, keep refrigerator door closed and note temperature when power is restored.

## Appendix 5

### Vaccine preparation

- Always follow manufacturer's guidelines for preparing vaccines.
- Use appropriately sized syringes and needles to prepare and administer the vaccine.
- Use only 1 vaccine per single-use syringe and needle.
- Use only the diluent provided by the manufacturer.
- Completely dissolve reconstituted vaccines before drawing into syringe.
- Mix the vaccine with the diluent immediately prior to administration.
- Vaccines may be warmed to room temperature (approx 18 to 23.9°C [65° to 75°F]) before injection, but use is recommended within 30 minutes following reconstitution.
- If an injectable vaccine is spilled, clean vaccine off animals fur with alcohol swabs. Use standard 5% chlorine bleach diluted at 1:32 in water (or another disinfectant proven effective against FPV and FCV) for contaminated surfaces.



## Appendix 6

### Vaccine administration tips

- All vaccines should be administered by the route designated by the manufacturer. If a vaccine is accidentally given by an inappropriate route, the vaccine manufacturer should be contacted for specific recommendations.
- Modified-live respiratory virus vaccines intended for SC administration may cause serious URD if administered IN or if a cat makes oral contact with the vaccine.<sup>100</sup>
- Do not split vaccine doses (ie, 1 dose divided among several cats) unless such use is specifically permissible by the manufacturer.
- Cats can usually be vaccinated single-handedly by use of little or no restraint; at most, 1 other person may be needed to help hold and distract the cat.
- Administering a vaccine over a limb can often be done while someone calmly distracts the cat. If the cat is tense, place it on its side and lay the palm of the hand not administering the vaccine medial to the stifle or elbow joint. This painlessly prevents the cat from jerking the limb away.
- Minimizing the number of people handling the cat minimizes stressing the cat; even fearful cats can be vaccinated with minimal stress when handled gently in a calm and quiet environment.
- Unusual noises, smells, visual cues, and handling can be stressful to cats; a quiet environment with people talking in soft and calm voices decreases auditory stimuli.
- To decrease visual stimuli and prevent what an anxious cat may perceive as threatening, never approach from the front or make direct eye contact.
- Most cats can be safely handled when approached from behind. Using a towel as protection if necessary, gently move the cat's body toward you, with its hind quarters against the crook of the arm. Most cats respond favorably to slow and gentle massage around the chin and neck. For extremely anxious cats, restrict massage to the top of the head and neck.
- Some cats, especially young cats, can be distracted completely with treats while vaccines are administered. Ask the client to bring favorite treats and withhold food for 6 hours prior to the visit to increase appetite.
- When vaccines are administered, consider distracting the cat with toys. Ask the client to bring some of the pet's favorite toys, combs, or brushes to the hospital to help the cat feel more comfortable.
- Always reward good behavior with treats and praise immediately following vaccination. Never punish or heavily restrain a cat for negative behavior while calmly proceeding with your procedure.
- For IN administration of vaccines, it's best to approach from behind or attempt to distract an anxious cat. Administer the vaccine by gently tipping the muzzle upward and placing a drop in each nostril. Allow the cat's mouth to remain open so breathing is not impeded. If the cat is alarmed to see hands moving towards its face, gently cover the eyes with the same hand tipping the muzzle upward.
- The sound of the currently available transdermal administration device can alarm some cats. Speak calmly and consider distracting the cat with toys or treats to reduce anxiety related to the noise. Make clients aware of the pop sound prior to administration of the vaccine so they, too, don't startle and alarm the cat. Use of this administration system requires careful adherence to manufacturer instructions.
- More information on patient handling can be found in the Feline Behavior Guidelines from the AAFF.<sup>213</sup>