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Feline Leukemia Virus & Feline Immunodeficiency Virus in Shelter Cats

Association of Shelter Veterinarians (ASV) Shelter Guidelines Webinar Series
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Your Chat Moderator

Miranda Spindel, DVM, MS
Shelter Medicine Service
ASPCA
Your Presenter

Stephanie Janeczko, DVM, MS, DABVP, CAWA
Shelter Medicine Service
ASPCA
New York, NY

stephanie.janeczko@aspca.org
Let’s Talk FeLV and FIV!
FeLV & FIV - Transmission

• FeLV = “friendly,” spread in saliva through close physical contact
• Transmission from queens to kittens likely
• Age related resistance

• FIV = “unfriendly,” spread through bite wounds
• Sexual transmission, in utero or through nursing not common
• Generally low risk in households with stable social structures
FIV

- Acute infection = mild symptoms likely unnoticed
- Transient fever, lymphadenopathy, and leukopenia
- Within 2 weeks: high concentrations of virus detectable by culture, PCR

From AAFP Feline Retrovirus Management Guidelines (abridged)
FIV

• Clinical course depends on numerous factors:
  • Age and health at the time of infection
  • Dose and route of virus inoculation
  • Viral strain
  • Co-infections
  • Individual immunologic background.

From AAFP Feline Retrovirus Management Guidelines (abridged)
FeLV

- Acute infection = virus replicated in lymphoid tissues
- Fever, lethargy, diarrhea, lymphadenopathy, and leukopenia
- Within 1 week: viral genetic material detectable by PCR

From AAFP Feline Retrovirus Management Guidelines (abridged)
FeLV

- Infected cats may either:
  - Remain viremic and antigenemic – seropositive “progressive infection”
  - Revert to aviremic state – seronegative “regressive infection”

From AAFP Feline Retrovirus Management Guidelines (abridged)
FeLV

- Progressive infections:
- Viral replication → bone marrow → salivary glands
- Most cats are persistently antigenemic
- Often succumb to FeLV-associated diseases within a few years
FeLV

- Regressive infections:
- Limited virus replication – no bone marrow involvement
- Transient antigenemia
- Clinical relevance unclear, thought to be unlikely to develop or spread disease
Test results - reliability

• Two factors influence reliability:
  • How common the condition is
  • Test sensitivity and specificity
  • Identifying all infected animals
  • Identifying only infected animals

• FeLV & FIV screening tests:
  • Highly sensitive
  • Highly specific
  • Usually used in populations with low prevalence
FeLV and FIV Testing in an Animal Shelter
ASV Position Statement

The Association of Shelter Veterinarians (ASV), in keeping with the American Association of Feline Practitioners' (AAFP) feline retrovirus management guidelines¹, believes that the Feline Leukemia Virus (FeLV) and Feline Immunodeficiency Virus (FIV) status of every cat should be known. Understanding that the overall incidence in the cat population is low, and that shelters do not typically experience outbreaks of these diseases; ASV also believes that it should remain the decision of each individual shelter to determine if and when retroviral screening should occur for cats in their care. While testing before adoption is ideal and strongly encouraged, each shelter’s policies should be based on available resources, potential impact to population health, and program goals. Every shelter should inform adopters of the risk of these diseases including the recommendation that newly adopted cats be taken to their family veterinarian for initial screening, or retesting 60 days later if already screened at the shelter.

The AAFP feline retrovirus management guidelines¹ maintain that testing at shelter admission may be optional for singly-housed cats but is highly recommended for those in other housing designs. In situations where cats are housed in unfamiliar groups, treated for infectious diseases, and/or housed long term, shelters should strongly consider FeLV and FIV screening tests to be an essential component of the health care program.

¹American Association of Feline Practitioners’ Feline Retrovirus Management Guidelines
FIV testing

- FIV – chronic infections $\rightarrow$ low levels circulating antigen
- Screening testing = detection of p24 antibodies

Maternal antibodies
- 2d $\rightarrow$ 12+ wks

Vaccination
- 14d $\rightarrow$ 1+ yrs

Natural infection
- 2-4 wks $\rightarrow$ life

Presence of antibodies = FIV infection
FIV results - Interpretation

**Negative results:**
- Cat not infected with FIV
- Recent infection
- Late stage infection
- Inaccurate test result

**Positive results:**
- Cat infected with FIV
- Maternal antibodies*
- Vaccination
- Infected + vaccinated
- Inaccurate test result

Negative results are highly reliable, but positive results should be questioned – especially in asymptomatic low risk cats.
FeLV Testing

• Genetic material gets integrated with cat’s DNA, copied when cells reproduce
• Virus produces several proteins – p27 found in high levels in plasma and used for testing
• Screening tests detect p27 antigen in the blood
• Gives no indication of bone marrow infection
• Progressive vs. regressive infections
FeLV results - Interpretation

Negative results:
- Cat not infected with FeLV
- Recent infection
- Focal infection
- Inaccurate test result

Positive results:
- Cat infected with FeLV (progressive or regressive)
- Very recent vaccination
- Inaccurate test result

Negative results are highly reliable, but positive results should be questioned – especially in asymptomatic low risk cats.
Reliance on a single test result

• No test is perfect
• Ideally all results should be confirmed
• Negatives – repeat test in 60 days
• Positives – additional testing, now or later

• In reality, not always possible
Discordant results - FeLV

• What to do:
  • Assume infected and treat accordingly as source of infection
  • Repeat testing in 60 days, then yearly until results agree
  • Persistently discordant results do occur

• Options will depend on mission, resources, etc
FeLV/FIV Management

- General recommendations:
  - Keep indoors
  - Reduce stress
  - Appropriate diet, husbandry
  - Spay/neuter
  - Parasite prevention/control
  - Avoid certain drugs
  - Regular veterinary exams q6 months
  - Early detection, common problems
  - Bloodwork, urinalysis, fecal exams
Prevention and control

• Not a concern for outbreaks in the shelter

• Direct contact still a concern $\rightarrow$ efficiently transmitted via contaminated body fluids
  • Direct contact
  • Inappropriate clinical practices – sharing sx packs, needles, ET tubes, etc
Prevention and Control

• Housing:
  • Testing optional for individually housed cats, but required prior to introduction to others (e.g. colonies, surrogate queens, etc)
  • Do not house in isolation areas due to immunosuppression

• Cleaning & disinfection:
  • Inactivated within hours on dry surface, can persist in dried organic matter > 1 week
  • Readily inactivated by detergents and common disinfectants.
FeLV Vaccination

• Several products available

• Non-core, for cats at risk of exposure
• Use in shelters? Group housing arrangements
• Current recommendation for all kittens

• Protection is not absolute, not a substitute for limiting contact with infected cats

• Test before vaccination – not helpful if infected

• Does not impact test results
FIV Vaccination

• Limited availability for use in high risk cats
• Does not provide complete protection
• Always test first – no benefit to vaccinating an infected cat
• Hinders ability to test in future
• Try to identify as vaccinated – e.g. link to microchip
FIV

FIV Diagnostic Algorithm—Kittens (<6 months of age)

1. **History/Physical Exam**
   - SNAP® Combo Test
     - FIV Antibody-Positive
       - May be due to maternal antibodies if history is unknown
       - Start management program immediately
       - Retest at 60-day intervals
     - FIV Antibody-Negative
       - Consider free of infection and begin wellness program immediately
   
   - SNAP® Combo Test
     - FIV Antibody-Positive
       - Maternal antibodies may take up to six months of age to clear; continue testing in 60-day intervals
     - After kitten reaches six months of age...
     - FIV Antibody-Negative
       - Consider free of infection and begin wellness program

2. **Adult Cats (>6 months of age)**

   - **History/Physical Exam**
     - SNAP® Combo Test
       - FIV Antibody-Positive
         - All positive results should be confirmed
         - Cats vaccinated with a whole-virus vaccine will test antibody-positive
         - Start wellness program immediately
       - FIV Antibody-Negative
         - Consider free of infection and begin wellness program

   - **Western Blot Test**
     - FIV Western Blot-Positive
       - Consider FIV-infected and continue appropriate management program and/or treatments (see management plan)
     - FIV Western Blot-Negative
       - Disagreement results—further testing may be in early stage or initial EU/SA results may be incorrect
       - Retest in 60 days using both SNAP® and Western blot

3. **Important note about FIV vaccines:**
   - Cats vaccinated with whole-virus FIV vaccines will test positive on all currently licensed FIV antibody diagnostics, including SNAP® FIV/FelV Combo, PatChek® FIV Ab and Western blot. Therefore, if choosing to vaccinate, test immediately prior to administration.

FeLV diagnostic algorithm

All Cats

1. History/Physical Exam

2. SNAP® Combo Test

   - FeLV Antigen-Positive
     - All positive results should be confirmed, start wellness program immediately, retest immediately with IFA

   - FeLV Antigen-Negative
     - Consider free of infection and begin a wellness program

3. FeLV IFA Test

   - FeLV IFA-Positive
     - Consider FeLV-infected and start appropriate management program and/or treatments (see management plan)

   - FeLV IFA-Negative
     - Discrepant results—test infection may be in early stage or initial ELISA results may be incorrect. Repeat in 28 days using both SNAP® and IFA

4. SNAP® Combo Test and IFA Test

   - SNAP® Positive, IFA Positive
     - Consider FeLV-infected and start appropriate management program and/or treatments (see management plan)

   - SNAP® Positive, IFA Negative
     - Discrepant results. Repeat both the SNAP and IFA at six-month intervals. The health of these cats should be monitored and managed with the same care as if they were FeLV-infected.

   - SNAP® Negative, IFA Positive
     - One of the results is incorrect. Repeat both tests

   - SNAP® Negative, IFA Negative
     - Consider free of infection and continue wellness program

Important note about FeLV vaccines:
Cats vaccinated for FeLV will NOT cause currently available antigen diagnostics to be positive. However, if choosing to vaccinate, test immediately prior to administration.