

Feline Infectious Peritonitis – Is it Finally a Treatable Disease?

Susan Little, DVM, DABVP (Feline)
Bytown Cat Hospital, Ottawa, ON, Canada
catvet@vin.com
@catvetsusan

Feline Coronavirus

- **Feline infectious peritonitis (FIP)** is caused by a form of feline coronavirus that infects the enterocytes of the small intestine (feline enteric coronavirus, FECV).
- This virus stores its genetic material in RNA (rather than DNA) and it has a relatively large genome (the complete set of genetic material present in an organism).
- When the virus makes copies of its genome during production of new virus particles, it can make errors that can become mutations.
- Some mutations allow the virus to replicate in **monocytes/macrophages** instead of enterocytes. This allows the virus to access almost any body organ and cause disease, and it is now called feline infectious peritonitis virus (FIPV).

Biotypes and Transmission

- **FECV** is highly contagious but low in pathogenicity, mostly remaining localized in the small intestine. FECV is shed in feces and transmitted via the fecal-oral route.
- **FIPV** is rarely contagious (it is rarely shed in feces, making cat-to-cat transmission rare) but it is highly pathogenic.

Virulence Factors

- **Virus factors** (mutation rate, exposure dose).
- **Host factors** (immune response, genetics, breed susceptibility).
- **Environmental factors** (stress, crowding, poor sanitation).
- A cat's **cell-mediated immune response** determines the disease outcome:
 - Healthy cats mount a **good cell-mediated immune response**, avoiding illness.
 - Partial immune responses lead to **non-effusive (dry) FIP**.
 - Ineffective responses result in **effusive (wet) FIP**, characterized by severe inflammation.

Clinical Forms of FIP

- **Effusive (wet) form:**
 - Characterized by **vasculitis**, leading to exudation of fluid into body cavities.
 - Rapid progression, often fatal if untreated.
- **Non-effusive (dry) form:**
 - Marked by **pyogranulomas**, causing organ dysfunction.
 - Slower progression, making diagnosis more challenging.

Clinical Signs

FIP initially presents with **non-specific symptoms** such as:

- Lethargy, appetite loss, weight loss, slow growth, intermittent fever. Depending on the disease form, additional signs can include:

- **Effusive FIP:** Dyspnea (pleural effusion), abdominal swelling (ascites), pericardial effusion.
- **Non-effusive FIP:** Organ-specific symptoms such as **ocular disease** (uveitis, hyphema) and **neurological signs** (seizures, ataxia, vestibular dysfunction).

Diagnosis Challenges

- Diagnosis is particularly difficult in **non-effusive FIP**, requiring a combination of:
 - Signalment and clinical history.
 - Routine lab tests, imaging, biopsies.
 - **Immunohistochemistry** and **molecular tests** for confirmation.

Treatment with Antiviral Drugs

- New **antiviral therapies** for FIP have been available in some countries since 2021, showing **high success rates**: remdesivir (IV, PO, SC), GS-441524 (the active form of remdesivir; IV, PO), molnupiravir (PO), and others.
- Multiple studies suggest **GS-441524** is the most effective and well-researched drug.
 - Treatment duration has traditionally been **12 weeks**, but a **2024 study found 6 weeks to be equally effective** in cats without ocular or neurologic signs (1).
- Note that injectable remdesivir has a very low pH and injection site pain, inflammation, and necrosis have been anecdotally reported.

Currently recommended dosages of GS-441524

Presentation	Oral dosage
Effusion, no neurologic or ocular signs	<ul style="list-style-type: none"> • 6.0–7.5 mg/kg, every 12 hours, for 84 days OR • 7.5 mg/kg, every 12 hours, for 42 days
No effusion, no neurologic or ocular signs	
Ocular signs +/- effusion	7.5–10.0 mg/kg, every 12 hours, for 84 days
Neurologic signs +/- effusion	10 mg/kg, every 12 hours, for 84 days

Prognosis and Considerations

- About **85% of cats** treated with GS-441524 recover fully.
- **Early clinical improvements** (within one week) are linked to better outcomes.
- **Relapses are uncommon**, but treatment failure can occur in severely affected cats.
- **Remdesivir** may be used in cases where GS-441524 is unavailable, when cats have severe **neurologic signs**, or when cats cannot tolerate oral medication.

(1) Zuzzi-Krebitz AM, et al. Short Treatment of 42 Days with Oral GS-441524 Results in Equal Efficacy as the Recommended 84-Day Treatment in Cats Suffering from Feline Infectious Peritonitis

with Effusion-A Prospective Randomized Controlled Study. *Viruses*. 2024;16(7):1144. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11281457/>