

The Story of Luna: A New Kitten, Fatal Disease Diagnosis, and a Miracle Cure

After careful research and education to learn about Savannah cats, and ultimately selecting a reputable breeder, Luna joined our family in March of 2017.

Luna was spunky, alert, playful, and in seemingly good health when I picked her up in Boston from her breeder. Luna's an exceedingly friendly, funny, quirky, overly loving cat who's loaded with personality. She exceeded all the expectations of what we thought a Savannah kitten would be. She quickly melded into our home and our hearts as our first pet.

Luna was due for her second feline distemper combination vaccine and a vet follow-up examination soon after her arrival. On April



13, 2017, she received that vaccine, which is routine protocol for healthy kittens. After receiving the vaccine, Luna immediately refused to eat, slept continuously, and felt very hot to the touch. My husband and I already thought she looked a little distended around her abdominal midline. I made mention of this to her vet during this visit, but was reassured it was just a "normal kitten belly". The only abnormality noted during her exam was a grade III heart murmur. Luna was deemed otherwise healthy with a plan to reassess the heart murmur in a few months and consider a referral to a veterinary cardiologist if it didn't resolve.



Luna's FIP Diagnosis: The Right Place at the Right Time

The abdominal distention was worsening as the days went on, so on April 21st, we took Luna to the veterinary emergency hospital. I'd already researched the causes of abdominal distention in kittens and read about Feline Infectious Peritonitis (FIP). FIP was in the back of my mind; however, it's not common. I thought at the worst; it'd be a parasite.

The vet aspirated some fluid from her abdomen during the exam and brought it to the exam room in a specimen tube. She was sure, given the assessment of the fluid, lack of appetite, lethargy, and fever of 105 degrees, Luna had the effusive (wet) form of FIP, which leads to fluid accumulation in the abdomen and chest. She told us the grim prognosis, and that she had a few days, to maybe two weeks at best to live. She suggested we come back in a few days for a consult with an internist to discuss any life-prolonging options and a second opinion; or euthanize if her condition deteriorated over the weekend.

On April 24th, we saw the specialist for the second opinion. Luna had an echocardiogram, x-rays, ultrasound, and more blood tests, which served to confirm the diagnosis of FIP. This time was a long, grueling three days. We came to terms with the reality of losing our new baby while scrambling and researching to see what we could do to save her. FIP is 100% fatal, with no treatment or cure. How could this be happening? We'd waited so long to get her (even having a bad prior experience with another breeder three months earlier that turned out to be a scam). There had to be a way to save her and I was going to find it.

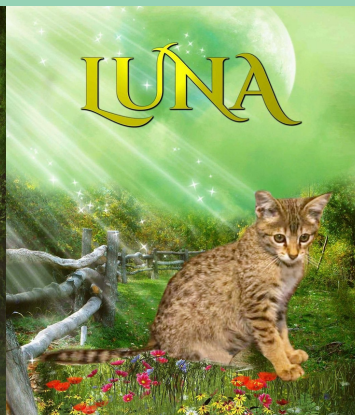
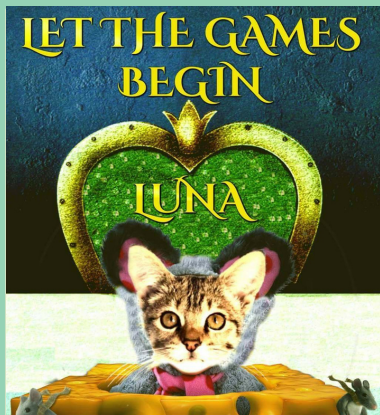
As a nurse at a large teaching hospital, I'm familiar with clinical trials and research. I thought to myself, "surely there's something out there in the works for FIP." So, I called and emailed every major veterinary college in the country during that long, grueling weekend waiting to see the specialist.

To my surprise on April 23rd, I received a call back from a veterinary technician, Michael, at UCD. He is the assistant to Dr. Niels Pedersen (professor and researcher, who's worked on a cure for FIP since the 1960s), with news

of a new drug trial pending institutional approval. We discussed the details of Luna's diagnosis and testing, and I was instructed to email her records and results ASAP. I received another call on the 24th (the same day Luna saw the specialist) to further discuss the trial and possibility of flying with Luna to Sacramento--IF they could get the approval pushed through.

If we made it, Luna would be the first privately owned, naturally acquired FIP-infected cat to start this new drug trial. To make this even more surprising, she was at the perfect age to respond to the drug, an antiviral RNA inhibitor. Luna would go to their clinic for 5-10 days of drug trial and monitoring. Time was limited, as she was deteriorating fast and with a fever of 105 degrees. Dr. Pedersen told us to get there as soon as we could.

We made it Sacramento on April 28th, seven days after her diagnosis. Dr. Niels Pedersen explained the protocol in detail, complete with diagrams of how the drug works to stop viral replication. We then went to the room where Luna would stay for the next 5-10 days, and that's when she received her first injection and thorough examination.



The Anti-Viral Trial Drug Known as EVO984/GS-441524 Went to Work Immediately

Luna responded extremely fast to the drug called "EVO984/GS-441524," even seeing improvement in her fever and behavior, after only one injection. Luna responded so well; we were able to come home on day six. She would receive another 11 plus weeks of daily injections to complete her treatment regimen. It was like bringing home a healthy, new kitten; a kitten free from fever, malaise, and abdominal distention.

I continued to administer the antiviral injections daily at home for a total of 12 weeks. Dr. Pedersen guided us the entire time as to when to have blood work repeated by our local vet. Dr. Pedersen reviewed the results, along with periodic weight checks, so her dosage could be adjusted accordingly. As a side note, this is the second drug trial since 2016 conducted by UCD for FIP. The first drug, GC376, was able to put five out of 20 FIP cats into successful remission, who, to date, haven't relapsed. Luna's drug, EVO984/GS-441524, has been even more successful, with approximately

A Happy Ending for Luna and a Hopeful Future for Cats Diagnosed With FIP

26 cats achieving full remission, which is now known to be a cure.

Luna's last injection of EVO984/GS-441524 was on July 23rd, 2017. She's thriving, shows no signs of disease, and her lab work remains perfect today. She loves to go camping and on backpacking adventures--she's hiked up to 13 miles with us, either walking on her harness or riding on our backpack. It's not every day you see a cat on a leash or at a campsite!

Luna's been FIP-free for over three years. She's living a normal, healthy life and is enjoying her three buddies, Savannah cats, Titan, Calypso, and Phoebe, whom we added in October 2017 and November 2018.

Steve Dale, animal behaviorist of Steve Dale's Pet World, interviewed me about Luna's drug trial. You can listen to the [radio interview](#) (Flash Player required) journey, as well as any current information on the drug trials at U.C. Davis on their website.



Graphics by:
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To learn about the most recent developments and treatment of FIP, continue to the page 24. Please consider donating to the continued drug trial research efforts at UC Davis:



To learn more about Luna and Feline Infectious Peritonitis, check out her stories and [FIP-related updates and articles](#).

2020 – GS-441524 SPRING UPDATE

Niels C. Pedersen, DVM, PhD
School of Veterinary Medicine, UC Davis
(used with permission)



DEAR VETERINARIANS, CAT OWNERS AND PUBLIC:

I am being increasingly questioned about the relationship of GS-441524 and a very promising treatment for Covid-19, Remdesivir. GS-441524 is the biologically active component of Remdesivir and has been widely used around the world to safely and effectively cure cats of feline infectious peritonitis (FIP) for over 18 months. FIP is a common and highly fatal coronavirus disease of cats. GS-441524 and Remdesivir are almost identical drugs. Remdesivir is the form of GS-441524 that Gilead Sciences has chosen to use in humans for COVID-19 and is now in clinical trials in China, USA, and

several other countries. Remdesivir is what is known as a prodrug. A prodrug is altered by infected cells to yield the active ingredient, which in this case is basically GS-441524 with the addition of one phosphate group (i.e., GS-5734). Gilead scientists slightly altered GS-5734 to protect the added phosphate group and allow absorption into cells. This form of GS-441524 is what is known as Remdesivir. Once in the cells, cellular enzymes remove the protection to yield GS-5734. GS-5734 is further activated by the addition of two more phosphates in the cells to the triphosphate form of GS-441524.

This is the molecule that inhibits the production of viral RNA. We chose to use GS-441524 for treatment of the coronavirus disease FIP because it had identical antiviral properties to Remdesivir and at the time was not under consideration by Gilead Sciences for use in humans. GS-441524 is also much cheaper to make than Remdesivir. Therefore, there was no apparent conflict with using one form for cats and another form for humans. However, Gilead came to believe that our cat research would interfere with their ability to get Remdesivir approved for humans and refused to grant animal rights for GS-441524. This refusal, coupled with the desperate need around the world for the treatment of FIP, led to a Chinese black market for GS-441524. FIP is also a significant problem in pet cats in China, and Chinese cat owners were even more desperate for a treatment for FIP than owners in other countries. The first papers describing GS-441524 treatment of cats with FIP were published in 2018 and 2019 and thousands of cats have been treated since then. In spite of this experience, the medical profession, including researchers, have been seemingly unaware of the use of GS-441524 for a coronavirus disease of cats and its relationship to Remdesivir. Veterinarians also have considerable experience with coronaviruses, coronavirus diseases, and coronavirus vaccines for swine, calves and poultry that has gone unappreciated. Pet ferrets also suffer a severe FIP-like disease caused by their own species of coronavirus. What will happen to supplies of GS-441524 for cats if Remdesivir is proven to be safe and effective as a treatment for Covid-19? GS-441524 is the first critical step in the production of Remdesivir and it is logical to assume that there will be a competition between cats and humans for it. On a positive note, worldwide approval for Remdesivir may also help change minds against granting animal rights for GS-441524. If approved for human use, Remdesivir, if not GS-441524, would become “legally” available through veterinarians. However, the safety and efficacy of Remdesivir for FIP has not been established.