

## Question

A cat owner says that she is concerned about potential transmission of cat scratch disease to her roommate. Which of the following would be the most effective way to reduce the likelihood of disease transmission?

- Monitor the cat closely for signs of illness and seek immediate veterinary care
- Recommend cleaning the litter box daily
- Use effective flea control medications
- Use effective tick preventive medications

**Explanation** - Cat scratch disease, caused by **Bartonella henselae**, results in fever and lymphadenopathy, particularly in immunocompromised people. Cats typically do not display any clinical signs of disease, so monitoring the cat would not be helpful. Fleas are implicated in disease transmission with the bacteria seen in flea feces. It is thought that typically, cats with infected flea feces on their claws scratch and inoculate the bacteria into people. Cats can also be bacteremic and have bacteria present in their saliva.

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## Question

Your client is pregnant and is worried about acquiring toxoplasmosis from her cat. What do you advise?

- Submit toxoplasmosis titers from the cat. A IgG titer of 1:64 or greater suggests recent or active infection that could pose a danger.
- Toxoplasmosis titer should be performed on the owner by a human physician. A positive titer indicates antibodies to the organism that will prevent infection in the first trimester. A negative titer indicates she should remove her cats from her environment.
- Submit toxoplasmosis titers from the cat. A positive cat infected with toxoplasmosis can shed multiple times in its lifetime and pose a zoonotic risk.
- Empty the litter box daily as a simple precaution to prevent infection as it takes 1-3 days for passed oocysts in the stool to sporulate into an infective form

**Explanation** - Toxoplasmosis gondii is a protozoal organism. The cat is the definitive host; the entire life cycle of the organism can be completed within this host. Most cats become infected when they **consume an exposed rodent** with bradyzoites encysted in their tissues. **Only recently infected cats generally shed oocysts in their stool, and cats typically only shed these oocysts for 1-2 weeks. Most cats will only have one shedding episode in their lifetime and most cats will test seropositive for toxoplasmosis.**

A **IgM (not IgG) titer of 1:64 or greater suggests recent or active infection** and that cat is at risk of shedding oocysts in their stools. Oocysts are not infective until they sporulate. This process takes > 24 hours, so emptying the litter box daily is advised, preferably by someone who is not pregnant.

If an owner has owned cats for a long while, it is possible that they may have previously been exposed and therefore have mounted an immune response to the organism. If so, it may be

advisable to test for Toxoplasma antibody titers in the owner. A sufficient antibody titer will mean the client is protected from infection during the first trimester.

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### Question

A pregnant woman brings her cat to you to perform Toxoplasma gondii titers on it. The cat has no clinical signs. What would be appropriate to tell the woman?

- A single serum titer should be able to determine if the cat is likely shedding oocysts presently.
- Cats seropositive for Toxoplasma gondii shed oocysts most of the time, so the woman should separate herself from the cat and its feces.
- Toxoplasma oocysts take about 5 days to sporulate and become infective, so as long as the woman has the cat's litterbox cleaned before 5 days have passed, she should not have to worry about being infected.
- A large percentage of cats are seropositive for Toxoplasma gondii, but are not necessarily shedding oocysts.

**Explanation** - The correct answer is a large percentage of cats are seropositive for Toxoplasma gondii but are not necessarily shedding oocysts. Infected cats will usually only shed oocysts for 1-2 weeks when they are initially infected. They usually don't shed again unless they become severely immune-compromised. **Paired serum titers** should be taken **1-2 weeks apart** in order to determine the stage of infection. A rise in the consecutive titers would mean the cat was recently infected. Titers that aren't significantly different can be interpreted as the cat having an old infection and is less likely to be actively shedding oocysts. Infectivity of the oocysts occurs with sporulation, which occurs within 1-5 days after shedding. Daily cleaning of the litterbox by non-pregnant woman will help to reduce the likelihood of infection.

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### Question

Why is toxoplasmosis a public health concern?

- Infants may be infected in utero and later show chorioretinitis along with mental retardation
- Results in severe cutaneous lesions
- Results in death of pregnant women
- Toxoplasmosis is not of public concern
- Results in mild, flu-like illness

**Explanation** - The correct answer is **infants may be infected in utero and later show chorioretinitis along with mental retardation**. Flu-like symptoms can occur and lymphadenopathy may persist for months, but this is minor in comparison to the effects on in utero infants. Pregnant women usually do not show any signs of infection. There are no cutaneous lesions in humans associated with Toxoplasma gondii infection. Interestingly, greater than 95% of AIDS patients suffering from toxoplasmosis are a result of cyst reactivation in the brain and not

due to a recent infection. Their main signs are encephalitis, chorioretinitis, and sometimes pneumonia. To prevent exposure to pregnant women, recommend that they do not change their cat's litter box (avoid feces).

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### Question

Gracie, a 1-year old female barn cat who recently became an indoor pet, presents for her pre-spay and vaccination visit. Gracie appears clinically healthy on examination, other than a few fleas found in her haircoat and moderate gingivitis. The elderly owner states that he recently became ill after she had scratched him. He developed a fever, headache, malaise, and lymphadenopathy near the scratch site. His doctor told him he should not have Gracie as a pet, but he does not want to give her up. Which of the following treatments should Gracie receive?

- Euthanasia
- Milbemycin and ectoparasite treatment
- Doxycycline and ectoparasite treatment
- L-Lysine and ectoparasite treatment
- Ectoparasite treatment only

**Explanation** - The symptoms the owner reports after receiving a cat scratch (or bite) are most likely caused by Bartonellosis. Feline Bartonella is most often caused by *Bartonella henselae*, a gram negative bacterium that infects the erythrocytes of cats and is transmitted by the flea. If the cat gets flea dirt (digested blood) in their claws from scratching themselves and then scratches a human, the disease can be transmitted.

Most often the infection is self-limiting; however, in immunocompromised humans, the disease can be much more serious and even life-threatening. Despite treatment with doxycycline or erythromycin (the two most efficacious drugs for treatment of cats), most cats will continue to be a carrier of the disease, thus still putting the immunocompromised owner at risk. The cat in question should be started on **doxycycline and treated for ectoparasites** because the owner recently contracted the disease, and the cat may be actively bacteremic; subclinical cats are typically not treated.

Gingivitis could be a clinical manifestation of this disease, but could also be commonly caused by calicivirus. The cat should only be kept indoors to help prevent further ectoparasite infestation and be treated monthly with a preventative for ectoparasites. If fleas were treated and prevented diligently, the risk of transmission to the owner again is very low. However, it is important the owner realize the risk and consider his own medical doctor's advice.

Declawing this cat could be considered to further lower the risk, or at least keeping the nails trimmed short is recommended as an additional precaution. There are 5 tests available to detect this bacterium: ELISA, IFA, PCR, Culture, and Western Blot.

Milbemycin oxime (Interceptor) is a treatment and prevention against hookworm, roundworm, and whipworm infection. It is also prevention for heartworm disease. It is not used to treat or prevent fleas or ticks.

Because the seroprevalence in the cat population can be as high as 30% for *Bartonella* and transmission of it can typically be prevented, euthanasia is not recommended, especially in

asymptomatic cats. L-lysine is used as an anti-viral to prevent herpes outbreaks, especially in cats with recurrent ocular/respiratory disease although recent reports call its efficacy into question.

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### Question

A woman presents a middle-aged male intact domestic short hair to your clinic. She found him as a stray where she lives out in the country. She noticed he was lethargic and hanging around her yard, so she was feeding him in order to capture him and bring him to the vet. She states there are many stray cats and prairie dogs around her property. On physical exam, the cat is lethargic, has a temperature of 104.9F, severe **mandibular lymphadenopathy** with a draining tract under the chin, and is covered in **fleas**. His breathing is tachypneic. What do you do first?

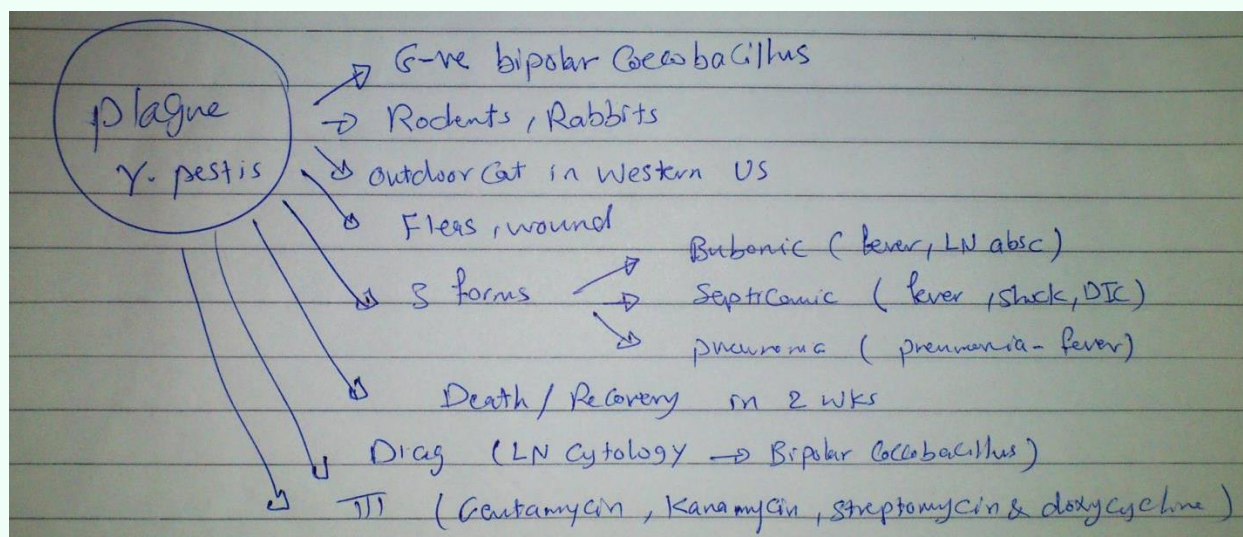
- Clean the abscess and send the cat home on a 3-week course of Doxycycline tablets followed with 6 cc of water
- Wear protection and quarantine the animal, then call the state veterinarian
- Euthanize the cat immediately
- Gram stain cytology of the draining tract lesion
- Run a CBC/Chemistry/Urinalysis, flush the abscess with dilute chlorhexidine solution, and start broad spectrum antibiotics

**Explanation** - This animal is exhibiting signs of **plague** caused by the **Gram-negative rod-shaped** bacteria **Yersinia pestis**. Plague is usually transmitted by the bites of infected fleas. Carnivores can also contract plague when they eat an infected rodent. Clinical symptoms can occur in 1-2 days in cats, but in humans, the incubation period can be up to 8 days.

A tentative diagnosis can be made with a **Gram's stain cytology of infected material**, such as the draining lesion of this cat. Yersinia pestis is a gram negative bacterium and has a bipolar safety-pin appearance. Definitive diagnosis is based on culture. However, before collecting any samples, the state vet or CDC should be contacted. The samples have to be collected and submitted under strict guidelines to prevent the spread of disease.

Plague is highly zoonotic and **bubonic, septicemic, pneumonic**, and **meningeal** forms can occur. Early treatment is critical for survival. Antibiotic treatment early in the course of disease can greatly improve prognosis. Any persons exposed at all to this cat should seek treatment, including hospital staff, the owner, her family, etc.

Because of the cat's clinical status, the most likely thing that will occur is euthanasia, but the state veterinarian will give instructions on how best to handle this animal.



### Question

Sydney is a 1.5-year old male neutered DSH, previously feral but now an indoor only cat. He has a history of controlled diabetes mellitus and recent bloodwork was within normal limits aside from elevated blood glucose of 200 mg/dl.

He presents to you today for difficulty breathing and x-rays showed **pleural fluid**. You remove 250mL of serosanguinous fluid and you are concerned about the possibility of feline infectious peritonitis (FIP); which of the following tests would be most helpful in ruling out FIP (which has the highest negative predictive value)?

- Rivalta's test
- RT-PCR for coronaviral RNA in serum
- Coronavirus antibody detection in effusion fluid
- Immunofluorescence staining for coronavirus in macrophages in effusion fluid

**Explanation** - Of the tests listed, Rivalta's test has the highest negative predictive value in the diagnosis of FIP. This means that a negative test is likely associated with the cat **truly not having the disease**. In two separate studies, Rivalta's test has been shown to have a negative predictive

value (NPV) greater than 90%. False positives are more commonly seen in older cats and cats with lymphoma or bacterial infections but negative results are relatively convincing compared to most other diagnostic tests for this disease.

Rivalta's test involves filling a reagent tube with distilled water and 1 drop of acetic acid (98%). On the surface of this solution, 1 drop of the effusion fluid is added and if the drop disappears and the solution remains clear, the Rivalta's test is negative. If the drop retains its shape, stays attached to the surface, or slowly floats down to the bottom of the tube as a drop, Rivalta's test is defined as positive.

The other tests listed tend to have high PPVs and are more specific but have more false negatives and are not as good for ruling out the disease.

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### Question

Julio is a 1.5-year old male neutered domestic short hair previously feral but now an indoor only cat. He presents to you today for difficulty breathing and x-rays showed pleural fluid. You remove 200mL of serosanguinous fluid and you are concerned about the possibility of feline infectious peritonitis (FIP). Which of the following tests would be most convincing in confirming a diagnosis of FIP (which has the highest positive predictive value)?

- Rivalta's test
- Immunofluorescence staining for coronavirus in macrophages in effusion fluid
- Presence of immune-complexes in serum measured by ELISA
- Presence of anti-coronavirus antibodies in serum

**Explanation** - Of the tests listed, immunofluorescence staining for coronavirus in macrophages in effusion fluid has the highest positive predictive value for confirming FIP (reportedly as high as 100%). The NPV of this test is relatively low (57%) so a negative test doesn't rule out FIP.

Rivalta's test has a low PPV (58-86% depending on the population tested) and a high NPV (93-97%).

**So To R/O the disease, Rivalta's test. To confirm the disease, Immunofluorescence staining.**

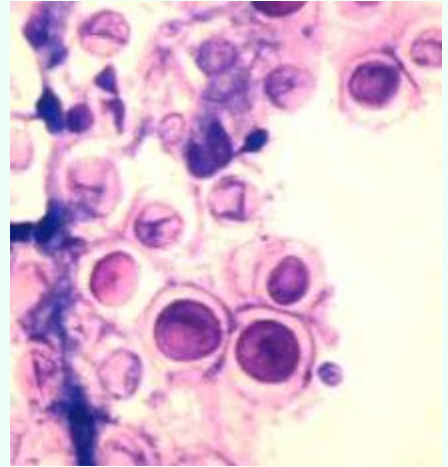
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### Question

In a cat with CNS signs (ataxia, cranial nerve deficits), which is not a convincing indicator that Cryptococcus is the cause of its signs?

- Demonstration of numerous small yeasts with large capsules in a CSF tap
- A latex agglutination titer of 1:100 on CSF
- A latex agglutination titer of 1:10,000 on serum
- A mixed pleocytosis and elevated protein on CSF analysis with no bacteria

**Explanation** - The correct answer is a mixed pleocytosis and elevated protein on CSF analysis with no bacteria. Demonstration of the organism, visible as small yeasts surrounded by a large capsule is occasionally seen with *Cryptococcus*. **Serology is also very useful for diagnosis.** The latex agglutination test against the cryptococcal antigen is very sensitive and specific and can be used to document disease or monitor therapy. It can be run on serum, CSF, or urine. A mixed pleocytosis is common in many conditions causing CNS signs and is not specific for any of them.

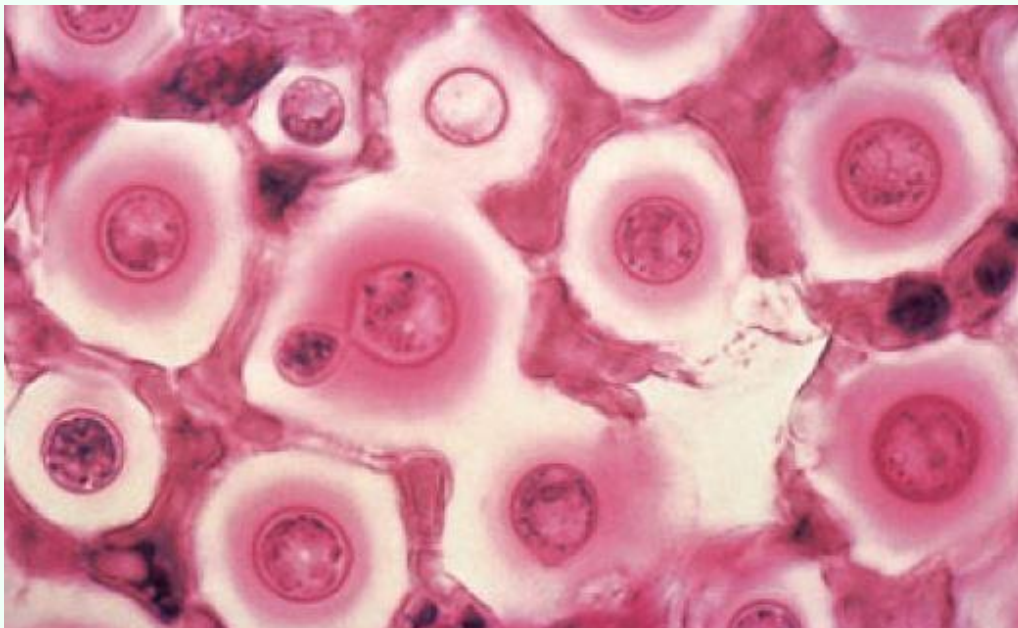


Cryptococcosis is the most frequent mycotic infection in cats. Many systems can be infected including the respiratory tract, the skin, the nervous system, and the eyes. Infections of the upper respiratory tract are most frequent, followed by cutaneous infection. *Cryptococcus neoformans* has a clear capsule of variable thickness; it is sometimes possible to find poorly encapsulated forms. A diagnosis can be confirmed by cytology, culture, or serologic testing. This infection can also be encountered to a lesser extent in other species including people.

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### Question

An owner brings in her 4-year old domestic short hair cat for decreased appetite and sneezing. She has very limited funds for diagnostics, but approves a fine needle aspirate of the swelling you noticed over the bridge of the nose. You perform the aspirate and look at the slide under the microscope (see image). What medication should you prescribe for this cat?



- Chlorambucil
- Clindamycin
- Fluconazole
- Fenbendazole

**Explanation** - The cytology from the fine needle aspirate shows cryptococcus. Cryptococcus is an encapsulated fungus and is treated with anti-fungal medications such as fluconazole or itraconazole.

Clindamycin is used to treat toxoplasma. Fenbendazole is used to treat intestinal parasites such as hookworms, roundworms, and Giardia. Chlorambucil is a chemotherapeutic agent often used in treating lymphoma.

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### Question

A 3-year old indoor/outdoor domestic short hair cat presents with a history of lethargy and decreased appetite. T= 103.1, P= 200 bpm, R= 36. On exam you note a swelling over the bridge of the nose and on fundic exam see some dark circular lesions in the retinas. The disease you suspect in this cat may have been transmitted by which of the following?



- Scratch from another cat
- Inhalation of spores from pigeon droppings
- Ingestion of oocysts from raw meat
- Puncture wound from contaminated soil

**Explanation** - Cryptococcus is a genus of encapsulated yeast that is often associated with or found in **pigeon droppings and eucalyptus trees**. The spores are most often inhaled from the environment where these are present. Cats with cryptococcus will often develop a swelling over the bridge of the nose and lesions in the retinas.

Sporothrix is a fungus found in the soil ("rose grower's disease") and is introduced into the body via a puncture from a thorn or through an open wound or cut when exposed to contaminated soil.

Toxoplasmosis may be transmitted through ingestion of raw meat.



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## Question

A 3-year old male DSH cat presents to your clinic for dyspnea. On physical exam the cat is febrile. You identify pleural effusion and obtain a sample. The fluid has a protein of 9 g/dL and is thick. The cellularity is low and the predominant cell type is neutrophils. What is your primary differential?

- Feline infectious peritonitis
- Lymphoma
- Feline leukemia virus
- Thymoma
- Feline immunodeficiency virus

**Explanation** - The correct answer is FIP. With FIP, the classical lesion is **pyogranulomatous vasculitis due to antigen-antibody complexes depositing in the venular endothelium**, which results in pleural and peritoneal effusion. Usually, the effusion has a **high protein (5-12 g/dL)** and is **low in cellularity**. The predominant cells are **neutrophils**. The fluid may be clear to yellow and contain fibrin clots. Given the low cellularity, neoplasia is lower on your list. FeLV and FIV do not usually present with pleural effusion.

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## Question

Which of the following are not efficacious methods for diagnosing feline infectious peritonitis?

- Serology and histopathology
- Histopathology and 7B protein ELISA test
- Immunohistochemistry and RT-PCR
- Serology and 7B protein ELISA test
- RT-PCR and 7B protein ELISA test

**Explanation** - The correct answer is serology and 7B protein ELISA test. Some FIP viruses do not have the 7B protein. So, this test is not specific for FIP virus. Immunohistochemistry or RT-PCR can be used to demonstrate virus on biopsy specimens (RT-PCR does not work on serum or feces). However, this is not always necessary because **histopathology (the gold standard for antemortem diagnosis of FIP)** can show characteristic lesions of **disseminated pyogranulomatous and fibrinonecrotic reaction around small veins**. If you can't remember any of these at least remember that **corona titers are completely useless!** They will only tell you if the cat has been exposed to a corona virus. Most cats have been exposed to a corona virus at some point in their lives. So the best choice is serology and the 7B protein ELISA test since neither of these are efficacious.

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## Question

A 2-year old male neutered Ragdoll presents for inappetance, weight loss, and has a **104F** temperature. The abdomen also appears slightly distended. A mid-abdominal small mass effect is

palpated. A complete blood count shows a hematocrit of 31%, WBC count of 25,678/ul (**increased**), and 210,000 platelets/ul. A serum chemistry shows a creatinine=1.8 mg/dl, blood urea nitrogen (BUN)=30 mg/dl, glucose= 70 mg/dl, albumin=2.1 g/dl, **globulin=6.4 g/dl**, ALT=59 IU/L, and total bilirubin=0.2 mg/dl. You perform an abdominocentesis and collect a yellow-tinged fluid with a total protein of 6.2 mg/dl. No bacteria are seen on cytology of the fluid. What should tell the owner?

- The cat will likely respond to treatment, but the owner should check her house carefully for rodenticides
- Immediate euthanasia and necropsy is indicated to rule out a zoonotic pathogen
- The cat's likely prognosis is grave. Therapeutic intervention is unlikely to benefit.
- An emergency exploratory laparotomy is indicated

**Explanation** - The cat's likely prognosis is grave. Therapeutic intervention is unlikely to benefit. Based on the cat's age on findings, Feline Infectious Peritonitis is the likely diagnosis, a disease caused by a coronavirus. It causes infiltration of the organs with inflammatory tissue called **pyogranulomas**. This can lead to organ failure, fever, effusions of the abdomen or chest cavity (known as the "wet" form of the disease), or neurologic and other signs (seen with the "dry" form of the disease).

The disease is more common in **purebred cats**, and, cats that have been in **catteries** or shelters; it most often affects **younger cats**, although older cats can also succumb to the disease. The theory is that the coronavirus, to which most cats are exposed, mutates in some cats and leads to the syndrome of FIP. Feline Infectious Peritonitis is felt to have **a 100% mortality**. Diagnosis can be difficult, and results of coronavirus antibody titers have to be interpreted in light of clinical symptoms, since most cats have been exposed to coronavirus.

Clinical symptoms of the disease can include general malaise, inappetance, weight loss, fever, icterus, abdominal effusion or pleural effusion, neurologic signs, uveitis, or organomegaly. **Hyperglobulinemia** and an **inflammatory leukogram** are often noted on bloodwork. The **sterile effusions** are typically sticky and clear to straw-colored or yellow-tinged and contain **high protein**. Granulomas or sometimes enlarged reactive lymph nodes can be palpated in the mesentery on physical exam. The clinical symptoms listed in this question can also be seen with an **intestinal perforation**; however, when this occurs, bacteria are usually seen on cytology of the abdominal fluid.

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## Question

Dolly, a 3-year old female spayed Siamese mix, presents with a history of **weight loss** over the last month. She is now **vomiting** occasionally and has a decreased appetite over the last 2 weeks. She has not eaten in the last 2 days. She is current **on vaccines**. **Temperature** is 103.7 F. You can palpate an abdominal mass effect in the mid to caudal abdomen. You believe the cat has a foreign body and are concerned about a possible intestinal perforation. Abdominal tap is negative. Pre-anesthetic bloodwork shows neutrophils 25,000 /ul, bands 3,000 /ul, globulins 6.9 g/dL. Your x-ray machine is not working today and you recommend an abdominal exploratory. Upon exploratory, the intestines are severely hyperemic and the mesenteric lymph nodes are greatly enlarged. You cannot find a foreign body and no perforations are seen. There is a small amount of yellow tinged sticky ascites. What do you do?

- Biopsy the lymph node and intestine and discuss a poor prognosis with the owner
- Refer to an oncologist for work up of gastrointestinal lymphoma
- Euthanize the cat on the table since you are unable to reach the owner over the phone about the poor prognosis
- Start the cat on prednisolone and hypoallergenic diet for severe inflammatory bowel disease

**Explanation** - Biopsy the lymph node and intestine and discuss a poor prognosis with the owner. This cat most likely has Feline Infectious Peritonitis, or FIP, which is caused by a mutation of a feline corona virus. Fever, weight loss, and gastrointestinal symptoms are the most frequent presentation. However, this virus may attack multiple organs and can be difficult to diagnose; the only definitive way to diagnose this disease is via **histopathology**. Clinical symptoms, blood results, and corona virus titers can all be used in combination to help aid in the suspected diagnosis of FIP. Unfortunately, there is no cure for this disease and it is currently considered a fatal disease.

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### Question

A 2-year old female DSH cat presents for weight loss, anorexia, dyspnea, and lethargy. She was previously treated with antibiotics but is still febrile on physical exam. You detect pleural effusion and notice that the abdomen is distended. On CBC, there is a non-regenerative anemia, neutrophilia, and lymphopenia. On chemistry there is hyperproteinemia and a slight elevation in liver enzymes. Spread of the virus that leads to this disease usually occurs from which route of transmission?

- Respiratory secretions
- Aerosol transmission
- Mucous membranes
- Fecal-oral transmission

**Explanation** - The case describes a cat with the wet form of feline infectious peritonitis (FIP). The primary source of infection of the FIP virus is due to **fecal-oral transmission**. Eventually, feline corona virus mutates to a virulent feline infectious peritonitis virus which is **able to multiply in macrophages**. Ideally, a strong cell-mediated immune response eliminates the virus, but in some cats, the infection can become latent and is reactivated with stress. If a cell-mediated immune response is not mounted, **pyogranulomatous vasculitis** will occur due to the deposition of antigen-antibody complexes in the venous endothelium. Complement-mediated inflammation results in pleural and peritoneal effusion (wet form) and partial cell mediated immune response results in slow viral replication with granuloma formation (dry form).

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### Question

You see an 8-month old kitten with the effusive form of feline infectious peritonitis and perform euthanasia. The kitten was having severe diarrhea around the house when it became ill. The owner has a 2 year old cat at home and wants to know what this cat's prognosis is since it has been exposed to the sick kitten. Currently this cat is clinically healthy. What do you tell her?

- Her other cat may develop symptoms within the next two weeks because FIP is highly contagious
- You recommend a coronavirus titer to determine if the cat is actively infected
- Feline infectious peritonitis is not contagious and because her other cat died of FIP does not mean this cat will succumb to the disease
- Place the cat on L-lysine to prevent or suppress any infection with FIP
- Perform a PCR on the cat's feces to see if the virus is being shed

**Explanation** - Feline infectious peritonitis is not a contagious disease. It is a disease that is caused by a mutation of feline enteric coronavirus. It is unknown why in some patients this virus mutates and causes the FIP syndrome. It is most likely to occur in young or immunocompromised cats. Her other cat is not necessarily going to get FIP just from exposure. In fact, the majority of the cat population has been exposed to the feline enteric coronavirus.

Because most cats in the general population have been exposed, it makes interpretation of coronavirus titers difficult. The titers can be elevated due to prior exposure and not from FIP. The titers can only be interpreted in lieu of clinical signs, blood results, etc.

L-lysine is an anti-viral medication that may have some benefit for suppression of herpes virus but would not be a prevention or treatment choice for coronavirus.

The coronavirus is shed in the cat's feces during active infection with coronavirus. Some infected cats do not shed the virus. The virus attacks the intestinal tract and causes GI upset. PCR on the feces would detect coronavirus, but does not distinguish between the enteric coronavirus and the mutated FIP form of the virus.

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## Question

A woman brings her two cats into your clinic. She is worried because she has a young daughter who loves to play with her cats but she is concerned about Bartonella transmission resulting in cat scratch disease. You perform culture, PCR, and Western Blot on her cats, and those tests are negative. Which of these measures would be the most important way to decrease the chance of her cats acquiring Bartonella from another cat?

- Strict flea control measures
- Monthly heartworm medication (ivermectin)
- Preventing bites or scratches from other cats
- Frequently clean the litterbox
- Spaying them to prevent sexual activity

**Explanation** - While transmission of Bartonella from cats to humans is primarily via scratches and occasionally bites, the same is not true for cat-to-cat transmission. Arthropod vectors are the main mode of transmission, particularly the **cat flea**, *Ctenocephalides felis*. Direct transmission from cat-to-cat or vertically from queen to kitten in a flea-free environment is very unlikely.

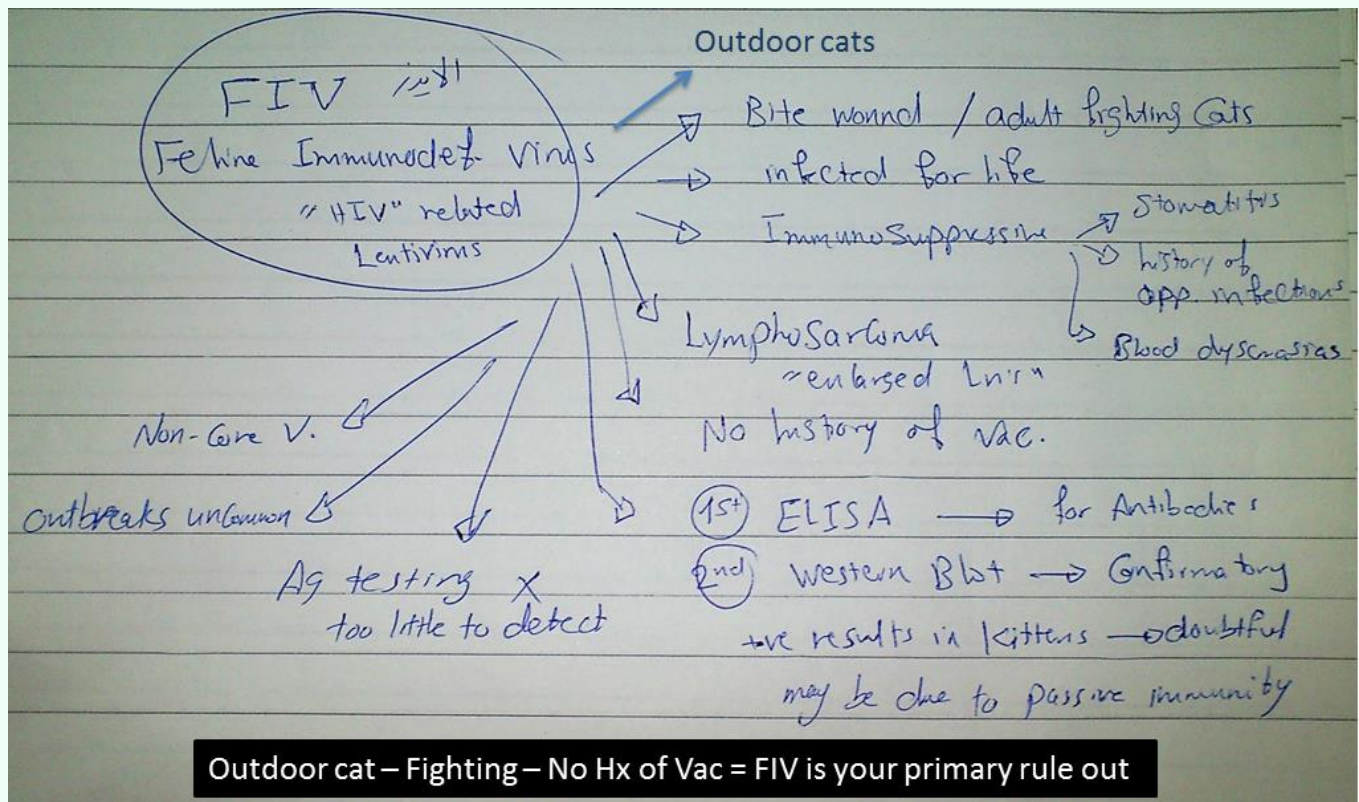
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## Question

Which cell type is least likely to be infected by feline immunodeficiency virus?

- Cytotoxic T-cell (CD8+)
- T helper (CD4+)
- Macrophage
- Platelet
- B cell

**Explanation** - The correct answer is platelet. All are affected except for the platelet. After inoculation, replication occurs in **lymphoid and salivary tissues**. Eventually, the virus spreads to mononuclear cells, while viremia is suppressed by the host immune response (asymptomatic carrier phase) that can last several years. A slow decline in the number of CD4+ cells is seen, resulting in failure of the immune system. Cats are often about 10-15 years old by the time this occurs.



## Question

What is the main mode of transmission for feline leukemia virus?

- Shedding of virus via saliva
- Aerosol transmission
- Fomite transmission

- Shedding of virus via feces

**Explanation** - The correct answer is **shedding of virus via saliva**. The main mode of transmission is via **saliva**. It requires prolonged, close contact. Cats may shed the virus for months to years. Transmission may also occur through reuse of instruments and blood. Virus is shed in saliva, tears, urine, and feces.

**FELV** transmitted by close contact (saliva)

↳ **C.S.**

- ↳ Lymphadenopathy
- ↳ opportunistic (↓ Immunity)
- ↳ Stomatitis, gingivitis
- ↳ Emaciation
- ↳ Lymphoid depletion

Young cats more presented

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**Testing for FELV**

- \* Antigen testing (reliable)
- If +ve → Retesting in 1-3 months

(Why) 98% of cats develop transient infection & test +ve then they eliminate the virus & become Ag Negative

**Vaccine** Non-Core vaccine  
Given to at-risk animals only  
⇒ two Inj & annual booster  
VAC Not result in +ve test

**FIV** Bite transmission

- ↳ Lifetime carrier
- ↳ C.S. → Same as FELV

Lymphadenopathy + oral lesions + opp. Int + Emaciation + Blood dyscrasias in Adult, Fighting, outdoor cats

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**Testing for FIV**

- \* Antibody testing
  - ↳ ELISA
  - ↳ Western Blot (confirmatory)
- +ve test results in kitten → doubtful (due to passive immunity)
- \* No Ag testing → too little to detect

**Vaccine** 3 Inj (booster annually)  
Non-Core VAC.  
VAC will result in +ve test on all commercially available tests

### Question

A 1-year old male neutered Siamese presents to you with the clinical signs seen in the image. He is an indoor only cat and the owners recently adopted an 8 week old kitten that he is in contact with. His clinical signs were initially mild and unilateral but progressed to these findings three days later. What are the two most likely pathogens affecting this cat and what is the treatment of choice?



- Chlamydophilia felis and Corynebacterium Spp., topical prednisone acetate
- Feline Herpesvirus-1 and Chlamydophilia felis, topical tetracycline
- Mycoplasma felis and Feline Calicivirus, oral amoxicillin
- Feline Calicivirus and Chlamydophilia felis, oral clavamox
- Feline Calicivirus and Feline Leukemia Virus, topical trifluridine

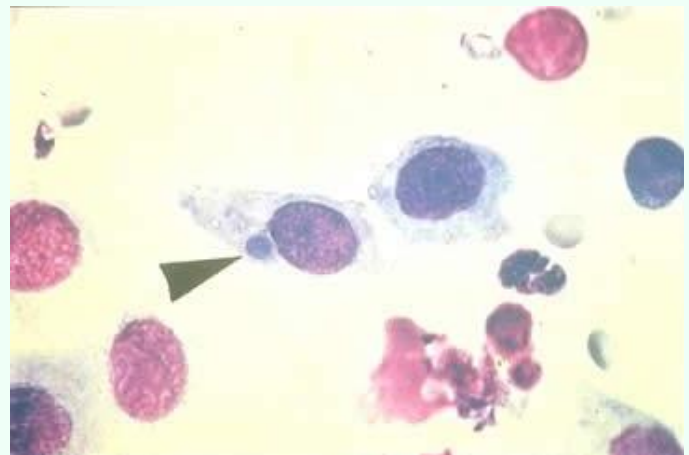
**Explanation** – The correct answer is Feline Herpesvirus-1 and Chlamydophilia felis.

The most common cause of bacterial conjunctivitis in feline patients is **Chlamydophilia felis**. This disease cannot be distinguished from feline Herpesvirus-1 based on clinical appearance alone.

Frequently, feline patients with these symptoms are infected with both of these diseases simultaneously.

Diagnosis of Chlamydophilia felis is made by visualizing typical **inclusion bodies** in the cytoplasm of conjunctival epithelial cells or obtaining a **positive fluorescent antibody** (FA) test on a conjunctival scraping.

The treatment of Chlamydophilia felis is **topical tetracycline QID** for one week post resolution of clinical signs.



## Question

What is the most common cause of Cat Scratch Disease in humans?

- Bartonella quintana
- Clostridium perfringens
- Bartonella henselae
- Borrelia burgdorferi

**Explanation** - The correct answer is Bartonella henselae. Usually, you will see a papule at the site of inoculation followed by fever and local lymphadenopathy one week later. The lymphadenopathy will last months but is self-limiting. Neat! Cats are generally asymptomatic. B. quintana is the cause of Trench Fever in humans, which is transmitted by the human louse. Borrelia burgdorferi is the causative agent of Lyme disease.

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## Question

What is NOT a feature of herpes viral infection?

- Symblepharon
- Lingual ulceration
- Dendritic ulcers
- Facial dermatitis
- Response to lysine supplementation

**Explanation** - **Lingual ulceration is not a feature of herpes viral infection, but is a feature of another upper respiratory virus of cats, calicivirus.**

Symblepharon is adhesion of part of the conjunctiva onto the cornea/limbus in cats with herpes induced epithelial erosions. Dendritic ulcers (superficial branching ulcers seen with Rose-bengal staining) are pathognomonic for herpes.

Lysine supplementation may help inhibit the replication of the herpes virus.

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## Question

What are the main vectors of tularemia?

- Mosquitoes
- Ticks
- Stable flies
- Fleas



**Explanation** - The correct answer is **ticks**. Cats and dogs can also be infected following contact with other animals such as rodents and especially **rabbits**. This is zoonotic and a potential biological warfare agent. **Dogs are relatively resistant to tularemia.** Cats show depression, fever, anorexia, general lymphadenopathy, and oral ulceration. Humans have three forms of the disease, ulceroglandular, pneumonic, and typhoidal.

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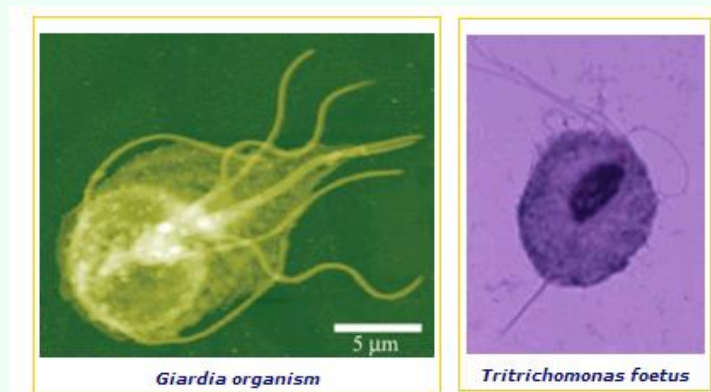
### Question

Which statement regarding *Tritrichomonas foetus* infection in cats is FALSE?

- *T. foetus* can be detected best by culture or PCR testing and can be identified on a wet mount
- Not all infected kittens or cats will have symptoms of diarrhea
- **If *T. foetus* is not identified and treated properly, it will cause small bowel diarrhea indefinitely**
- Ronidazole given at 20mg/kg po q 24 hours x 14 days is an effective treatment

**Explanation** - *T. foetus* is a protozoal infection that **causes large bowel diarrhea in cats**. It typically affects **young cats**; even if left untreated, most cats will outgrow their symptoms within 2 years. *T. foetus* resembles *Giardia* on a wet mount but can be distinguished from *Giardia* by its "falling leaf" pattern.

Ronidazole is the most effective drug available to treat this infection. It should be used only at recommended doses as it can cause neurotoxicity at higher doses. Not all cats with this infection have symptoms as some cats may be asymptomatic carriers.



### Question

A 3-month old healthy kitten tests positive for FELV (feline leukemia virus) on your in-house ELISA. What do you tell her about her kitten?

- An IFA (indirect fluorescent antibody) should be submitted. If it is negative, then the kitten is not infected with FELV.
- If the ELISA is repeated again in 3 months and it is negative, then the kitten is not infected with FELV.

- The kitten has FELV and is expected to have a shortened life expectancy and is contagious to other cats.
- An IFA (indirect fluorescent antibody) should be submitted. If it is positive as well, the kitten is truly infected with FELV.

**Explanation** - If the ELISA is repeated again in 3 months and it is negative, then the kitten is not infected with FELV. FELV is a retrovirus and it is transmitted both horizontally and vertically in the cat. Once a cat is exposed, the virus is propagated through the tissues (from lymphoid tissue which then results in amplification in the spleen, lymph nodes, GALT, intestinal crypt epithelia, and bone marrow). Once the bone marrow is infected, peripheral viremia occurs by infected neutrophils and platelets being released. Finally, excretion of the virus does not occur until **28-56 days after infection**, once there is widespread infection of epithelial and glandular tissue which will excrete the virus in saliva and urine.

The ELISA tests for the p27 virus antigen in the serum. The IFA (indirect fluorescent antibody) tests for p27 antigen in leukocytes and platelets.

Because the virus can be neutralized in some cats before progression/amplification in the body, a positive ELISA may eventually turn negative after a few weeks (in this situation, the IFA will remain consistently negative). If there has been propagation of the virus to the bone marrow then the IFA will be positive.

If you have a **positive ELISA test with a negative IFA**, it is important to **re-test the ELISA again in 3 months** to see whether virus neutralization occurred.

Unfortunately, in some cats, an ELISA turning negative 3 months later does not prove that the pet has overcome the infection. Some cats will sequester the virus in their bone marrow resulting in only a positive IFA.

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## Question

A kitten presents with watery diarrhea. On fecal examination, a wet mount shows motile protozoal trophozoites and a centrifugal zinc sulfate fecal flotation shows cysts of the parasite. Which of the following is the most acceptable treatment?

- Pyrantel
- Metronidazole
- Albendazole
- Praziquantel

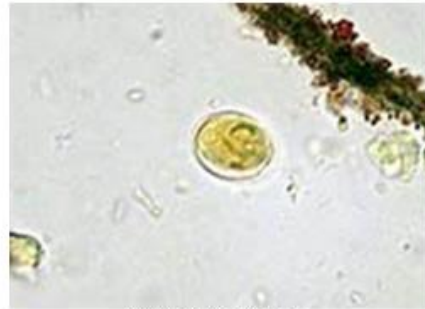
**Explanation** - The diagnostic test findings for this cat are consistent with Giardia infection. Metronidazole has been shown to be effective at clearing the pathogen and reducing cyst shedding of this zoonotic disease. Care should always be taken with metronidazole in kittens due to potential side effects. Fenbendazole, or Panacur, is another treatment option for Giardia, especially for dogs, but efficacy has not been extensively evaluated in cats. Albendazole has greater hematologic toxicity than fenbendazole and should not be used in cats. Pyrantel is used to treat hookworms and roundworms. Praziquantel is used to treat tapeworms.

*Giardia lamblia* is a flagellated protozoan parasite of man. Only 2 stages i.e. the trophozoite and the cyst forms are observed in the life cycle of *Giardia*. The *Giardia* infection is acquired from drinking water or by eating food which is contaminated with cysts. The symptoms of the *Giardia* infection are foul smelling diarrhea, flatulence, steatorrhea, etc. Stool samples from the patients are examined for the detection of the motile trophozoites and cysts. As the trophozoites disintegrate rapidly, the stool sample should be observed within 15 minutes of its passage.

- ▶ Trophozoite—motile stage in small intestine
- ▶ Cysts—resistant stage for environmental transmission



Trophozoite of *Giardia* sp.  
(iodine stain)



Cyst of *Giardia* sp.  
(iodine stain)

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### Question

Which of the following is the most common cause of Bartonellosis in cats in the United States?

- *B. vinsonii*
- *B. clarridgeiae*
- *B. henselae*
- *B. quintana*
- *B. weissii*

**Explanation** - The correct answer is *Bartonella henselae*. *B. quintana* is the cause of Trench Fever in humans which is transmitted by the human louse. *B. clarridgeiae* and *B. weissii* are other species that can infect cats, but not as often. *B. vinsonii* has been associated with endocarditis in several dogs.

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### Question

What is the classic lesion seen with feline infectious peritonitis?

- Cellular degeneration
- Negri bodies
- Pyogranulomatous vasculitis
- Vascular cuffing

- No classic lesion observed

**Explanation** - The correct answer is pyogranulomatous vasculitis. Good job if you picked it. Pyogranulomatous vasculitis will occur due to the deposition of antigen-antibody complexes in the venular endothelium. Complement-mediated inflammation results in pleural and peritoneal effusion (wet form) and partial cell-mediated immune response results in slow viral replication with granuloma formation (dry form). Negri bodies may be seen with rabies. Cellular degeneration and vascular cuffing are seen with many disease processes.

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### Question

A 5-year old female spayed cat presents to you with the primary complaint of lethargy. You perform bloodwork and find a hematocrit of 16%. The anemia is regenerative with 3.5% reticulocytes. PCR is positive for circulating DNA of *Mycoplasma haemominutum*. Which drug is effective for treatment of *Mycoplasma*?

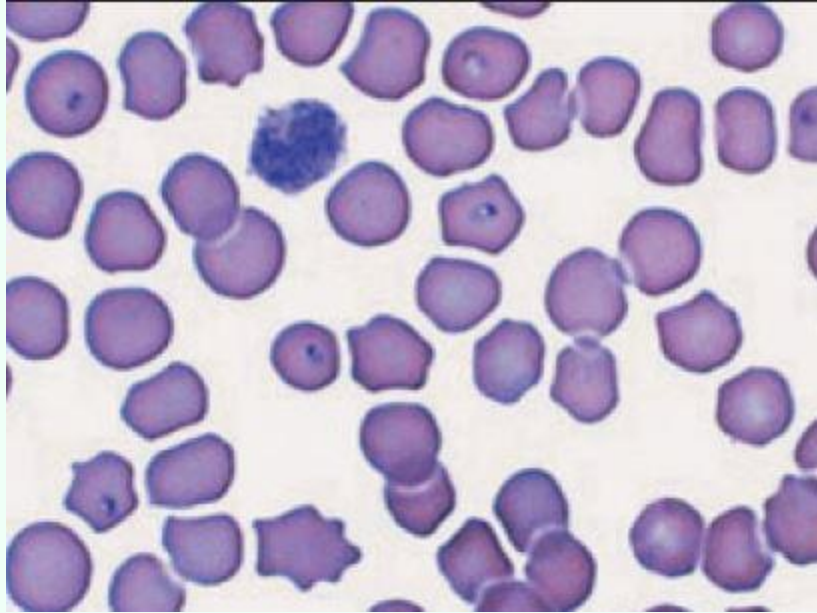
- Clavamox
- Doxycycline
- Cyproheptadine
- Itraconazole
- Metronidazole

**Explanation** - Acceptable treatment options for mycoplasma in cats are **doxycycline** and **enrofloxacin**. Cats should be treated for 3 weeks in most cases. Remember that doxycycline can cause esophageal stricture in cats, and administration should be followed by water. This therapy should be effective in most cases but often does not completely eliminate the organism from the body, and cats may remain carriers of the pathogen.

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### Question

A 6-year old indoor/outdoor female spayed Siamese presents to you for a 2 day history of anorexia, lethargy, and **dyspnea**. On presentation the cat has **icteric** mucous membranes, a grade II/VI left parasternal heart **murmur**, and a temperature of **104.4F**. Initial bloodwork showed a normochromic, normocytic non-regenerative **anemia** with concurrent **thrombocytopenia**. A blood smear revealed the following organisms (seen in the picture). The owner has 3 other cats at home. What is your diagnosis and what would your recommendation be for the owner?



- Cytauxzoon felis; diligent tick preventative application and restrict access to the outdoors
- Cytauxzoon felis; have the other cats tested since they have been around the sick one
- Mycoplasma haemofelis; have the other cats tested since they have been around the sick one
- Mycoplasma haemofelis; diligent tick preventative application and restrict access to the outdoors

**Explanation** - Cytauxzoon felis is a tick borne disease prevalent in the southern states. Cats typically present with a marked pyrexia, icterus or pallor, anemia associated heart murmur, and thrombocytopenia.

This disease should be differentiated from Mycoplasma haemofelis as treatment and prognosis vary greatly. Both organisms infect erythrocytes and it can sometimes be difficult to distinguish between the two.

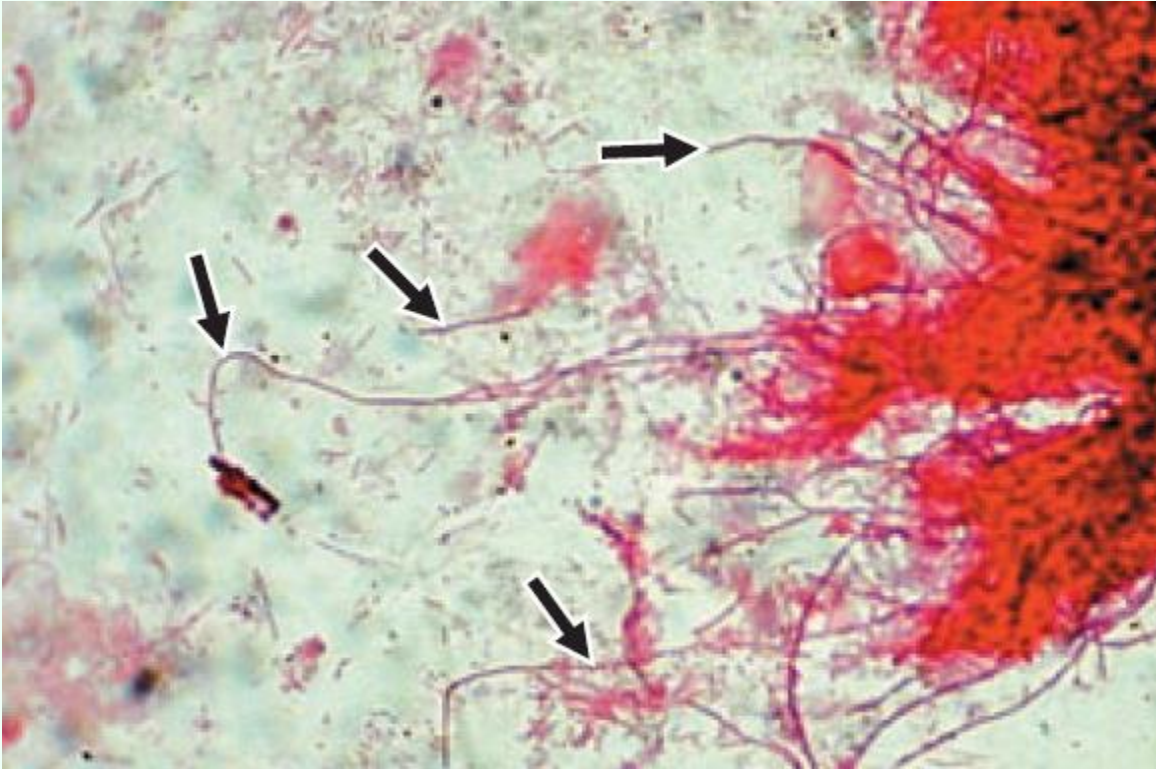
Cytauxzoon is a protozoal organism that characteristically has a signet ring shape with a prominent nuclear area as seen in the image. Mycoplasma haemofelis is a bacterial parasite that can appear as cocci, rings, or rods. There is no effective treatment for Cytauxzoon infection, so prevention should be the goal. Cats should be kept indoors to limit exposure to ticks and tick preventative should be applied consistently.

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### Question

A 10-year old spayed female barn cat presents with **dyspnea** and **cyanosis**. Based on your physical exam, you suspect pyothorax. Thoracocentesis yields a foul-smelling purulent material. You make a smear of the exudate and perform a Gram stain. The cytology is shown below (100X objective) and you see the Gram-positive branched filamentous rods identified by the arrows. Based on this

finding, you suspect that the cat has an infection with either *Actinomyces* spp. or *Nocardia* spp. Which of the following tests would differentiate the two?



- Silver stain
- Potassium hydroxide preparation (KOH test)
- Trypan blue exclusion test
- Congo red stain
- Acid-fast stain

**Explanation** - Acid-fast staining is used to differentiate specific types of bacteria known as acid-fast organisms. Acid-fast stain is most commonly used to look for **Mycobacteria**, which are acid-fast. **Nocardia and some bacterial spores and coccidian parasites** are also acid-fast. In this case, an acid-fast stain would differentiate *Nocardia* (which is acid-fast) from *Actinomyces* (which is not acid-fast).

A KOH test is used to aid in the diagnosis of fungal infection, usually cutaneous infections from dermatophytes. Congo red stain is typically used to stain for amyloid fibrils and may sometimes be used to identify a specific type of *Shigella*. Trypan blue is a cellular viability stain. Silver staining is used to identify proteins, commonly type III collagen. It may also be used to identify certain fungal organisms.

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## Question

A 10-year-old indoor/outdoor male castrated domestic short-hair cat presented to you for a 4-day history of lethargy and anorexia after the owner removed a tick found on the cat's hind leg. On physical exam, you notice scleral hemorrhage (see picture) and hepatomegaly. The cat has a temperature of 105.2F and is markedly dehydrated and icteric. Bloodwork revealed a normochromic, normocytic, non-regenerative anemia and thrombocytopenia. Blood smear showed signet ringed shaped organisms within erythrocytes. What treatment would you recommend to the owner and what is the prognosis?



- Intravenous fluids, prednisolone, blood transfusion; grave
- Prednisolone, blood transfusion, doxycycline; fair
- Placement of an esophagostomy tube and feeding therapy, blood transfusion; fair
- Intravenous fluids, heparin therapy, blood transfusion; grave

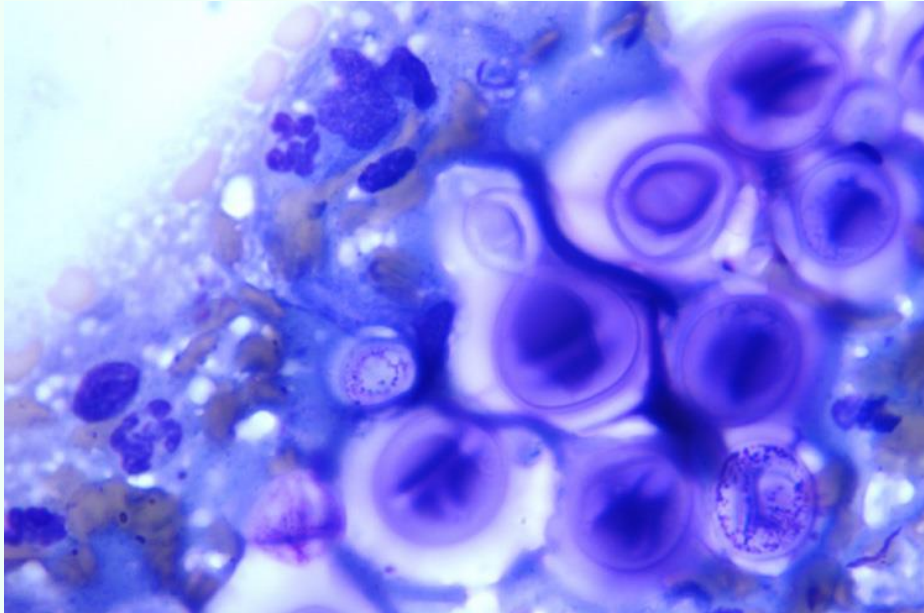
**Explanation** - *Cytauxzoon felis* is a protozoal organism and transmission to cats is through tick bites. Cats usually show clinical signs 1-3 weeks after infection. Signs can be non-specific and include anorexia, lethargy, dyspnea, and icterus. Cats will also commonly have a marked pyrexia. The organism invades the reticuloendothelial cells of the lungs, spleen, liver, lymph nodes, and other organs so cranial organomegaly can often be present. The bone marrow can be affected causing pancytopenias. Thrombocytopenia is likely related to the development of disseminated intravascular coagulation, which can cause spontaneous bleeding. **There is no effective therapy and prognosis is poor to grave.** Treatment is mainly supportive and involves **IV fluids** to maintain tissue perfusion and to correct dehydration, **blood transfusions** to improve the anemia and oxygen carrying capacity of the blood, and **heparin** therapy for **prophylactic treatment of DIC.**

Anti-protozoal medications such as imidocarb have been used with varying success. Corticosteroids and antibiotics such as doxycycline, enrofloxacin, and marbofloxacin are commonly used to treat *Mycoplasma haemofelis*, but they are ineffective against *Cytauxzoon*. Immune mediated hemolytic anemia, cholangiohepatitis, and FIP should also be considered as differentials.

---

### Question

A 3-year old female spayed indoor/outdoor domestic short hair presents for congestion and swelling over the bridge of the nose. The swelling over the nose is firm and seems to be subcutaneous. There is also mild enlargement of the mandibular lymph nodes. You perform cytology from a fine needle aspirate of the swelling over the nose and see narrow, budding, thin-walled yeasts surrounded by clear capsules (see picture). You also detected a lesion in the retina on fundic examination. Which of the following treatments would be indicated?



- Trimethoprim sulfa
- Amoxicillin-clavulanic acid
- Lufenuron
- Itraconazole
- Doxycycline

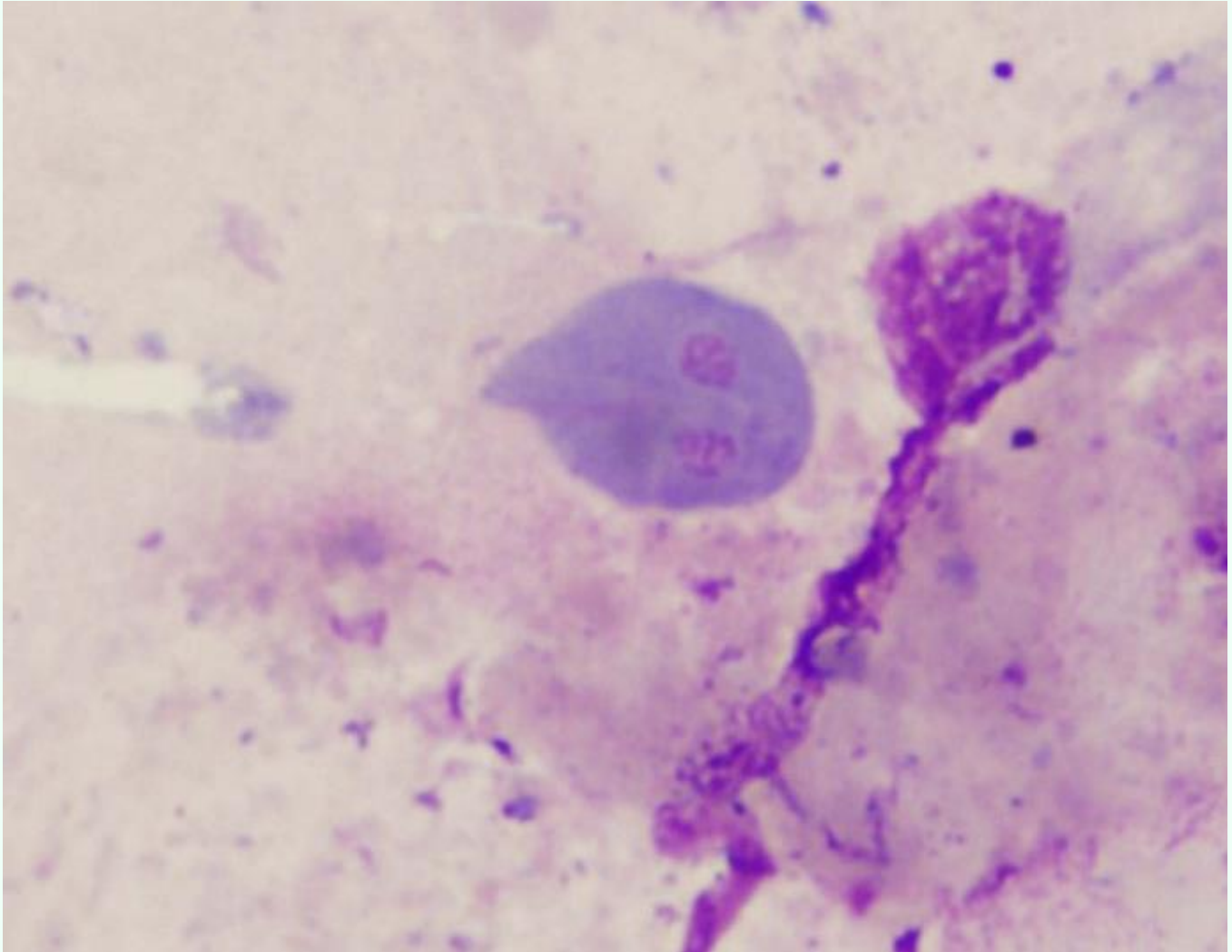
**Explanation** - Based on the description of the cytology and clinical symptoms of this cat, the most likely diagnosis is *Cryptococcus neoformans*. This is a fungal disease that occurs when the organism is inhaled and is disseminated to skin, eyes, CNS, lungs, or other areas. The upper respiratory tract is most often involved and symptoms can include nasal discharge, sneezing, swelling over the nose, and regional lymphadenopathy. If the CNS is involved, seizures can also occur. The disease has been thought to be transmitted most often through infected pigeon droppings. Itraconazole or fluconazole are the anti-fungals of choice for this disease. Doxycycline, Trimethoprim sulfa, and Clavamox are all antibiotics and would not address a fungal infection. Lufenuron is a flea treatment that has had some implications for treatment of dermatophytes due to its ability to inhibit chitin. About 1/3 of the cell wall of a fungus is composed of chitin. This has not been a promising or approved treatment for ringworm and surely would not be an appropriate treatment for *Cryptococcus*.

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### Question

A 5-month old female cat presents to you for weight loss, chronic diarrhea and steatorrhea. The organism seen in a stained fecal smear is shown in the image below (this is a magnified 40X image, the organism is approximately 15 x 8 um). Which treatment is most appropriate?



- Sulfadimethoxine
- Tylosin
- Fenbendazole
- Penicillin

**Explanation** - The organism is Giardia which can be recognized as a trophozoite with two nuclei outlined by adhesive discs. Giardia should be distinguishable from trichomonads which have a single nucleus and an undulating membrane.

The best treatments for Giardia are either **fenbendazole** or **metronidazole**.

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### Question

Which of the following is the causative agent of Feline Infectious Anemia?

- Mycoplasma haemofelis
- Cytauxzoon
- Hemophilus somnus
- Anaplasma marginale

**Explanation** - The correct answer is Mycoplasma haemofelis. Recent studies show that this is a Mycoplasma, and that is why it is no longer called Haemobartonella felis. Cytauxzoon is a protozoal organism that also causes anemia, but differs in morphology. Anaplasma marginale is an intracellular rickettsial organism of erythrocytes of cattle that causes bovine anaplasmosis.

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### Question

A 4- year old female spayed domestic short haired cat presents for a cough of 3 weeks duration. All of these diseases can result in dyspnea and cough. Which one has the potential to cause acute death?

- Paragonimus kellicotti
- Aelurostrongylus abstrusus
- Dirofilaria immitis
- Capillaria aerophila

**Explanation** - The answer is Dirofilaria immitis. Cats with Heartworm may be asymptomatic but common clinical signs include a peracute presentation due to worm emboli/migration. Chronic signs such as anorexia, weight loss, lethargy, and exercise intolerance may be seen occasionally. Heart failure, cough, and dyspnea can occur with this disease but often are not present due to the small worm burdens usually carried by cats. Aelurostrongylus, Capillaria, and Paragonimus are lung parasites that can all cause coughing in a cat.

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### Question

A 3 year old indoor/outdoor MN feline presents to your clinic because the owner saw "some white rice-looking things" around his anus. They were small and flat and seemed to be moving. Some of them were dried up. Which of the following treatments would be best?

- Praziquantel (Droncit)
- Fipronil (Frontline)
- Selamectin (Revolution)
- Pyrantel (Strongid)
- Fenbendazole (Panacur)

**Explanation** - This cat likely has a tapeworm infection. Tapeworm segments are typically flat and white and small, resembling a grain of rice. The most common tapeworms in cats are **Taenia taeniaeformis and Dipylidium caninum**. The only medication that will treat both types is praziquantel.

Praziquantel is in the products Drontal Plus and Profender, approved for the use in cats. Drontal Plus also contains pyrantel. Profender also contains emodepside. Both are also effective against roundworm and hookworm.

Pyrantel is not effective against tapeworms and treats hookworm and roundworm infection. Fenbendazole (or Panacur), treats Taenia but not Dipylidium, and also treats hookworm, roundworm, and whipworm infection.

Revolution treats and prevents hookworm, roundworm, heartworm, fleas, and ear mites in cats. Frontline treats and prevents fleas and ticks. A flea control should be recommended since Dipylidium is transmitted by ingestion of an infected flea. Taenia is transmitted through eating an infected prey.

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### Question

A cat with a Cryptococcus infection and liver failure should not be treated with ketoconazole for which of the following reasons?

- It causes hypoadrenocorticism in cats
- It is not effective in treating Cryptococcus
- It is hepatotoxic and causes vomiting and diarrhea in cats
- It is renal-toxic to cats

**Explanation** - The correct answer is it is **hepatotoxic and causes vomiting and diarrhea in cats**. Ketoconazole is an azole antifungal. It is effective against Cryptococcus, but it causes severe GI upset and anorexia, particularly in cats. It is also hepatotoxic, making it a poor choice for the cat described in the question.

**Cryptococcosis** (Public Health - Dried pigeon manure - Inhalation - more common in cats - URT infections - Nasal/Facial deformity - Skin lesion - Ocular signs - CNS signs - CSF tap - Cytology of exudate - Itraconazol/Fluconazol/Amphotericin B - Guarded prognosis and Poor if CNS involvement - prolonged Tx - Relapses occur)

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### Question

A 2-year old indoor-outdoor female spayed domestic short hair cat presents to you for inappetence and vomiting. The cat vomits and the contents include several **3 cm long nematodes** with spine-covered heads. You are able to identify the worms as Gnathostoma. Which of the following is true about these worms?

- The parasite is typically found in dry, dusty environments
- The parasite does not cause disease in humans

- The life cycle involves a flea intermediate host
- Proper disposal of feces eliminates the threat of transmission to other animals
- The life cycle involves a rodent intermediate host

**Explanation** - The life cycle of *Gnathostoma* involves a small copepod intermediate host (similar to *Dracunculus* worms). Copepods are small **crustaceans** that are found in freshwater habitats (i.e. ponds). Eggs passed in the feces are not infectious unless first ingested by copepods so **proper disposal of feces prevents transmission to other animals**.

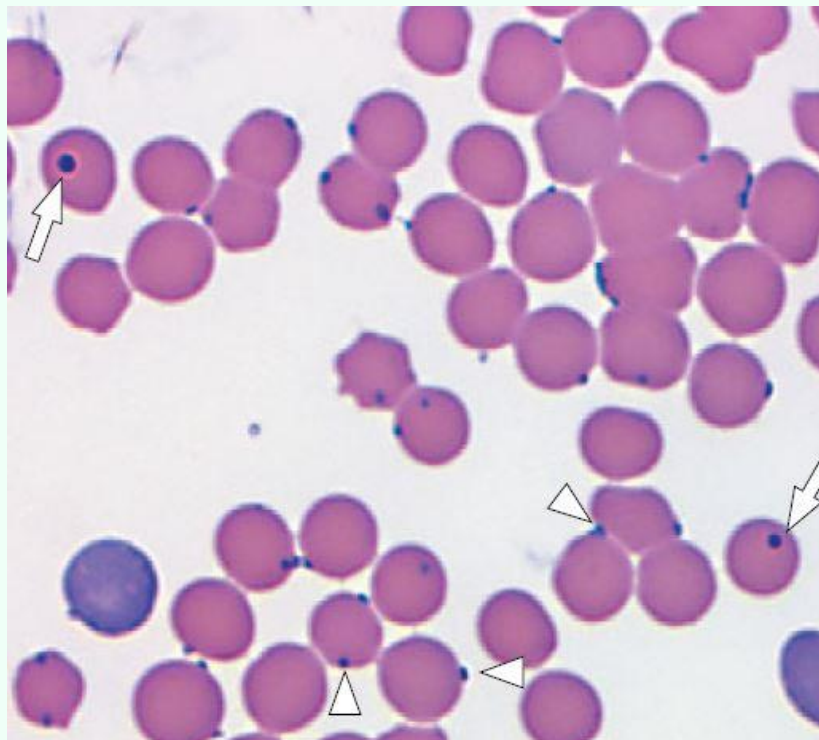
Adult worms live in the mucosa of the stomach and cause **gastritis**. They can also create nodules in the stomach which can ulcerate and lead to severe peritonitis. **Human cases of gnathostoma usually occur from ingestion of undercooked fish** or other animals and can cause gastritis or peritonitis. Larva may undergo cutaneous or neural migration (rare).

Control is typically achieved by preventing cats from hunting in areas where the parasite is found. It is thought that albendazole is effective against gnathostomiasis.

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### Question

A 7-year old female spayed domestic short hair cat presents to you for an annual exam. The cat has had a slightly decreased appetite and has been lethargic. You perform a complete blood count and a chemistry panel. The chemistry panel is within normal limits. The complete blood count shows a **hematocrit of 25%** (normal 30%-50%). The image below is what you see on the blood smear. The arrows are pointing to Howell-Jolly bodies and the arrowheads are pointing to *Mycoplasma haemofelis* organisms. What do you tell the owner?



- The Howell-Jolly bodies are a sign of having been fed onions and garlic, which is causing the anemia. The Mycoplasma is also contributing to the anemia and should be treated.
- The Howell-Jolly bodies are a sign of ingestion of acetaminophen and are a sign of the anemia. The Mycoplasma is also contributing to the anemia and should be treated.
- The Howell-Jolly bodies are an insignificant finding. The Mycoplasma is likely causing the anemia and should be treated.
- The Howell-Jolly bodies are an insignificant finding. The Mycoplasma is also an insignificant finding. The anemia is unrelated to either of these findings.

**Explanation –** The correct answer is The Howell-Jolly bodies are an insignificant finding. The Mycoplasma is likely causing the anemia and should be treated. Howell-Jolly bodies are small spherical nuclear remnants that are left behind when the nucleus of a red blood cell is expelled during maturation. They are found in low numbers in normal horses and cats. They can be increased in animals that are receiving glucocorticoids as well as chemotherapy agents.

**Ingestion of acetaminophen, onions, and garlic cause Heinz body anemia.** Heinz bodies may look similar to Howell-Jolly bodies but are generally lighter staining and can even look pale depending on the stain used.

Mycoplasma haemofelis is a blood borne infection that causes **Feline Infectious Anemia (FIA)** in cats. The test of choice to diagnose the infection is **PCR** since the organisms are usually not visible on blood smears. It can be easily treated with antibiotics such as **doxycycline or enrofloxacin**. Occasionally, glucocorticoids and blood transfusions are required if the anemia is severe.

**Mycoplasma haemofelis** (previously called Hemobartonella felis) is associated **with FeLV** and when you see regenerative anemia (Polychromasia – Anisocytosis - Reticulocytosis) in a FeLV positive cat, suspect co-infection with Mycoplasma haemofelis.

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## Question

Which of the following is not passed by passive contact and sharing of a litter box?

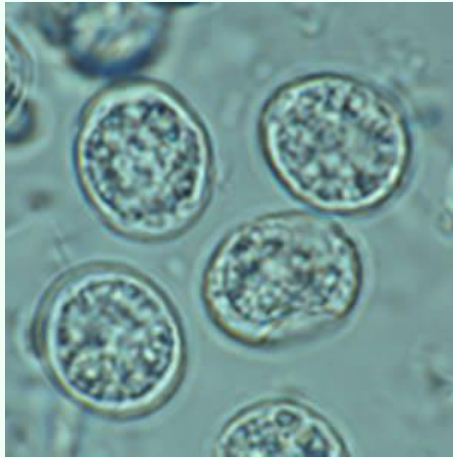
- Feline leukemia virus
- Feline panleukopenia
- Feline herpes virus
- Feline immunodeficiency virus
- Feline corona virus

**Explanation -** The correct answer is feline immunodeficiency virus. The virus is shed in the saliva and is transmitted mainly through bites. The disease mostly affects older, outdoor male cats which have a higher likelihood of getting into fights and being bitten by other cats. Having the disease makes them immunosuppressed and more susceptible to infections. The remainder of the answer choices can be passed via passive contact.

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## Question

A 2-year old male neutered indoor/outdoor Maine Coon presents for **diarrhea** for the past week. On exam he is bright, alert, and responsive. His temperature is **103.4**, heart rate is 140 beats per minute, and respiration rate is 40 breaths per minute. **Mucoid** brown to green diarrhea is found on rectal examination. The cat is still eating well and has normal activity levels. Blood work shows a monocytosis and eosinophilia. On fecal exam you see tiny oocysts (see image). You should inform the owner of which of the following?



- Clean litterbox daily and wash hands thoroughly. Immunocompromised people should avoid the litter box.
- Treatment could have potential adverse effects
- Lifelong signs may reoccur with flare ups in the future
- Treatment will be long and the cat should be isolated

**Explanation** - Toxoplasmosis is a zoonotic disease. Cats are the reservoir. Clinical signs are typically seen in younger cats but can occur in older cats or immunocompromised cats as well. Signs can vary from diarrhea to fever, malaise, orthopedic diseases, uveitis, or neurological signs. Oocysts are shed in the feces, where they take around 5 days to sporulate and become infective. Isolating the affected animal will decrease risk of transmission to other animals.

Cleaning the litterbox daily will decrease the risk of exposure of infective oocysts to humans. Toxoplasmosis can cause birth defects or still births in humans, so pregnant women should avoid the litter box. Immunocompromised people should also avoid cleaning the litter box. Treatment of choice for cats is typically **clindamycin**.

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