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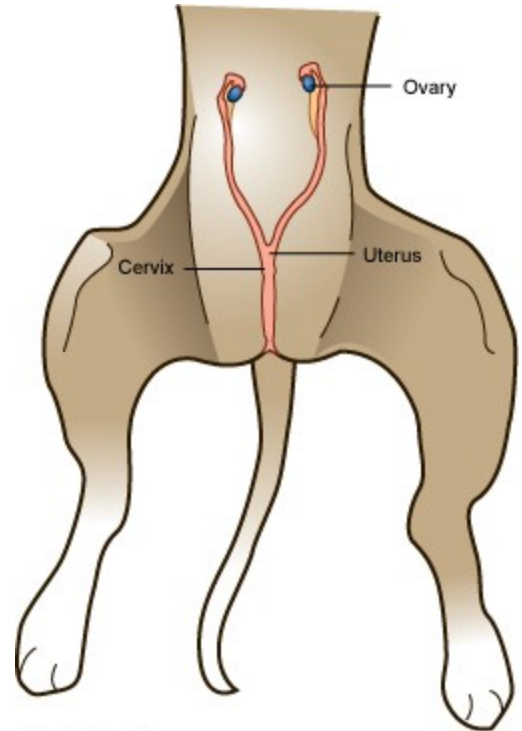
Pyometra in Dogs

What is pyometra?

Pyometra is defined as an infection in the uterus. Pyometra is considered a serious and life threatening condition that must be treated quickly and aggressively.

"Pyometra is a secondary infection..."

Pyometra is a secondary infection that occurs as a result of hormonal changes in the female's reproductive tract. During estrus ("heat"), white blood cells, which normally protect against infection, are inhibited from entering the uterus. This allows sperm to safely enter the female's reproductive tract without being damaged or destroyed by these immune system cells. Following estrus ("heat") in the dog, progesterone hormone levels remain elevated up to two months and cause thickening of the lining of the uterus in preparation for pregnancy and fetal development. If pregnancy does not occur for several consecutive estrus cycles, the uterine lining continues to increase in thickness until cysts often form within the tissues (a condition called Cystic Endometrial Hyperplasia). The thickened, cystic lining secretes fluids that create an ideal environment for bacteria to grow in. Additionally, high progesterone levels inhibit the ability of the muscles in the wall of the uterus to contract and expel accumulated fluids or bacteria. **The combination of these factors often leads to infection.**



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What else can cause changes in the uterus?

The use of progesterone-based drugs can cause changes in the uterus similar to the estrus cycle. In addition, estrogen or synthetic estrogen drugs will increase the effects of progesterone on the uterus. Drugs containing both estrogen and progesterone are sometimes used to treat certain conditions of the reproductive system. Any intact female receiving hormones must be carefully monitored for the development of pyometra.

How do bacteria get into the uterus?

The cervix is the gateway to the uterus. It remains tightly closed except during estrus, when it relaxes to allow sperm to enter the uterus.

"If the cervix is open or relaxed, bacteria that are normally found in the vagina can enter the uterus easily."

If the cervix is open or relaxed, bacteria that are normally found in the vagina can enter the uterus easily. If the uterus is normal, the uterine environment is adverse to bacterial survival; however, when the uterine wall is thickened or cystic, perfect conditions exist for bacterial growth. In addition, when these abnormal conditions exist, the muscles of the uterus cannot contract properly either due to thickening of the uterine wall or the hormone progesterone. This means that bacteria that enter the uterus cannot be expelled.

When does pyometra occur?

Pyometra may occur in any sexually intact young to middle-aged dog; however, it is most common in older dogs.

"Pyometra usually occurs two to eight weeks after the last estrus."

After many years of estrus cycles without pregnancy, the uterine wall undergoes the changes that promote this disease. Pyometra usually occurs two to eight weeks after the last estrus ("heat cycle").

What are the clinical signs of pyometra?

The clinical signs depend on whether or not the cervix remains open. If it is open, pus will drain from the uterus through the vagina to the outside. Pus or an abnormal discharge is often seen on the skin or hair under the tail or on bedding and furniture where the dog has recently laid. Fever, lethargy, anorexia, and depression may or may not be present.

If the cervix is closed, pus that forms is not able to drain to the outside. It collects in the uterus ultimately causing the abdomen to distend. The bacteria release toxins that are absorbed into the bloodstream. Dogs with closed pyometra become severely ill very rapidly. They are anorectic, very listless and very depressed. Vomiting or diarrhea may also be present.

Toxins released by the bacteria affect the kidney's ability to retain fluid. Increased urine production occurs, and many dogs drink an excess of water to compensate. Increased water consumption may occur in both open- and closed-cervix pyometra.



How is pyometra diagnosed?

Dogs that are examined early in the course of the disease may have a slight vaginal discharge and show no other signs of illness. However, most dogs with pyometra are seen later in the illness. A very ill female dog with a history of recent "heat" that is drinking an increased amount of water should be suspected of having pyometra. This is especially true if there is a vaginal discharge or a painful, enlarged abdomen.

Dogs with pyometra usually have a severe elevation of the white blood cell count and often have an elevation of globulins (a type of protein often associated with the immune system) in the blood. The specific gravity (concentration) of the urine is generally low due to the toxic effects of the bacteria on the kidneys. However, these changes are non-specific and may be present in any dog with a major bacterial infection.

If the cervix is closed, radiographs (x-rays) of the abdomen will often identify the enlarged uterus. If the cervix is open, there will often be such minimal uterine enlargement that the radiograph will be inconclusive. An ultrasound examination may be helpful in identifying an enlarged uterus and differentiating that from a normal pregnancy. Ultrasound changes that indicate pyometra include increased uterine size, thickened uterine walls, and fluid accumulation within the uterus.

How is pyometra treated?

"The preferred treatment is to surgically remove the infected uterus and ovaries..."

The preferred treatment is to surgically remove the infected uterus and ovaries, or perform an ovariohysterectomy ("spay"). Dogs diagnosed in the early stage of the disease are very good surgical candidates. The surgery is somewhat more complicated than a routine spay at this stage. However, most dogs are diagnosed with pyometra when they are quite ill resulting in a more complicated surgical procedure and a longer period of hospitalization. Intravenous fluids are required to stabilize the dog before and after surgery. Antibiotics are usually given for two weeks after surgery.

My dog is a valuable breeding female. Is there a treatment other than surgery?

There is a medical approach to treating pyometra, although the success rate is widely variable and not without considerable risk and potential long-term complications. *Prostaglandins* are a group of hormones that lower the blood level of progesterone, relax and open the cervix, and cause the uterus to contract and expel bacteria and pus. They can be used to treat this disease, but they are not always successful and have some important limitations.

1. They cause side effects including restlessness, panting, vomiting, defecation, salivation, and abdominal pain. The side effects occur within about fifteen minutes after administration and often last for a few hours. They become progressively milder with each successive treatment. The pain may be decreased by walking or exercising the dog for about 30 minutes following an injection.
2. There is no clinical improvement for about forty-eight hours, so dogs that are severely ill and need immediate life-saving treatment are poor candidates.
3. Because prostaglandins cause the uterus to contract, it is possible for the uterus to rupture and spill infection into the abdominal cavity resulting in the severely life-threatening condition known as *peritonitis*. This is most likely to happen when the cervix is closed.

There are some important statistics that you should know about this form of treatment:

1. The success rate for treating open-cervix pyometra is approximately 75-90% in uncomplicated cases.
2. The success rate for treating closed-cervix pyometra is only about 25-40%.
3. The rate of recurrence of the disease in a treated dog is generally thought to be as high as 50-75%.
4. The chance of future successful breeding is decreased to about 50-75%.

What happens if I don't treat my dog?

"The chance of successful resolution without surgery or prostaglandin treatment is extremely low."

The chance of successful resolution without surgery or prostaglandin treatment is extremely low. If treatment is not performed quickly, the toxic effects from the bacteria will be fatal in many cases. If the cervix is closed, it is possible for the uterus to rupture, spilling the infection into the abdominal cavity. This will also be fatal. Pyometra is a serious medical condition that requires prompt treatment.

*This client information sheet is based on material written by: Ernest Ward, DVM
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