Cystic Endometrial Hyperplasia/Pyometra Susan Little DVM Diplomate ABVP (Feline) Bytown Cat Hospital Ottawa, Canada a) Etiology: It has typically been believed that because cats are induced ovulators, the incidence of cystic endometrial hyperplasia (CEH)/pyometra is lower than in dogs. However, recent studies have shown a great many cats are also spontaneous ovulators, and therefore may experience prolonged diestral periods without pregnancy. Repeated pseudopregnancies may predispose the uterus to CEH, which is a disorder of proliferative and degenerative changes in the endometrium associated with aging. Most queens with pyometra were in estrus some time in the preceding 60 days. Potter et al (1991) reported that 40% (16/40) of queens with pyometra or endometritis had CLs. Lawler et al (1991) reported that 67% (20/30) queens with pyometra had luteal phase ovaries. Progesterone causes hyperplasia of the endometrium and endometrial glands. Other effects of progesterone include inhibition of local leukocyte responses to infection in the uterus and decreased myometrial contractility. Estradiol causes an increase in the number of estrogen and progesterone receptors in the endometrium. It also causes cervical dilation during estrus and therefore allows bacteria that are part of the normal flora of the vagina (especially E. coli and Streptococcus spp) to ascend into the uterus. It is normal for cats to have both aerobic and anaerobic bacteria in the vagina. Younger cats have more vaginal bacteria than older cats, and cats in heat or pregnant have more bacteria than anestrus cats. Vaginal cultures are therefore hard to interpret since the queen has normal bacterial flora. This combination of ascending bacteria and an abnormal endometrium predispose queens to pyometra. b) Clinical symptoms and diagnosis: Cats with CEH may or may not have endometritis. CEH tends to be a chronic subclinical condition and may be hard to diagnose definitively without biopsy of the uterus. A presumptive diagnosis of endometritis may be made from response to antibiotic treatment, which should last for 2-4 months. Uterine pathology, mostly secondary to CEH and endometritis, is common in queens over 5 years of age. CEH is very common in unbred queens over 3 years of age. Perez et al (1999) found that 88.2% of queens older than 5 years in a breeding colony had CEH, versus a 30% incidence in queens 2-4 years old. A group of feral queens also sampled had no CEH. They concluded that colony queens showed a predisposition to CEH that was correlated with elevated serum estradiol concentrations. CEH is one of the most important causes of infertility in catteries. Cats with advanced CEH are occasionally found with mucometra or hydrometra, characterized by variable amounts of mucus in the uterus. In hydrometra, the mucin is thin and watery. In mucometra, the mucin is thick or even semisolid. Queens with either condition do not have bacterial infections and are not systemically ill. The main symptom is abdominal distension, with or without a vaginal discharge. The clinical signs of pyometra include a vulvar discharge, depression, dehydration, anorexia, fever, weight loss and a distended abdomen. Any abnormal vulvar discharge in an intact queen should be assumed to be due to pyometra. However, 15-30% of queens have no vulvar discharge (closed cervix). Queens are often very meticulous in grooming, however, so evidence of the discharge may be hard to find. A surprising number of queens with open cervix pyometras have little or no signs of systemic illness. Very occasionally, pyometra is found during a routine annual health examination. Polyuria and polydipsia are far less frequent in queens with pyometra than bitches. Most queens with pyometra will have a leukocytosis with a left shift. The diagnosis can be affirmed by finding an enlarged uterus on radiographs or ultrasound. In some cases, the uterine enlargement is segmental, mimicking a pregnancy. Occasionally, only one horn of the uterus is involved. Cats who have CEH but not pyometra may be normal on physical examination. Their blood and urine tests are normal. Ultrasound of the abdomen is

very sensitive in detecting uterine enlargement. Radiographs are not as useful, but being able to see the uterus on a radiograph usually indicates the uterus is enlarged. The final diagnosis is often not made until exploratory surgery is performed and the uterus is removed and/or biopsied. c) Treatment: There is no specific treatment for CEH. Theoretically, a prolonged period of anestrus may allow for some normalization of the endometrium. Progestagens must be avoided. Mibolerone is effective in inducing anestrus in cats, but is associated with serious adverse effects. Maintaining queens in less than 10 hours of daylight may induce a photoperiod anestrus. Initial treatment for pyometra may involve intravenous fluids and antibiotics. Since E. coli is the most common bacterium involved, good antibiotic choices are enrofloxacin (Baytril®), trimethoprim-sulfa (Tribrissen®), or clavulanate-amoxicillin (Clavamox®). It is not usually necessary to perform a culture and sensitivity test on the uterine discharge. Antibiotic therapy alone for pyometra is not often successful. Douches using antiseptic or antibiotic solutions are also not effective. One series of 183 queens (Kenney et al, 1987) with pyometra found an 8% mortality rate, most commonly associated with a ruptured uterus and peritonitis. Two approaches to treatment of pyometra may be taken: ovariohysterectomy and prostaglandin therapy. i) Ovariohysterectomy provides the most consistent results as the source of the problem is permanently removed and cats recover quickly. For queens who are not valuable to a breeding program, this is probably the best choice. ii) Prostaglandin therapy has been the most successful treatment for open-cervix pyometra where it is desirable to preserve the future fertility of the queen. Success rates for return to fertility may be as high as 86%. Prostaglandin F2 (PGF2) has been used both for pyometra and for metritis postpartum. The best queens for this therapy are under 6 years of age, in good health, and have no retained fetal material if they are postpartum (ultrasound is very helpful in determining this). PGF2 therapy is contraindicated in queens with some medical conditions such as asthma. PGF2 therapy should not be used if the queen is in poor condition or is critically ill. Careful assessment of the patient is critical for ruling out conditions that could preclude the use of PGF2 . For example, in rare cases, pyometra is associated with uterine torsion, a contraindication for PGF2 treatment. Treatment of closed cervix pyometra should only be undertaken with caution, and only in medically stable, young and otherwise healthy queens. If the cervix does not open after a few days of therapy, or if the queen becomes ill, she should be spayed. Only natural prostaglandin is used since a dose has not yet been established for use of synthetic prostaglandins for this purpose in the cat. Queens are treated with 0.1 mg/kg of dinoprost (Lutalyse) SC, once or twice daily for 5-7 days. The main purpose of the PGF2 is to cause the uterus to contract and expel its contents. The luteolytic effects of PGF2 seen in other species have not been documented in the queen. If the feline CL does responds to PGF2 , it seems to take several days of treatment to effect luteolysis. Queens need to be watched closely during PGF2 therapy and may be hospitalized for the part of each day which follows administration of the drug. Queens must be monitored for rising fevers, abdominal pain, or other symptoms of systemic illness or rupture of the uterus (which could lead to peritonitis). Monitoring with radiographs or ultrasound may be needed in addition to blood counts. The rate of complications with this treatment is very low. Side effects are noted often, usually within minutes of the injection, and will be worse in the first 2 days. The contractile effects of PGF2 on the smooth musculature of the myometrium, GI tract, respiratory tract, and bladder account for these reactions. Common side effects include restlessness, vocalizing, panting, vomiting, diarrhea, salivation, and intense grooming of the flanks and vulva. These effects usually last only a few minutes, rarely lasting longer than 15-20 minutes. The reactions become less obvious with each treatment. Usually by

the fifth day, little or no side effects are seen. Antibiotics should be given throughout the course of PGF2 therapy and for some time afterward. Queens should be followed up by the veterinarian one and two weeks following PGF2 treatment. The vaginal discharge should change to a clear fluid by the seventh day following treatment. This clear discharge may last for up to 10 days. Most cats are back to normal 2 weeks after treatment. If a purulent or bloody discharge is persistent, a second course of therapy may be necessary. Most queens will come back into estrus within several weeks and they should be bred at the first opportunity. It may be valuable to treat the queen with antibiotics during this estrus and into the first 4 weeks of any resulting pregnancy. An antibiotic safe for use in pregnancy, such as amoxicillin/clavulanic acid (Clavamox®), should be chosen. Occasionally, a queen has a second episode of pyometra after a pregnancy, but repeating the PGF2 treatment may still enable her to have a litter in the future. After treatment with PGF2 , pregnancy rates of 71-86% have been reported. Davidson et al (1992) reported recurrence of pyometra within 1 year in 14% of treated cats. Some cats (4%) will have subclinical generalized peritonitis associated with pyometra which may contribute to ongoing problems with ill health and eventually necessitate ovariohysterectomy. There are no reports of successful treatment of closed pyometra in the cat although in the dog the success rate is reported to be 34%. References: Davidson AP, Feldman EC, Nelson RW. Treatment of pyometra in cats, using prostaglandin F2alpha: 21 cases (1982-1990). J Amer Vet Med Assoc 200(6): 825-828, 1992 Gudermuth DF, Newton L, et al. Incidence of spontaneous ovulation in young, group-housed cats based on serum and faecal concentrations of progesterone. J Repro Fert Suppl 51:177-184, 1997 Kenney KJ, Matthiesen DT, et al. Pyometra in cats: 183 cases (1979-1984). J Amer Vet Med Assoc 191(9): 1130-1132, 1987 Lawler DF, Evans RH, et al. Histopathologic features, environmental factors, and serum estrogen, progesterone, and prolactin values associated with ovarian phase and inflammatory uterine disease in cats. Am J Vet Res 52(10): 1747-1753, 1991 Lawler DF, Johnston SD, et al. Ovulation without cervical stimulation in domestic cats. J. Reprod. Fertil Suppl. 47:57-61, 1993 Perez JF, Conley AJ, Dieter JA, et al. Studies on the origin of ovarian interstitial tissue and the incidence of endometrial hyperplasia in domestic and feral cats. Gen comp Endocrinol 116(1): 10-20, 1999 Potter K, Hancock DH, Gallina AM. Clinical and pathologic features of endometrial hyperplasia, pyometra, and endometritis in cats: 79 cases (1980-1985). J Amer Vet Med Assoc 198(8): 1427-1431, 1991 Bonagura JD (editor). Kirk's Current Veterinary Therapy XII: Small Animal Practice. W.B. Saunders Co., Philadelphia, 1995. Davidson AP. Medical treatment of pyometra with prostaglandin F2 in the dog and cat, pp. 1081-1083. Lawler DF, Johnston SD. Complications of noncopulatory ovulation in queens, pp. 1083-1085. Feldman EC, Nelson RW. Canine and Feline Endocrinology and Reproduction. Second Edition. W.B. Saunders Co., Philadelphia, 1996, pp. 759-762. ISBN 0-7216-3634-9 Sherding RG (editor). The Cat: Diseases and Clinical Management, second edition. W.B. Saunders Co., Philadelphia, 1994. ISBN 0-7216-5936-5 Johnson CA. Female reproduction and disorders of the female reproductive tract, pp. 1855-1876 Simpson GM, England GCW and Harvey M. (editors). BSAVA Manual of Small Animal Reproduction and Neonatology. British Small Animal Veterinary Association, Cheltenham UK, 1998. ISBN 0-905214-36-6 • Verstegen JP. Pharmacological control of reproduction in the cat, pp. 219-226