

# Female Infertility

## Basics

### OVERVIEW

- Abnormal cycling, breeding failure, copulation failure, conception failure, or pregnancy loss
- The female dog is a “bitch”; the female cat is a “queen”; fertile period (estrus) commonly termed “heat”

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Dogs
- Cats

#### Breed Predilections

- Dog breeds susceptible to low levels of thyroid hormone (known as “hypothyroidism”) may have a higher number of cases of female infertility than other breeds; breeds susceptible to hypothyroidism include the golden retriever, Doberman pinscher, dachshund, Irish setter, miniature schnauzer, Great Dane, poodle, and boxer

#### Mean Age and Range

- Pets of all ages; may be more common in old pets
- Dogs greater than 6 years of age—more likely to have underlying cystic endometrial hyperplasia, a condition in which the lining of the uterus thickens abnormally and contains fluid-filled sacs or cysts; may be susceptible to uterine infection and failure of conception or implantation

#### Predominant Sex

- Female

### SIGNS/OBSERVED CHANGES IN THE PET

- Failure to cycle
- Too frequent cycling (< 4 months between heats in dogs); persistent heat
- Failure to breed with a male
- Normal act of breeding, with no subsequent pregnancy or delivery or birth (known as “parturition”); negative pregnancy examination after mating
- Known pregnancy (through physical examination, ultrasound examination) with no subsequent delivery or birth (parturition)

### CAUSES

- Previous surgical removal of ovaries and uterus (known as an “ovariohysterectomy” or “spay”)— pets already mature when obtained and possibility of previous ovariohysterectomy

#### Dogs

- Insemination at the improper time in “heat” or “estrus”—most common
- Subclinical uterine infection



- Cystic endometrial hyperplasia, a condition in which the lining of the uterus thickens abnormally and contains fluid-filled sacs or cysts
- Male infertility factors
- Inadequate levels of thyroid hormone (hypothyroidism)
- Excessive levels of steroids produced by the adrenal glands (known as “hyperadrenocorticism” or “Cushing's syndrome”)
- Anatomic abnormality
- Chromosomal abnormality
- Abnormal ovarian function
- Infection with *Brucella canis*—always a possibility
- Silent heats

### Cats

- Similar causes to those of dogs
- Lack of sufficient stimulus during breeding to induce release of eggs (ovulation)
- Systemic viral or protozoal infection

## RISK FACTORS

- *Brucella canis*—dogs
- Inadequate levels of thyroid hormone (hypothyroidism)
- Excessive levels of steroids either produced by the adrenal glands (hyperadrenocorticism or Cushing's syndrome) or the result of administration in medications (known as “iatrogenic hyperadrenocorticism” or “iatrogenic Cushing's syndrome”)—dogs and cats
- Generalized (systemic) viral infection—canine herpesvirus; feline leukemia virus (FeLV); feline immunodeficiency virus (FIV)
- Generalized (systemic) protozoal infection, such as toxoplasmosis—dogs and cats
- Any long-term (chronic), debilitating disease condition—dogs and cats
- Congenital (present at birth) abnormalities of the vagina—dogs and cats; the “vagina” is the tubular passageway leading from the opening of the vulva (female external genitalia) to the cervix of the uterus
- Old age

## Treatment

### HEALTH CARE

- Medication to decrease heat or estrus (known as “estrus suppression”) for one to two heat or estrous cycles may benefit bitches with frequent cycling (< 4 months between heats)
- Cats—seasonal breeders; depend on photoperiod (that is, length of daylight); queens cycle when exposed to long day length, normally from late January to mid-October; induce year-round cycling by daily light exposure of 12 hours or more; for a non-cycling cat during the breeding season, evaluate the queen's housing and exposure to light

### SURGERY

- Surgery for vaginal abnormalities (dogs)—may improve breeding and vaginal delivery of puppies
- Surgical repair of a closed tubular genital tract (dogs and cats)—difficult procedure; prognosis for future fertility guarded
- Surgical drainage of ovarian cysts (dogs and cats)—effectiveness unknown
- One-sided removal of a cancerous ovary (dogs and cats)—future fertility depends on resumption of normal function of the remaining ovary and lack of spread of the cancer (known as “metastasis”)

## Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Antibiotics (dogs and cats)—for uterine infection; choice depends on bacterial culture and sensitivity test of the

uterus or of vaginal discharge during heat or estrus

- L-thyroxine (thyroid hormone)—for inadequate levels of thyroid hormone (hypothyroidism)

## **HORMONES TO STIMULATE THE OVARIES (KNOWN AS “GONADOTROPIN THERAPY”)**

- For induction of release of eggs from the ovary (ovulation)
- Gonadotropin-releasing hormone, which causes release of luteinizing hormone from the pituitary gland—”luteinizing hormone” is the hormone that causes growth and maturation of eggs in the ovary; or human chorionic gonadotropin, which has luteinizing-like activity
- Cats not adequately stimulated to ovulate at the time of breeding—gonadotropin-releasing hormone at time of breeding
- Ovarian cystic disease—dogs and cats: gonadotropin-releasing hormone or human chorionic gonadotropin; causes release of eggs (ovulation) or luteinization of cystic ovarian tissue
- Heat or estrous induction (dogs)—diethylstilbestrol until signs of early heat or estrus are induced; cabergoline; deslorelin implant
- Medications to suppress heat or estrus (dogs)—megestrol acetate or mibolerone

## **Follow-Up Care**

### **PATIENT MONITORING**

- L-thyroxine (thyroid hormone) treatment in dogs—blood concentrations of thyroid hormones (known as “T<sub>3</sub>” and “T<sub>4</sub>”) will be rechecked after one month of supplementation to ensure adequate absorption of medication and resumption normal thyroid levels
- Ultrasound examination in dogs and cats—to definitively diagnose pregnancy; monitor gestation
- Progesterone assay in dogs and cats; “progesterone” is a female hormone, which supports and maintains the pregnancy

### **PREVENTIONS AND AVOIDANCE**

- Inherited cause of female infertility (such as inadequate levels of thyroid hormone [hypothyroidism])—consider advisability of retaining the dog or cat in the breeding program
- Control underlying conditions such as hypothyroidism or Cushing’s before reproductive adverse effects develop

### **POSSIBLE COMPLICATIONS**

- Depend on underlying cause
- Bitches with a vaginal anatomic abnormality—persistent or recurrent urinary tract disease or inflammation of the vagina (known as “vaginitis”; the “vagina” is the tubular passageway leading from the opening of the vulva [external genitalia] to the cervix of the uterus)

### **EXPECTED COURSE AND PROGNOSIS**

- Prognosis for future fertility—initially good, because the most common cause of female infertility is improper breeding management; prognosis worsens with other causes
- Pets with inadequate levels of thyroid hormone (hypothyroidism) treated with thyroid hormone—prognosis for future fertility guarded with return to normal thyroid hormone levels

## **Key Points**

- Abnormal cycling, breeding failure, copulation failure, conception failure, or pregnancy loss
- Most common cause of female infertility is improper breeding management
- Inherited cause of female infertility (such as inadequate levels of thyroid hormone [hypothyroidism])—consider advisability of retaining the dog or cat in the breeding program