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Bruce W. Christensen

Been There, Done That: A Practical Primer for Veterinarians Considering Inclusion of Small Animal Theriogenology Services in Their Practice 497
Jane Barber, Katherine Settle, and Will Schultz

Broadening your scope of practice to include theriogenology services offers a myriad of advantages. Theriogenology services are profitable, offer new revenue streams, and optimize the use of support staff and hospital. Offering reproductive services sets your practice apart from competitor practices. Breeder clients are demanding but loyal and return for repeat services; they also request and follow recommendations for “high-end” services. Your theriogenology clients often refer locally placed puppies and kittens to you for primary care, and you gain new general practice clients. And it is fun!

Assisted Reproduction in the Male Cat 511
Aime K. Johnson

The demand for feline semen collection, evaluation, and subsequent use is growing as a way to preserve important genetic materials. This article describes semen collection methods using a variety of techniques that can be applicable in almost any setting. Also discussed are cryopreservation methods that optimize sperm survival.

Assisted Reproduction in the Female Cat 523
Aime K. Johnson

Assisted reproduction in the queen can range from simple ovulation induction to more advanced techniques such as in vitro fertilization. This article describes techniques available and the success associated with each.

Evaluation of Canine Sperm and Management of Semen Disorders 533
Kara A. Kolster

Semen evaluation of the male dog is a critical step in any canine infertility workup. Assessment of total sperm count, sperm viability, and sperm morphology are the mainstay of breeding soundness evaluation. Adjunct tests, such as ultrasonography and serum hormone levels, can aid in diagnosis. Pharmacologic treatments, dietary supplements, and management practices may help improve breeding success in subfertile dogs. This article discusses a clinically practical approach to assessing sperm abnormalities and fertility in male dogs.
Breeding Soundness Examination of the Bitch 547
Carla Barstow, Robyn R. Wilborn, and Aime K. Johnson

A breeding soundness examination is a vital part of any breeding program. These examinations are not performed as frequently in the bitch as they are in the male dog. They allow clinicians to identify any problems at an early stage in a bitch’s breeding career and to screen for any genetic abnormalities. A thorough physical examination and accurate history guide the choice of which diagnostics tests are most useful. Ultrasound scan, culture, cytology, and biopsies (surgical and nonsurgical techniques) are discussed. Knowing which stage of the cycle to perform these diagnostics yields the most information and increases the chance of a successful outcome.

Current Review of Artificial Insemination in Dogs 567
Stuart J. Mason

Artificial insemination is the collection of semen from the male and the subsequent insertion of the collected semen into the female. Artificial insemination may be requested for several reasons, including inability to achieve a mating or owing to the use of fresh chilled or frozen semen. A good understanding of the cycle of the bitch is imperative for maximizing pregnancy rates, as poor timing of insemination is the most common cause of subfertility in the bitch. Insemination techniques commonly undertaken in the bitch include vaginal insemination, surgical intrauterine insemination, and transcervical insemination.

Estrous Cycle Manipulation in Dogs 581
Michelle Anne Kutzler

Since 1939, scientists have studied estrous cycle manipulation in dogs resulting in more articles published in this field than any other area of canine reproduction. Estrous cycle manipulation in dogs must be safe and reliable. Dopamine agonists, gonadotropin-releasing hormone agonists, and gonadotropins are hormones that have been used for estrus induction in bitches, but each treatment has advantages and disadvantages. Despite widespread availability of these medications throughout the rest of the world, there are no drugs currently labeled for canine estrus induction in the United States.

Estrus Suppression in Dogs 595
Michelle Anne Kutzler

Since 1952, scientists have studied estrus suppression in dogs. Estrus suppression in dogs must be safe and reliable. Medications used for estrus suppression in bitches include gonadotropin-releasing hormone (GnRH) agonists, GnRH antagonists, progestogens, and androgens. Despite widespread availability of these medications throughout the rest of the world, there are no drugs currently labeled for canine estrus induction in the United States.
Mismating Diagnosis and Protocols  
Natalie S. Fraser

Mismating, or termination of pregnancy, is a commonly requested reproductive procedure for bitches and queens. Surgical treatment via ovariohysterectomy is the preferred choice when bitches or queens are not desired for future breeding purposes. Animals that are reproductively valuable can be treated with a variety of drugs to terminate the pregnancy. The choice of specific medical therapy is based on safety, efficacy, availability of the drug, and gestational age of the pregnancy. Currently, there is no US Food and Drug Administration–approved treatment of mismating in North America for dogs or cats.

Gestational Aging and Determination of Parturition Date in the Bitch and Queen Using Ultrasonography and Radiography  
Cheryl Lopate

This article provides a complete understanding of how radiography and ultrasound imaging can be used to determine gestational age when inadequate breeding data are available. Formulas for calculation of gestational age using both fetal and extrafetal structures are presented. Ultrasonographic descriptions of organ development and their use in determining gestational age are discussed. This information may be used to monitor the health and development of the fetuses and may be useful when the need to plan an elective or emergency Cesarean section occurs. Ultrasound imaging to assess fetal stress, viability, placental health and to sex fetuses is also described.

Pyometra in Small Animals  
Ragnvi Hagman

Pyometra is a common disease in dogs and cats. Hormones and opportunistic bacteria are fundamental in the development, with progesterone playing a key role. The disease should be suspected in intact bitches and queens presenting with illness, and particularly if within 4 months after estrus. Early diagnosis and treatment are vital to increase chances of survival as endotoxemia and sepsis often are induced. Typical clinical signs include vaginal discharge, depression, anorexia, polyuria and polydipsia, fever and gastrointestinal disturbances. Surgical ovariohysterectomy is the safest and most effective treatment. For breeding animals with less severe illness, purely medical treatments alternatives are possible.

Periparturient Diseases in the Dam  
Kristine Gonzales

This article provides an overview of some of the most common diseases affecting the dam in the periparturient period, including disorders of lactation, inappropriate maternal behavior, mastitis, metritis, and eclampsia. The dam experiences hormonal, physiologic, and physical changes during pregnancy, parturition, and lactation. Obtaining a detailed history and
performing a thorough physical examination are essential for accurately diagnosing and treating the dam during this unique time. A particular challenge exists when identifying problems in the periparturient period, because all medications and aspects of management affect the health of both the dam and her offspring.

**Small Animal Neonatal Health**

Robyn R. Wilborn

Although most veterinarians have been caring for neonates successfully for several years, it is often good to review our methods and aim to incorporate new practices that will increase survivability, especially of the weaker neonates. These tips are easy to incorporate and do not require radical change by the doctors or staff. Armed with some key pearls of neonatal knowledge and basic clinical skills, one can successfully prevent and treat the most common clinical presentations of neonatal puppies and kittens.

**Canine Prostate Disease**

Bruce W. Christensen

Video content accompanies this article at [http://www.vetsmall.theclinics.com/](http://www.vetsmall.theclinics.com/).

All intact, male dogs experience benign prostatic hyperplasia and hyper trophy, usually by around 6 years old. Although these dogs are predisposed to prostatic infections, only a small subset actually develop infections or show clinical signs of discomfort or subfertility. Neutered male dogs have a higher incidence of neoplasia associated with the prostate. Updated diagnostic tests, including canine prostate-specific arginine esterase, are discussed. Castration is compared with medical treatment options. Updated treatment recommendations include reducing antibiotic exposure to 4 weeks for bacterial infections and use of nonsteroidal anti-inflammatory drugs for neoplastic disease.

**Population Control in Small Animals**

Margaret V. Root Kustritz

Optimal age for ovariohysterectomy or castration has not been defined in the scientific literature. Bitches and queens are significantly less likely to develop mammary neoplasia, which has a high incidence and potentially high morbidity and mortality, if spayed when young. Tom cats exhibit undesirable behaviors that preclude them being good pets and should be castrated young. There is no compelling reason to castrate male dogs when young unless it is needed to control reproductive behaviors or prevent indiscriminate breeding. Alternatives to surgical sterilization that may be available in the future include intratesticular injection and immunization against gonadotropin-releasing hormone.

**Contraception in Dogs and Cats**

Cheryl S. Asa

Although surgical sterilization is the most common approach to reproductive management of dogs and cats in North America and many other
places, there is growing interest in nonsurgical and reversible methods. This article summarizes the methods currently available for use as reversible contraception in dogs and cats, along with cautions about reported side effects. The products covered include synthetic steroid hormones, peptide hormone agonists, vaccines, and a barrier method.