Contraception in Dogs and Cats

Cheryl S. Asa, BS, MA, PhD*

KEYWORDS

• Contraception • Fertility control • Canine • Feline

KEY POINTS

- Contraception in dogs and cats allows temporary, nonsurgical management of reproduction.
- Steroid hormone–based methods can have serious side effects, but use of the minimum effective dose can avoid these problems.
- Gonadotropin-releasing hormone (GnRH) agonists offer the most promise for dog and cat contraception, but the implant product used in Europe and Australia is not approved in the United States.
- GnRH or other vaccines might also be appropriate, but they have not been adequately tested in dogs and cats.
- Considerably more research is necessary to identify better contraceptive options for these species.

Permanent sterilization of young dogs and cats is much more common in North America than reversible contraception for managing reproduction. There is increasing interest, however, in reversible contraception, particularly when temporary or nonsurgical approaches to fertility control are preferred. Unfortunately, the choices are limited. Due to the high cost of bringing pharmaceutical products to market, the simplest option is frequently extralabel use in dogs and cats of drugs tested and approved for human application. The most commonly used human contraceptives are methods based on steroid hormones, for example, the combination birth control pill containing synthetic estrogen and progestin, long-acting implants, or injections containing only a progestin. Some of these products have been tested in dogs and cats, with results varying by product and dose. The most important outcome of those trials has been the recognition of profound species differences, especially in the

The author has nothing to disclose.
AZA Reproductive Management Center, Saint Louis Zoo, 1 Government Drive, St Louis, MO 63110, USA
* 244 Mitchell Brook Road, Norwich, VT 05055.
E-mail address: asa@stlzoo.org

Vet Clin Small Anim ■ (2018) ■–■
https://doi.org/10.1016/j.cvsm.2018.02.014 **vetsmall.theclinics.com**

occurrence of side effects, many of which can be life threatening. This review summarizes those outcomes as well as the other contraceptive options available for potential use in dogs and cats.

CONTRACEPTIVE METHODS USING STEROID HORMONES

Estrogen

Synthetic estrogens are especially effective at preventing the luteinizing hormone (LH) surge associated with ovulation, which makes them a good candidate for contraception. They also have been associated, however, with serious side effects, although those vary by species.

Estrogen contraception in dogs

Synthetic estrogens, especially diethylstilbestrol, were formerly used for mismating in dogs. They are no longer recommended, however, due to concerns about both efficacy and safety.[1,2] In particular, estrogen can cause potentially fatal suppression of bone marrow and aplastic anemia in dogs.[3] A more recent study[4] showed, however, that a single treatment with estradiol benzoate could be both effective and safe for early pregnancy termination in dogs.

Estrogen contraception in cats

There is no similar history of estrogen treatment of fertility control in cats, but concerns for safety seem to have precluded their use, despite the lower sensitivity of cats compared with dogs to estrogen-induced aplastic anemia.[3]

Progestins

Synthetic progestins, in particular, megestrol acetate (MA), medroxyprogesterone acetate (MPA), and proligestone (PROL), have been used for decades to control fertility in cats and dogs. Progestins have a negative feedback effect on the hypothalamus and pituitary, such that continuous high concentrations suppress production of follicle-stimulating hormone (FSH) and LH, which in turn prevents stimulation of follicle growth and ovulation. Sufficient estrogen production, however, may continue to stimulate some follicle growth and estradiol production,[5] so that estrous behavior may still occur. Other contraceptive effects include impeding the movement of sperm and eggs to the site of fertilization and interfering with implantation.[6,7]

Synthetic formulations differ in how strongly they bind to receptors for other steroid hormones, such as androgens and glucocorticoids,[8–10] which determines potential side effects.[11,12] For example, binding to androgen receptors can cause masculinization,[13] and binding to glucocorticoid receptors can disrupt glucose activity and suppress immune function.[14]

Increased appetite and weight gain are common with progestin treatment,[15] with hair loss and discoloration also reported.[16] More serious side effects, evident especially at higher doses in carnivores, such as dogs and cats, include uterine and mammary gland proliferation and tumor development, growth hormone (GH) stimulation, suppression of the immune system, and altered glucose metabolism, which can be associated with diabetes mellitus.

Progestin-based contraceptives are marketed in various forms, such as pills, slow-release depot injections, and implants. Not all products are available in all countries, however, and they may be marketed under different brand names in different regions of the world. Actions of the 3 progestins most commonly used in dogs and cats, including side effects, are summarized.