

**CONSERVATIVE MANAGEMENT OF CANINE PYOMETRA. PART I:
PATHOGENESIS, PATIENT SELECTION AND PHARMACOLOGICAL BASIS**

Skliarov Pavlo Mykolayovych

Doctor of Veterinary Sciences, Professor
Dnipro State Agrarian and Economic University, Dnipro, Ukraine
ORCID: 0000-0002-4379-9583
skliarov.p.m@dsau.dp.ua

Vakulyk Viacheslav Volodymyrovych

Candidate of Historical Sciences, Associate Professor
Dnipro State Agrarian and Economic University, Dnipro, Ukraine
ORCID: 0000-0001-8773-2287
vakulik.v.v@dsau.dp.ua

Bilyi Dmytro Dmytrovych

Doctor of Veterinary Sciences, Professor
Dnipro State Agrarian and Economic University, Dnipro, Ukraine
ORCID: 0000-0003-3896-0384
bilyi.d.d@dsau.dp.ua

Mylostyvyi Roman Vasyliovych

Candidate of Veterinary Sciences, Associate Professor
Dnipro State Agrarian and Economic University, Dnipro, Ukraine
ORCID: 0000-0002-4450-8813
mylostyvyi.r.v@dsau.dp.ua

Chekan Oleksandr Mykolaiovych

Doctor of Veterinary Sciences, Professor
Sumy National Agrarian University, Sumy, Ukraine
ORCID: 0000-0002-5676-1947
achekanne@gmail.com

Canine pyometra is a severe reproductive tract disease associated with prolonged progesterone exposure during diestrus, endometrial alterations, impaired local immune defence, and bacterial colonisation of the uterus. This review synthesised current evidence on the pathogenesis of canine pyometra, patient selection for conservative management, and the pharmacological basis of treatment.

A systematic literature review was conducted using PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar. Search terms addressed canine pyometra, conservative treatment, aglepristone, prostaglandins, antiprogestins, and reproductive outcomes. Clinical and experimental studies, systematic reviews, and clinical recommendations were included. Owing to substantial clinical and methodological heterogeneity among the available studies, quantitative meta-analysis was not undertaken.

The available evidence indicates that prolonged progesterone exposure promotes secretory and cystic endometrial changes, suppresses myometrial contractility and local immune responses, and favours cervical closure, thereby creating conditions conducive to bacterial colonisation. Although Escherichia coli remains the predominant bacterial pathogen, the microbiological spectrum is considerably broader and may include mixed bacterial communities. The success of conservative management depends on timely diagnosis, careful clinical assessment, and appropriate patient selection. Suitable candidates are clinically stable breeding bitches without severe systemic complications, whereas conservative treatment is inappropriate in animals with sepsis, peritonitis, uterine rupture, or severe renal or hepatic dysfunction. Aglepristone represents the cornerstone of pharmacological management. By blocking progesterone receptors, it disrupts progesterone-dependent uterine mechanisms, promotes cervical opening, and facilitates evacuation of pathological uterine contents. Mifepristone provides an alternative oral antiprogesterin, whereas prostaglandins promote luteolysis and myometrial contractility. Their use, however, requires careful consideration of cervical patency and the animal's clinical status because inadequate uterine drainage may increase the risk of adverse effects and complications.

Conservative management of canine pyometra therefore requires careful and differentiated patient selection rather than a uniform therapeutic approach. Antiprogestins, particularly aglepristone, have a central role in fertility-preserving

pharmacological management, whereas the use of prostaglandins should be guided by the clinical condition of the animal and the potential for effective uterine drainage.

Key words: canine pyometra, conservative treatment, aglepristone, antiprogestins, prostaglandins, patient selection, reproductive function.

DOI <https://doi.org/10.32782/bsnau.vet.2026.2.11>

Introduction. Pyometra is one of the most common, severe and potentially life-threatening reproductive disorders in bitches. It may affect up to one-quarter of intact females during their lifetime and represents one of the relatively few diseases of the female reproductive tract that can pose an immediate threat to survival (Antonov, 2015; Silva et al., 2020; Skliarov and Piatybrat, 2021; McCobb et al., 2022; Bhavya Charitha et al., 2025; Ylhäinen et al., 2025).

The disease develops predominantly during the luteal phase of the oestrous cycle (diestrus), when prolonged exposure to progesterone promotes glandular and cystic endometrial changes, suppresses local immune defence and creates favourable conditions for bacterial colonisation of the uterus, particularly by *Escherichia coli* (Tsumagari et al., 2005; Agostinho et al., 2014; Ryzhykh et al., 2019; Pannu et al., 2022; Sarkar et al., 2022). *Escherichia coli* remains the most frequently isolated bacterial species in canine pyometra (Hagman and Greko, 2005; Harada et al., 2012; Inoue et al., 2013; Chang et al., 2015; Vignesh et al., 2022). However, accumulating evidence indicates that the microbiological landscape of the disease is considerably more diverse, with other bacterial species and, in some cases, mixed microbial communities also being identified (Kutzler, 2019). Ylhäinen et al. (2025) reported a substantially broader spectrum of bacterial isolates than the traditionally dominant *E. coli*, identifying 32 bacterial species as well as mixed microbial associations. Of additional clinical concern is the occurrence of multidrug-resistant isolates, which has direct implications for the selection of antimicrobial therapy (Kostyshyn et al., 2022; Lansubsakul et al., 2022; Ylhäinen et al., 2025; Camozzi et al., 2026).

Recent studies have further highlighted the contribution of local immune dysregulation and bacterial pathogenicity to the development and progression of pyometra. The severity of histopathological endometrial lesions may be associated with the characteristics of the bacterial infection, whereas dysregulated immune responses can contribute to the persistence of uterine inflammation (Lansubsakul et al., 2022; Xavier et al., 2024; Li et al., 2025).

Conservative, or pharmacological, treatment of canine pyometra has remained a matter of clinical interest for many years (Xavier et al., 2023; Hegde et al., 2025; Lopes et al., 2025). Earlier pharmacological approaches often produced only transient clinical improvement, in some cases lasting no longer than until the subsequent oestrus. Consequently, conservative treatment was regarded by many investigators as insufficiently effective (Kharenko et al.,

2003; Ponomarova and Derkach, 2012; Krekeler and Hollinshead, 2023). Traditional protocols generally relied on monotherapy or systemic antimicrobial treatment combined with oxytocin or prostaglandin F2 α (PGF2 α), with reported treatment success frequently not exceeding 60% (Lika et al., 2011; Fieni et al., 2014; Ovcharuk and Kravchuk, 2016; Melandri et al., 2019; Sethi et al., 2020; Patil et al., 2021; Zhbyr and Skliarov, 2022; Lavin and Maki, 2023).

More recent clinical studies, however, indicate that effective preservation of reproductive function can be achieved with aglepristone-based treatment. In particular, shortened administration protocols have been associated with fewer adverse effects while maintaining clinical efficacy and subsequent reproductive performance (Xavier et al., 2023; Hegde et al., 2025; Lopes et al., 2025).

For many years, ovariohysterectomy (OHE) was regarded as the only definitive and essentially non-alternative treatment for bitches with pyometra (Rootwelt-Andersen and Farstad, 2006; Ros et al., 2014; Porowska et al., 2018; McCobb et al., 2022). Surgical removal of the uterus and ovaries provides complete elimination of the primary focus of suppurative inflammation, but it is also associated with several important consequences. Removal of the ovaries permanently alters ovarian endocrine function and has been associated with behavioural changes, lethargy, increased susceptibility to obesity and urinary incontinence (Reichler, 2009; Waters et al., 2017). Surgery also carries anaesthetic and postoperative risks, particularly in older or systemically compromised animals, and may be accompanied by complications involving the vaginal stump and urinary tract (Minami et al., 1997; Okkens et al., 1997; Adamovich-Rippe et al., 2013; Waters et al., 2017). Most importantly in breeding animals, OHE results in irreversible loss of reproductive capacity (Feldman, 2000; Fieni et al., 2014; Yoon et al., 2017; Hagman, 2018).

Given the increasing breeding and economic value of selected animals, the development and refinement of fertility-preserving pharmacological protocols has therefore acquired considerable scientific and practical relevance (Fieni et al., 2014; Rosa Filho et al., 2020; Sethi et al., 2020; Panasova and Vilialova, 2021; McCallin et al., 2022, 2023).

Ucmak and Tek (2008) compared the efficacy of OHE with medical treatment using aglepristone either alone or in combination with PGF2 α . Aglepristone was administered subcutaneously at 10 mg/kg on days 1, 2 and 7, with an additional dose on day 14 when required, whereas dinoprost tromethamine was administered at 0.25 mg/kg once every 24 h from days 3 to 7.

Clinical recovery was achieved in 80 % of surgically treated animals and in 50 % of bitches receiving either aglepristone alone or aglepristone combined with PGF2 α . The authors concluded that treatment with aglepristone, alone or in combination with PGF2 α , may represent a safe alternative to OHE in bitches in diestrus with plasma progesterone concentrations above 2 ng/ml and without ovarian cysts.

Da Rosa Filho et al. (2021) compared OHE, aglepristone administered on days 1, 2 and 8, and combined treatment with aglepristone and cloprostenol administered over 7 days, with particular emphasis on vascular and stereological changes. Combined treatment with aglepristone and prostaglandin produced a more pronounced reduction in uterine vascularisation, altered uterine blood flow and was associated with more marked morphological changes than aglepristone alone.

Gabor et al. (1999) evaluated intravaginal PGF2 α for the treatment of canine pyometra. Seventeen bitches received PGF2 α by intravaginal infusion once or twice daily, together with amoxicillin and/or gentamicin. Successful treatment was achieved in 15 animals within 3–12 days, whereas two bitches underwent

OHE because of clinical deterioration. No adverse effects attributable to PGF2 α treatment were reported, and recurrence was not observed during subsequent oestrous cycles over the 12-month follow-up period. Overall treatment efficacy was 86.6 %.

The general clinical decision-making algorithm for selecting between surgical removal of the reproductive tract and fertility-preserving conservative treatment is presented in Fig. 1.

Scepticism regarding conservative treatment has largely centred on the need to evacuate pathological contents from the uterine lumen. The use of high doses of myotropic agents in the absence of cervical opening may increase the risk of uterine rupture and subsequent peritonitis (Fransson and Ragle, 2003; Fieni et al., 2014; Jitpean et al., 2014, 2016; Lee et al., 2020). Moreover, conventional medical protocols may require prolonged treatment, repeated clinical visits and regular laboratory and ultrasonographic monitoring, while still carrying a risk of disease recurrence (Contri et al., 2015; Hagman, 2018; Rocha et al., 2021).

Earlier medical treatment protocols were characterised by relatively low success rates, with

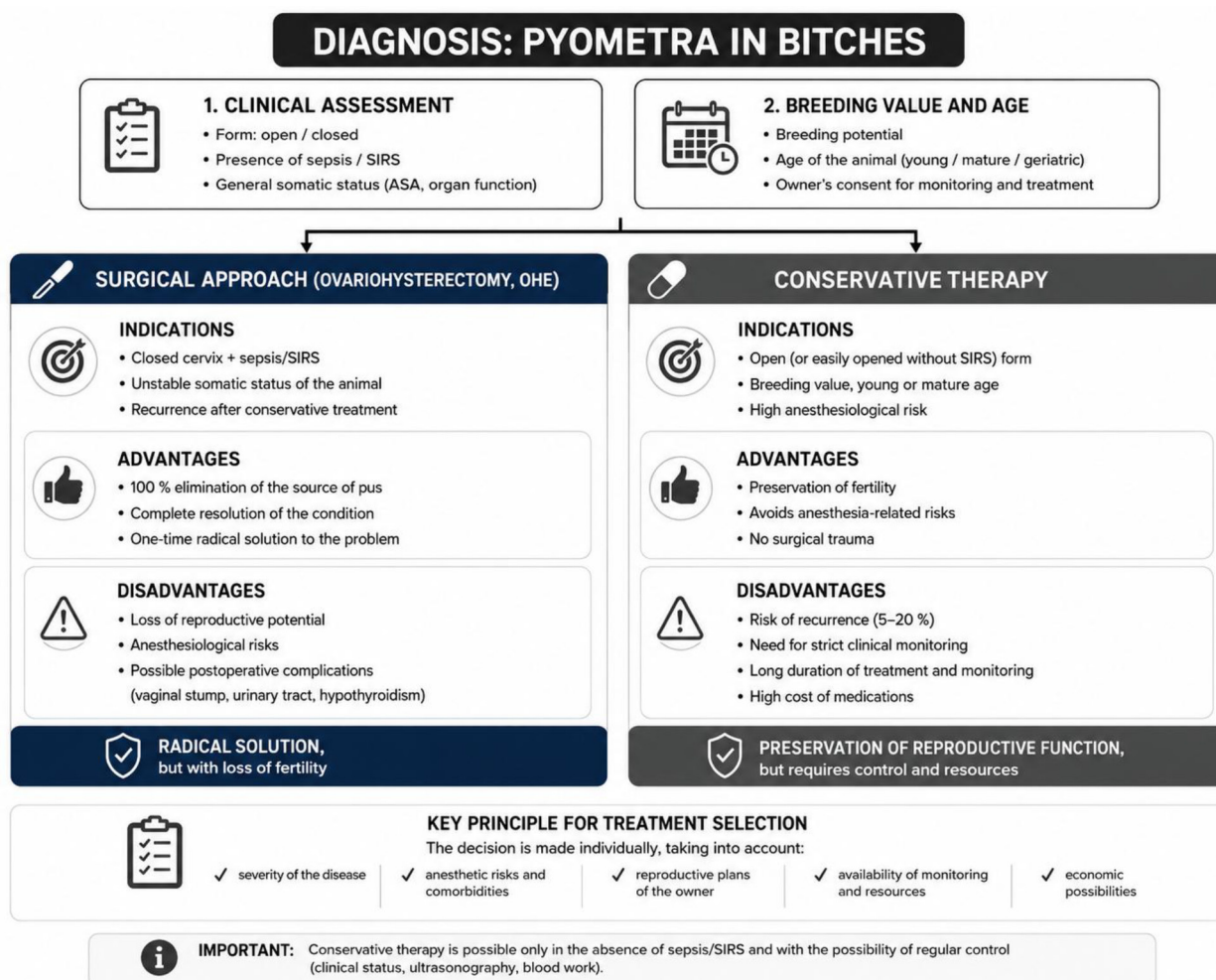


Figure 1. Clinical decision-making algorithm for selecting between surgical intervention and medical treatment

restoration of fertility achieved in only a proportion of treated bitches (Ros et al., 2014). The introduction of progesterone receptor antagonists, particularly aglepristone, in combination with dopamine agonists and prostaglandins has broadened the therapeutic options for conservative management and improved the prospects for subsequent reproductive performance (Hagman, 2012, 2017; Kumar and Saxena, 2018; Porowska et al., 2018; Singh et al., 2019; Lee et al., 2020; Krekeler and Hollinshead, 2023).

Nevertheless, no universally accepted, standardised and entirely risk-free protocol for the conservative treatment of canine pyometra has yet been established (Hagman, 2012, 2017, 2023; Krekeler and Hollinshead, 2023). The need to minimise antimicrobial resistance and treatment-related adverse effects while preserving reproductive function continues to drive the development of more differentiated and individualised pharmacological protocols (Rocha et al., 2021, 2022; Bertero et al., 2024; Hegde et al., 2025; Lopes et al., 2025).

Systematic review methodology:

Study design. This study was conducted as a systematic literature review in accordance with contemporary principles of evidence-based veterinary medicine (EBVM). The review aimed to synthesise and critically evaluate the current evidence on conservative treatment of canine pyometra, with particular emphasis on clinical efficacy and safety, indications for treatment, risk of recurrence, subsequent reproductive function, and the place of conservative management within current therapeutic approaches to the disease.

Literature search. The literature search was conducted across the PubMed, Scopus, Web of Science, ScienceDirect and Google Scholar databases. Search strategies incorporated combinations of the following terms: "canine pyometra", "dog pyometra", "medical treatment", "conservative treatment", "pharmacological treatment", "aglepristone", "prostaglandin F_{2α}", "PGF_{2α}", "cabergoline", "dopamine agonists", "antiprogesterins", "fertility", "reproductive outcome" and "ovariohysterectomy", combined using the Boolean operators AND and OR. Priority was given to peer-reviewed publications addressing the pathogenesis and clinical course of canine pyometra, its medical management and long-term reproductive outcomes.

Eligibility criteria. Original clinical studies, systematic reviews, retrospective and prospective studies, experimental investigations, clinical recommendations and individual case reports were considered eligible when they provided relevant evidence on conservative treatment of bitches with pyometra. The principal inclusion criteria were the availability of information on therapeutic protocols, clinical treatment efficacy, recurrence rates, complications and subsequent reproductive function.

Studies addressing exclusively surgical management without evaluating medical treatment were excluded, as were publications providing

insufficient information on clinical outcomes, duplicate reports and studies from which the efficacy or safety of the treatment could not be objectively assessed.

Study selection and analysis. Particular attention was given to the indications and contraindications for conservative treatment, the mechanisms of action of individual pharmacological agents, treatment protocols, patient-selection criteria, clinical efficacy, recurrence rates, adverse effects and the potential for preservation of reproductive function. Studies comparing medical treatment with ovariohysterectomy (OHE), the current standard treatment for canine pyometra, were evaluated separately.

Data synthesis. The available evidence was synthesised using a qualitative comparative approach. Study design, sample size, clinical form of pyometra, treatment protocol, criteria used to define treatment success, duration of follow-up and post-treatment reproductive outcomes were considered when interpreting the findings. Owing to substantial clinical and methodological heterogeneity among the available studies, quantitative meta-analysis was not undertaken.

Review limitations. Interpretation of the available evidence was constrained by considerable heterogeneity among the included studies in terms of patient-selection criteria, disease severity, pharmacological protocols, duration of follow-up and definitions of clinical success. These differences limit direct comparisons between studies and require cautious interpretation of the findings. Nevertheless, synthesis of the available evidence allowed current trends in the conservative management of canine pyometra to be identified, together with its principal advantages and limitations and the priorities for further research.

Results and discussions:

Pathogenetic rationale and patient-selection criteria for conservative treatment. The development of pyometra in bitches is closely associated with repeated luteal phases of the oestrous cycle (diestrus), during which the endometrium is exposed to sustained high concentrations of progesterone (Bagri et al., 2022; Contri et al., 2015; Ryzhykh et al., 2019; Sarkar et al., 2022). Progesterone stimulates secretory activity of the uterine glands, suppresses myometrial contractility, promotes cervical closure and locally attenuates immune responses, thereby reducing uterine resistance to bacterial infection (Krekeler and Hollinshead, 2023; Xavier et al., 2023; Gezer Güneş et al., 2025).

Prolonged progesterone exposure promotes the development of cystic glandular endometrial hyperplasia, while the accumulation of uterine secretions creates a favourable environment for bacterial colonisation (Hagman, 2018; Rocha et al., 2021; Xavier et al., 2024; Santana et al., 2024). *Escherichia coli* is the predominant bacterial pathogen associated with canine pyometra. Its virulence factors, particularly

fimbrial adhesins, facilitate effective attachment to the endometrial epithelium and subsequent colonisation of the uterus. The presence of the fimbrial adhesin genes *fimH*, *focG* and *papC* has been associated with *E. coli* pathogenicity and the severity of uterine lesions, including more extensive endometrial necrosis (Fransson and Ragle, 2003; Jitpean et al., 2014; Camozzi, 2020; Xavier et al., 2022, 2024).

The success of conservative treatment depends substantially on timely diagnosis, early assessment of clinical status and careful identification of patients suitable for medical management (McCobb et al., 2022; Hagman, 2022; Xavier et al., 2023; Lopes et al., 2025). Pharmacological treatment is most appropriate in clinically stable bitches without severe systemic complications or structural uterine changes requiring surgical intervention (Fieni et al., 2014; Lee et al., 2020; Xavier et al., 2023).

The principal criteria guiding the choice between conservative and surgical management are summarised in Table 1.

Conservative treatment cannot be regarded as a universally applicable option for all clinical presentations of canine pyometra. Successful pharmacological management requires appropriate differential diagnosis and strict adherence to physiological and clinical criteria for patient selection (Hagman, 2012; McCobb et al., 2022; Pannu et al., 2022; Lopes et al., 2025). Conservative treatment is contraindicated in animals with severe sepsis, uterine rupture, peritonitis, severe renal or hepatic dysfunction, or other evidence of severe systemic disease (Kumari Baithalu et al., 2010; Jitpean et al., 2016; McCobb et al., 2022; Hagman, 2023; Xavier et al., 2023).

The principal candidates for medical management are breeding bitches of reproductive age without severe concurrent systemic disease (Pannu et al., 2022; Krekeler and Hollinshead, 2023). Pharmacological treatment may be considered when the animal is clinically stable and there are no severe complications or structural uterine changes that increase the risk of uterine rupture (Fieni et al., 2014; Contri et al., 2015; Xavier et al., 2023).

The choice of therapeutic approach should take into account the underlying aetiology, clinical course and severity of the disease, the physiological and clinical status of the animal, and the presence of concurrent disorders (Niskanen and Thrusfield, 1998; Bigliardi et al., 2004; Jitpean et al., 2014; Berezovskyi and Kharenko, 2017; Sajida and Fadhli, 2023). Nevertheless, irrespective of the specific treatment selected, several general principles of clinical management should be followed (Bartoskova et al., 2007; Davidson and Black, 2015; Kutzler, 2019; Liao et al., 2020; Uddin, 2020; Nagashima et al., 2022; Vignesh et al., 2022).

Pharmacodynamics and pharmacological rationale for the use of antiprogestins. The introduction of synthetic progesterone receptor antagonists (antiprogestins) into veterinary practice has substantially broadened the scope for conservative management of canine pyometra, particularly in breeding animals for which preservation of reproductive function is a priority (Fieni et al., 2014; Krekeler and Hollinshead, 2023; Hagman, 2023).

This pharmacological class includes aglepristone (Alizin®) and mifepristone, which competitively bind to progesterone receptors in the endometrium, myometrium and cervix, thereby blocking the biological effects of endogenous progesterone (Breitkopf et al., 1997; Hoffmann et al., 2000; Chandrakar et al., 2021; Urmila et al., 2022; Xavier et al., 2023). The resulting withdrawal of progesterone-mediated signalling at the endometrial level mimics some of the physiological effects associated with luteolysis and reverses progesterone-dependent effects on the uterus and local immune function. Unlike prostaglandins, progesterone receptor antagonists do not exert a direct uterotonic effect (Hagman et al., 2006; Hagman, 2017).

Aglepristone is a synthetic steroidal antiprogestin that acts as a competitive antagonist at progesterone receptors and also exhibits antiglucocorticoid activity. Its binding affinity for progesterone receptors is approximately threefold greater than that of progesterone itself, enabling effective competitive blockade of progesterone-mediated signalling (Fieni

Table 1

Patient-selection criteria for conservative treatment of canine pyometra
(Based on the evidence synthesised from Fieni et al. (2014), Contri et al. (2015), Hagman (2022) and McCobb et al. (2022))

Parameter/criterion	Favourable prognosis (conservative treatment indicated)	Unfavourable prognosis (urgent ovariohysterectomy indicated)
Type of pyometra	Open-cervix pyometra, or closed-cervix pyometra in which cervical opening can be readily achieved with aglepristone	Closed-cervix pyometra with pronounced atonic uterine distension and thinning of the uterine wall
Age	Young to middle-aged bitch, preferably ≤5–6 years	Older bitch (>8–9 years) with recurrent disease
Endometrial status	Absence of severe cystic glandular endometrial hyperplasia	Severe cystic glandular endometrial hyperplasia and presence of follicular and/or luteal ovarian cysts
General clinical status	Clinically stable, with mild to moderate endotoxaemia	Sepsis, peritonitis, uterine rupture, or severe renal and/or hepatic dysfunction
Breeding value	High; preservation of reproductive function is required	No breeding value; non-breeding companion animal

et al., 2014; Melandri et al., 2019; Skliarov et al., 2019).

Aglepristone binds competitively and reversibly to progesterone receptors (Hoffmann and Schuler, 2000), necessitating repeated administration at defined intervals, as specified in the manufacturer's treatment protocol. The therapeutic effect of repeated aglepristone administration reflects the pharmacokinetic and pharmacodynamic properties of the molecule. Following subcutaneous injection, aglepristone is absorbed and eliminated slowly, with up to 24 days required for elimination of 80 % of the administered dose (Contri et al., 2015). Consequently, the active compound may remain in circulation for approximately 3 weeks after the onset of anoestrus. This prolonged antagonistic activity at progesterone receptors (Fieni, 2013) appears to have effects not only at the uterine level, where it may reduce the risk of recurrence, but also centrally (Galac et al., 2000), where treatment has been associated with a shorter interoestrous interval (Jurka et al., 2010).

Aglepristone also binds to hypothalamic progesterone receptors and may thereby modify progesterone-dependent feedback mechanisms within the hypothalamic–pituitary–gonadal axis, potentially contributing to earlier follicular development (Fieni et al., 2001a). Whereas aglepristone acts through competitive antagonism of progesterone receptors, prostaglandins exert a luteolytic effect (Gobello et al., 2003), directly reducing circulating progesterone concentrations (Kaya et al., 2014).

Aglepristone does not alter plasma concentrations of progesterone, prostaglandins, oxytocin or cortisol during the first 24 h after administration, although it has been reported to stimulate prolactin release within 12 h of injection (Fieni, 2014). Peak concentrations are reached approximately 2.5 days after injection, and pharmacological activity persists for approximately 6 days. By preventing progesterone from interacting with its target receptors, aglepristone attenuates or abolishes progesterone-mediated regulation of target tissues and organs. Progesterone receptor blockade also increases uterine responsiveness to uterotonic stimuli, thereby enhancing contractile activity and facilitating the evacuation of large amounts of purulent uterine discharge. This effect is frequently accompanied by rapid improvement in the general clinical condition of affected bitches (Fieni et al., 2014; Pesch, 2017; Hagman, 2018, 2023; Limmanont et al., 2021).

The therapeutic effects of antiprogestins in canine pyometra are mediated through several interrelated mechanisms:

- Opening of the cervical canal. Within the first 24–48 h after aglepristone administration, relaxation and opening of the cervix facilitate drainage of pathological uterine contents (Trasch et al., 2003; Contri et al., 2015; Xavier et al., 2023).
- Restoration of conditions favourable for uterine clearance. Reversal of the progesterone-dependent

state facilitates evacuation of pathological uterine contents and reduces the bacterial burden, thereby creating conditions conducive to resolution of the inflammatory process. Current evidence confirms that *E. coli* remains the predominant bacterial pathogen associated with canine pyometra, although its pathogenicity depends on a complex repertoire of virulence factors, including adhesins (Xavier et al., 2022; Ylhäinen et al., 2025).

Aglepristone is marketed as Alizin® (Virbac Laboratories, France) (Blendinger et al., 1997; Fieni et al., 2001b) and is currently the only drug in this pharmacological class registered for veterinary use (Hoffmann and Schuler, 2000). It is considered one of the most promising agents for conservative treatment because of its relatively limited adverse-effect profile. Alizin belongs to the pharmacological group of hormones and hormone antagonists and has been widely used in veterinary medicine for termination of pregnancy following unwanted mating in bitches (Fieni et al., 2014). Aglepristone may be administered alone or in combination with other therapeutic agents, including prostaglandins and systemic antimicrobials (Gürbulak et al., 2005; Verstegen et al., 2008).

Limitations associated with aglepristone treatment include individual hypersensitivity and the potential for allergic reactions. Its use is contraindicated in animals with impaired hepatic, renal or adrenal function and in those with diabetes mellitus. Treatment may also be relatively expensive in large dogs and does not eliminate the possibility of disease recurrence.

Mifepristone represents an alternative orally administered antiprogesterin. Its relative binding affinity for progesterone receptors is approximately fivefold greater than that of progesterone, allowing it to competitively inhibit progesterone signalling and thereby mimic some of the effects associated with luteolysis, including cervical relaxation (Philibert et al., 1985; Hoffmann et al., 2000; Verstegen et al., 2008).

Overall, antiprogestins, and aglepristone in particular, represent a central component of fertility-preserving pharmacological management of canine pyometra. By blocking progesterone receptors, these agents disrupt the progesterone-dependent mechanisms that maintain the pathological uterine environment and create conditions favourable for restoration of uterine drainage.

Uterotonic agents, particularly prostaglandin F2 α (PGF2 α) and its synthetic analogues, stimulate myometrial contractility and thereby promote evacuation of pathological contents from the uterine lumen. Their use, however, is subject to important limitations because of the potential for systemic adverse effects and complications when effective uterine drainage cannot be achieved. The pharmacological rationale for prostaglandin administration therefore depends not only on their uterotonic activity, but also

on cervical patency and the overall clinical status of the animal.

Conclusions:

1. Canine pyometra is a complex pathological process involving progesterone-dependent changes within the uterus, impairment of local defence mechanisms and bacterial infection. *Escherichia coli* is among the predominant bacterial pathogens associated with the disease.

2. Conservative treatment should be considered only in carefully selected patients, particularly clinically stable breeding bitches in which preservation of reproductive function is a priority. Severe systemic illness, sepsis, peritonitis, uterine rupture and substantial impairment of internal organ function represent major limitations to pharmacological management.

3. Antiprogestins, particularly aglepristone, form the cornerstone of the pharmacological approach to conservative management of canine pyometra. By blocking progesterone receptors, these agents disrupt the progesterone-dependent mechanisms that sustain the pathological uterine environment, promote cervical opening and facilitate evacuation of pathological uterine contents.

4. Prostaglandins and their synthetic analogues may complement antiprogestin therapy through their luteolytic effects and stimulation of myometrial contractility. However, their use requires careful consideration of cervical patency and the overall clinical status of the animal because of the risk of systemic adverse effects and complications when uterine drainage is inadequate.

References:

1. Adamovich-Rippe, K. N., Mayhew, P. D., Runge, J. J., Culp, W. T., Steffey, M. A., Mayhew, K. N., & Hunt, G. B. (2013). Evaluation of laparoscopic-assisted ovariohysterectomy for treatment of canine pyometra. *Veterinary Surgery*, 42(5), 572–578. <https://doi.org/10.1111/j.1532-950X.2013.12012.x>
2. Agostinho, J., de Souza, A., Schocken-Iturrino, R. P., Beraldo, L. G., Borges, C. A., Ávila, F. A., & Marin, J. M. (2014). *Escherichia coli* strains isolated from the uteri, horns, mouth, and rectum of bitches suffering from pyometra: virulence factors, antimicrobial susceptibilities, and clonal relationships among strains. *International Journal of Microbiology*, 2014, 979584. <https://doi.org/10.1155/2014/979584>
3. Antonov, A. L. (2015). Influence of some factors on the incidence of pyometra in the bitch. *Bulgarian Journal of Veterinary Medicine*, 18(4), 367–372. <https://doi.org/10.15547/bjvm.871>
4. Bagri, H. K., Sharma, M., Sethi, M., Shah, N., Baishya, A., Kumar, P., Bhakat, M., & Mohanty, T. K. (2022). An overview on etiopathogenesis of canine pyometra and its management. *The Pharma Innovation Journal*, SP-11(6), 1184–1188.
5. Bartoskova, A., Vitasek, R., Leva, L., & Faldyna, M. (2007). Hysterectomy leads to fast improvement of haematological and immunological parameters in bitches with pyometra. *Journal of Small Animal Practice*, 48(10), 564–568. <https://doi.org/10.1111/j.1748-5827.2007.00345.x>
6. Berezovskyi A. V., & Kharenko M. I. (Ed.). (2017). *Fiziologhiia ta patolohiia rozmnozheniia dribnykh tvaryn: navchalnyi posibnyk (2-e vydannia, pereroblene i dopovnene) [Physiology and pathology of reproduction of small animals: a textbook (2nd edition, revised and supplemented)]*. Zhytomyr: Polissia (in Ukrainian).
7. Bertero, A., Corró, M., Spagnolo, E., Nervo, T., & Rota, A. (2024). Antimicrobials administration, treatment outcome and bacterial susceptibility in canine pyometra cases subjected to ovariohysterectomy. *The Veterinary Journal*, 306, Article 106157. <https://doi.org/10.1016/j.tvjl.2024.106157>
8. Bhavya Charitha, B. V. S., Chaitanya, G., Jayathangaraj, M. G., & Chandaka, D. (2025). Canine pyometra – A review. *The Indian Veterinary Journal*, 102(3), 11–24.
9. Bigliardi, E., Parmigiani, E., Cavarani, S., Luppi, A., Bonati, L., & Corradi, A. (2004). Ultrasonography and cystic hyperplasia–pyometra complex in the bitch. *Reproduction in domestic animals*, 39(3), 136–140. <https://doi.org/10.1111/j.1439-0531.2004.00489.x>
10. Blendinger, K., Bostedt, H., & Hoffmann, B. (1997). Hormonal state and effects of the use of an antiprogestin in bitches with pyometra. *Journal of Reproduction and Fertility*, (51), 317–325.
11. Breitkopf, M., Hoffmann, B., & Bostedt, H. (1997). Treatment of pyometra (cystic endometrial hyperplasia) in bitches with an antiprogestin. *Journal of Reproduction and fertility*, (51), 327–331. PMID: 9404302
12. Camozzi, M. G. M. (2020). *Piometra em cadelas: agentes bacterianos, perfil de susceptibilidade antimicrobiana, histopatologia uterina e população folicular [Pyometra in bitches: Bacterial agents, antimicrobial susceptibility profile, uterine histopathology and follicular population]* [Master's dissertation, Universidade Federal de Goiás]. Cercomp UFG (in Portuguese). https://files.cercomp.ufg.br/weby/up/863/o/DISSERTA%C3%87%C3%83O_MYLENE_GUIMARAES_MARQUES_CAMOZZI.pdf
13. Camozzi, M. G. M., Waller, S. B., Castelhamo, E. C., Neves, A. L. S., Arrais, B. R., Pinto, J. F. N., Alves, B. G., & Moreira, C. N. (2026). Multidrug resistance of bacterial pathogens in canine pyometra. *Journal of Small Animal Practice*. <https://doi.org/10.1111/jsap.70110>
14. Chandrakar, U., Tiwari, R. P., Poyam, M. R., & Mishra, G. K. (2021). Efficacy of progesterone Receptor Antagonist for Treatment of Pyometra in Bitches. *Indian Journal of Veterinary Sciences & Biotechnology*, 17(4), 41–45.
15. Chang, S. K., Lo, D. Y., Wei, H. W., & Kuo, H. C. (2015). Antimicrobial resistance of *Escherichia coli* isolates from canine urinary tract infections. *Journal of Veterinary Medical Science*, 77(1), 59–65. <https://doi.org/10.1292/jvms.13-0281>
16. Contri, A., Gloria, A., Carluccio, A., Pantaleo, S., & Robbe, D. (2015). Effectiveness of a modified administration protocol for the medical treatment of canine pyometra. *Veterinary Research Communications*, (39), 1–5. <https://doi.org/10.1007/s11259-014-9619-9>, PMID: 25323020

17. Da Rosa Filho, R. R., Brito, M. M., Faustino, T. G., de Almeida, L. L., Manoel, V. C., Cogliati, B., & Vannucchi, C. I. (2021). Prostaglandin and antigestagen in pyometra bitches: vascular and stereological effect. *Reproduction & Fertility*, 2(2), 95–105. <https://doi.org/10.1530/RAF-20-0020>
18. Davidson, J., & Black, D. (2015). Small animal pyometra. *Small Animal Surgical Emergencies*, 397–402. <https://doi.org/10.1002/9781118487181.ch42>
19. Feldman, E. C. (2000). The cystic endometrial hyperplasia/pyometra complex and infertility in female dogs. *Textbook of Veterinary Internal Medicine disease of the dog and cat (5th ed, Eds.: S. Ettinger, and E. Feldman)* (p. 1549–1555). Philadelphia: WB Saunders Co.
20. Fieni, F. (2013, June). Medical treatment of uterine disease in dogs. In *Proceedings of the 16th EVSSAR Congress* (pp. 5–6). Toulouse, France.
21. Fieni, F., Marnet, P. G., Martal, J., Siliart, B., Touzeau, N., Bruyas, J. F., & Tainturier, D. (2001a). Comparison of two protocols with a progesterone antagonist aglepristone (RU534) to induce parturition in bitches. *Journal of Reproduction and Fertility*, (57), 237–242.
22. Fieni, F., Martal, J., Marnet, P. G., Siliart, B., Bernard, F., Riou, M., Bruyas, J. F., & Tainturier, D. (2001b). Hormonal variation after early or mid-pregnancy termination in bitches with aglepristone (RU534). *Journal of Reproduction and Fertility*, (57), 243–248.
23. Fieni, F., Topie, E., & Gogny, A. (2014). Medical treatment for pyometra in dogs. *Reproduction in Domestic Animals*, 49(s2), 28–32. <https://doi.org/10.1111/rda.12302>
24. Fransson, B. A., & Ragle, C. A. (2003). Canine pyometra: an update on pathogenesis and treatment. *Compendium*, 25(8), 602–612.
25. Gabor, G., Siver, L., & Szenci, O. (1999). Intravaginal prostaglandin f 2 α for the treatment of metritis and pyometra in the bitch. *Acta Veterinaria Hungarica*, 47(1), 103–108. <https://doi.org/10.1556/avet.47.1999.1.10>
26. Galac, S., Kooistra, H. S., Butinar, J., Bevers, M. M., Dieleman, S. J., Voorhout, G., & Okkens, A. C. (2000). Termination of mid-gestation pregnancy in bitches with aglepristone, a progesterone receptor antagonist. *Theriogenology*, 53(4), 941–950. [https://doi.org/10.1016/S0093-691X\(00\)00241-7](https://doi.org/10.1016/S0093-691X(00)00241-7)
27. Gezer Güneş, B., Günay Uçmak, Z., Koenhensi, L., Tarhan, D., Yalçın, İ. E., Or, M. E., Halaç, B., & Ak, S. (2025). Element status and inflammatory response in dogs with pyometra. *Journal of Trace Elements in Medicine and Biology*, 90, 127696. <https://doi.org/10.1016/j.jtemb.2025.127696>
28. Gobello, C., Castex, G., Klima, L., Rodriguez, R., & Corrada, Y. (2003). A study of two protocols combining aglepristone and cloprostenol to treat open cervix pyometra in the bitch. *Theriogenology*, 60(5), 901–908. [https://doi.org/10.1016/S0093-691X\(03\)00094-3](https://doi.org/10.1016/S0093-691X(03)00094-3)
29. Gürbulak, K. U. T. L. A. Y., Pancarci, Ş. M., Ekici, H., Konuk, C., Kirşan, I., Uçmak, M., & Seval, T. (2005). Use of aglepristone and aglepristone + intrauterine antibiotic for the treatment of pyometra in bitches. *Acta Veterinaria Hungarica*, 53(2), 249–255. <https://doi.org/10.1556/avet.53.2005.2.10>
30. Hagman, R. (2012). Clinical and molecular characteristics of pyometra in female dogs. *Reproduction in Domestic Animals*, (47), 323–325. <https://doi.org/10.1111/rda.12031>
31. Hagman, R. (2017). Canine pyometra: What is new?. *Reproduction in Domestic Animals*, (52), 288–292. <https://doi.org/10.1111/rda.12843>
32. Hagman, R. (2018). Pyometra in small animals. *Veterinary Clinics: Small Animal Practice*, 48(4), 639–661. <https://doi.org/10.1016/j.cvsm.2018.03.001>
33. Hagman, R. (2023). Pyometra in small animals 3.0. *Veterinary Clinics of North America: Small Animal Practice*, 53(5), 1223–1254. <https://doi.org/10.1016/j.cvsm.2023.04.009>
34. Hagman, R., & Greko, C. (2005). Antimicrobial resistance in *Escherichia coli* isolated from bitches with pyometra and from urine samples from other dogs. *Veterinary record*, 157(7), 193–197. <https://doi.org/10.1136/vr.157.7.193>
35. Hagman, R., Kindahl, H., & Lagerstedt, A.-S. (2006). Pyometra in bitches induces elevated plasma endotoxin and prostaglandin F 2 α metabolite levels. *Acta Veterinaria Scandinavica*, 47(55), 1–14. <https://doi.org/10.1186/1751-0147-47-55>
36. Harada, K., Niina, A., Nakai, Y., Kataoka, Y., & Takahashi, T. (2012). Prevalence of antimicrobial resistance in relation to virulence genes and phylogenetic origins among urogenital *Escherichia coli* isolates from dogs and cats in Japan. *American journal of veterinary research*, 73(3), 409–417. <https://doi.org/10.2460/ajvr.73.3.409>
37. Hegde, P. D., Renukaradhya, G. J., Suchitra, B. R., Naveen Kumar, S., Nagaraj, B. N., & Shantha Vardhan, M. (2025). Therapeutic efficacy of aglepristone and mifepristone for pyometra in dogs. *International Journal of Advanced Biochemistry Research*, 9(8), 1065–1070. <https://doi.org/10.33545/26174693.2025.v9.i8n.5416>
38. Hoffmann, B., & Schuler, G. (2000). Receptor blockers – general aspects with respect to their use in domestic animal reproduction. *Animal Reproduction Science*, 60, 295–312. [https://doi.org/10.1016/S0378-4320\(00\)00129-9](https://doi.org/10.1016/S0378-4320(00)00129-9)
39. Hoffmann, B., Lemmer, W., Bostedt, H., & Failing, K. (2000). Die Anwendung des Antigestagens Aglépristone zur konservativen Behandlung der Pyometra bei der Hündin. *Tierärztl Prax*, (28), 323–329 (in German).
40. Inoue, I., Shibata, S., & Fukata, T. (2013). Efficacy of fosfomycin on *Escherichia coli* isolated from bitches with pyometra. *Journal of Veterinary Medical Science*, 75(5), 657–658. <https://doi.org/10.1292/jvms.12-0489>
41. Jitpean, S., Ambrosen, A., Emanuelson, U., & Hagman, R. (2016). Closed cervix is associated with more severe illness in dogs with pyometra. *BMC Veterinary Research*, 13(1), 1–7. <https://doi.org/10.1186/s12917-016-0924-0>
42. Jitpean, S., Ström-Holst, B., Emanuelson, U., Höglund, O. V., Pettersson, A., Alneryd-Bull, C., & Hagman, R. (2014). Outcome of pyometra in female dogs and predictors of peritonitis and prolonged postoperative hospitalization in surgically treated cases. *BMC Veterinary Research*, 10(1), 1–12. <https://doi.org/10.1186/1746-6148-10-6>

43. Jurka, P., Max, A., Hawryńska, K., & Snochowski, M. (2010). Age-related pregnancy results and further examination of bitches after aglepristone treatment of pyometra. *Reproduction in domestic animals*, 45(3), 525–529. <https://doi.org/10.1111/j.1439-0531.2008.01288.x>
44. Kaya, D., Küçükaslan, I., Ağaoğlu, A. R., Ay, S. S., Schäfer-Somi, S., Emre, B., Bal, Y., Einspanier, A., Gürcan, İ. S., Gültiken, N., & Aslan, S. (2014). The effects of aglepristone alone and in combination with cloprostenol on hormonal values during termination of mid-term pregnancy in bitches. *Animal Reproduction Science*, 146(3–4), 210–217. <https://doi.org/10.1016/j.anireprosci.2014.03.002>
45. Kharenko, M. I., Ponomarenko, V. P., & Antonenko, O. A. (2003). Dynamika proiavu piometry u suk ryznykh porid ta efektyvnist metodiv yikh terapii [The dynamics of the manifestation of pyometra in bitches of different breeds and the effectiveness of methods of their therapy]. *Visnyk Sumskoho natsionalnoho ahrarnoho universytetu/Visnyk Sumskoho natsionalnoho ahrarnoho universytetu*, (10), 112–115 (in Ukrainian).
46. Kostyshyn, L.-M. Ye., Sachuk, R. M., Ivakhiv, M. A., Kostyshyn, Ye. Ye., & Kacaraba, O. A. (2022). Klinichna efektyvnist zastosuvannia veterynarnoho preparatu "Amoksydev 15" pry konservatyvnomu likuvanni suk za piometry [Clinical effectiveness of the use of the veterinary drug "Amoksidev 15" in the conservative treatment of bitches for pyometra]. *Naukovyi visnyk Lvivskoho natsionalnoho universytetu veterynarnoi medytsyny ta biotekhnologii imeni S. Z. Gzhytskoho*, 24(108), 51–58 (in Ukrainian). <https://doi.org/10.32718/nvlvet10808>
47. Krekeler, N., & Hollinshead, F. (2023). Pyometra. *Small Animal Soft Tissue Surgery*, (53), 659–671. <https://doi.org/10.1002/9781119693741.ch53>
48. Kumar, A., & Saxena, A. (2018). Canine pyometra: Current perspectives on causes and management – A review. *Indian Journal of Veterinary Sciences & Biotechnology*, 14(1), 52–56.
49. Kumari Baithalu, R., Maharana, B. R., Mishra, C., Sarangi, L., & Samal, L. (2010). Canine pyometra. *Veterinary world*, 3(7), 340–342.
50. Kutzler, M. (2019). Reproductive microbiome alterations: canine pyometra. *Clinical Theriogenology*, 11(4), 639–648. <https://doi.org/10.58292/ct.v11.9466>
51. Lansubakul, N., Sirinarumitr, K., Sirinarumitr, T., Imsilp, K., Wattananit, P., Supanrung, S., & Limmanont, C. (2022). First report on clinical aspects, blood profiles, bacterial isolation, antimicrobial susceptibility, and histopathology in canine pyometra in Thailand. *Veterinary World*, 15(7), 1804–1813. <https://doi.org/10.14202/vet>
52. Lavin, L. E., & Maki, L. C. (2023). Antimicrobial use in the surgical treatment of canine pyometra: A questionnaire survey of Arizona-licensed veterinarians. *Veterinary Medicine and Science*, 9(3), 1124–1133. <https://doi.org/10.1002/vms3.1130>
53. Lee, J. A., Kim, I. H., Kang, T. K., Hwang, D. Y., & Kang, H. G. (2020). Determination of possible prognostic indicators in dogs with pyometra. *Journal of Veterinary Clinics*, 37(4), 191–197. <https://doi.org/10.17555/jvc.2020.08.37.4.191>
54. Li, Z., Zhao, W., Deng, X., Yazlik, M. O., Özkan, H., Liu, S., Mei, L., Li, S., Zhan, J., & Hu, B. (2025). FOXP3 + T cells and immune dysregulation in canine pyometra. *Theriogenology*, 242, 117445. <https://doi.org/10.1016/j.theriogenology.2025.117445>
55. Liao, A. T., Huang, W. H., & Wang, S. L. (2020). Bacterial isolation and antibiotic selection after ovariohysterectomy of canine pyometra: A retrospective study of 55 cases. *Taiwan Veterinary Journal*, 46(02n03), 67–74. <https://doi.org/10.1142/S1682648520500067>
56. Lika, E., Rapti, D., Turmalaj, L., Gjino, P., & Robaj, A. (2011). Medical and surgical treatment of pyometra in dogs. *Macedonian Journal of Animal Science*, 1(2), 391–394.
57. Limmanont, C., Lertwatcharasarakul, P., Ponglowhapan, S., & Sirinarumitr, K. (2021). Molecular studies on oestrogen α and progesterone receptors and histomorphometric analysis of canine uteri following aglepristone treatment. *Reproduction in Domestic Animals*, 56(7), 1015–1023. <https://doi.org/10.1111/rda.13945>
58. Lopes, T. V., Kozicki, L. E., de Lima, P. H. L., de Lara, N. S., Silvestri, M., Vaz, E. S., Castella, R. M., Laskoski, L. M., & Souza, F. A. (2025). Antibiotic-free management of canine pyometra with aglepristone: Endocrine effects and post-treatment vaginal hyperplasia. *Reproduction in Domestic Animals*, 60(9), e70127. <https://doi.org/10.1111/rda.70127>
59. McCallin, A. J., Turner, J. W. C., & Kreisler, R. E. (2022). Pyometra Management in the Private Practice Setting. *Topics in Companion Animal Medicine*, (50), 100695. <https://doi.org/10.1016/j.tcam.2022.100695>
60. McCallin, A., Turner, J., & Kreisler, R. (2023). An Opportunity to Increase Access to Pyometra Treatment. *Journal of Shelter Medicine and Community Animal Health*, 2(3). <https://doi.org/10.56771/jsmcah.v2.53>
61. McCobb, E., Dowling-Guyer, S., Pailler, S., Intarapanich, N. P., & Rozanski, E. A. (2022). Surgery in a veterinary outpatient community medicine setting has a good outcome for dogs with pyometra. *Journal of the American Veterinary Medical Association*, 260(S2), S36–S41. <https://doi.org/10.2460/javma.21.06.0320>
62. Melandri, M., Veronesi, M. C., Pisu, M. C., Majolino, G., & Alonge, S. (2019). Fertility outcome after medically treated pyometra in dogs. *Journal of Veterinary Science*, 20(4), e39. <https://doi.org/10.4142/jvs.2019.20.e39>
63. Minami, S., Okamoto, Y., Eguchi, H., & Kato, K. (1997). Successful laparoscopy assisted ovariohysterectomy in two dogs with pyometra. *Journal of Veterinary Medical Science*, 59(9), 845–847. <https://doi.org/10.1292/jvms.59.845>
64. Nagashima, J. K., Gonçalves, L. A., Pereira, M. A., Talib, M. S., de Oliveira, C. M., Ambrósio, A. M., & Fantoni, D. T. (2022). Microcirculation assessment of dexmedetomidine constant rate infusion during anesthesia of dogs with sepsis from pyometra: a randomized clinical study. *Veterinary Anaesthesia and Analgesia*, 49(6), 536–545. <https://doi.org/10.1016/j.vaa.2022.07.005>
65. Niskanen, M., & Thrusfield, M. V. (1998). Associations between age, parity, hormonal therapy and breed, and pyometra in Finnish dogs. *Veterinary Record*, 143(18), 493–498. <https://doi.org/10.1136/vr.143.18.493>
66. Okkens, A. C., Kooistra, H. S., & Nickel, R. F. (1997). Comparison of long-term effects of ovariectomy versus ovariohysterectomy in bitches. *Journal of Reproduction and Fertility-Supplements only*, (51), 227–232.

67. Ovcharuk, N. P., & Kravchuk, O. O. (2016). Diahnostyka ta problema likuvannia piometrii u domashnikh sobak (zarubizhnyi ta vitchyzniani dosvid) [Diagnosis and problem of treatment of pyometra in domestic dogs (foreign and domestic experience)]. *Molodyi vchenyi*, 2(29), 173–177 (in Ukrainian).
68. Panasova, T. H., & Vilialova, P. T. (2021). Medykamentozna terapiia suk za piometry [Drug therapy of bitches for pyometra]. *Aktualni problemy nezaraznoi patolohii tvaryn: materialy Vseukrainskoi internet-konferentsii*. Poltava : PDAA pp. 54–57 (in Ukrainian).
69. Pannu, S. P., Pateer, D. P., Mehra, M., Meena, Y. K., & Kumar, P. (2022). Pathogenesis, diagnostic and therapeutic aspects of canine pyometra. *The Pharma Innovation Journal*, SP-11(7), 3314–3318.
70. Patil, A. S., Jayashree, P., Pugashetty, B. K., Anilkumar, G. K., & Tarasingh, D. L. (2021). Studies on comparative efficacy of hormonal and surgical treatments for CEH-pyometra complex in female dogs. *Journal of Experimental Zoology India*, 24(2), 1479–1482.
71. Pesch, S. G. (2017). Antiprogestins in Small Animal Reproduction. More than Induction of Abortion in Dogs. *Journal of Veterinary Science American Journal of Obstetrics & Gynecology – Special Topics*, 3(1), 24–31.
72. Philibert, D., Moguilewsky, M., Mary, I., Lecaque, D., Tournemine, C., Secchi, J., & Deraedt, R. (1985). Pharmacological profile of RU 486 in animals. In *The antiprogestin steroid RU 486 and human fertility control* (pp. 49–68). Boston, MA: Springer US. doi.org/10.1007/978-1-4684-1242-0_3
73. Ponomarova, O. S., & Derkach, S. S. (2012). Poshyrennia akusherskykh i hinekolohichnykh zakhvoriuvan u suk [Prevalence of obstetric and gynecological diseases in bitches]. *Materialy mizhnarodnoi naukovoï konferentsii*. Lviv : FOP B. I. Korpan (pp. 39–40) (in Ukrainian).
74. Porowska, E., Kulus, M., Jankowski, M., Kocherova, I., Jeseta, M., Chamier-Gliszczyńska, A., Stefańska, K., Borowiec, B., Bukowska, Dorota, Brüßow, K. P., Kempisty, B., & Antosik, P. (2018). Selected aspects of endometritis–pyometra complex in dogs – current troubles and treatment perspectives. *Medical Journal of Cell Biology*, 6(3), 108–113. https://doi.org/10.2478/acb-2018-0017
75. Reichler, I. M. (2009). Gonadectomy in cats and dogs: a review of risks and benefits. *Reproduction in Domestic Animals*, 44, 29–35. https://doi.org/10.1111/j.1439-0531.2009.01437.x
76. Rocha, M. F. G., Paiva, D. D. Q., Amando, B. R., Melgarejo, C. M. A., Freitas, A. S., Gomes, F. I. F., Ocadaque, C. J., Costa, C. L., Guedes, G. M. M., Lima-Neto, R. G., Cordeiro, R. A., Sidrim, J. J. C., & Castelo-Branco, D. S. C. (2022). Antimicrobial susceptibility and production of virulence factors by bacteria recovered from bitches with pyometra. *Reproduction in Domestic Animals*, 57(9), 1063–1073. https://doi.org/10.1111/rda.14181
77. Rocha, R. A., Ribeiro, W. M., de Almeida, J. A., Santos, A. L., Fernandes, M. R., Barbosa, M. S., de Moraes Filho, A. V., Carneiro, L. C. & da Silva, C. A. (2021). Detection of resistance genes in pyometra isolated bacteria in bitches. *Brazilian Journal of Veterinary Research and Animal Science*, 58, e173908–e173908. https://doi.org/10.11606/issn.1678-4456.bjvras.2021.173908
78. Rootwelt-Andersen, V., & Farstad, W. (2006). Treatment of pyometra in the bitch: A survey among Norwegian small animal practitioners. *European Journal of Companion Animal Practice*, 16(2), 195–198.
79. Ros, L., Holst, B. S., & Hagman, R. (2014). A retrospective study of bitches with pyometra, medically treated with aglepristone. *Theriogenology*, 82(9), 1281–1286. https://doi.org/10.1016/j.theriogenology.2014.08.011
80. Rosa Filho, R. R. D., Brito, M. M., Faustino, T. G., Almeida, L. L. D., Gardés, T. P., Leite, R. F., & Vannucchi, C. I. (2020). Clinical changes and uterine hemodynamic in pyometra medically treated bitches. *Animals*, 10(11), 2011. https://doi.org/10.3390/ani10112011
81. Ryzhykh, I., Kuchynska, I., Koreiba, L., Spitsyna, T., & Harashuk, M. (2019). Efektyvnist medykamentoznoho likuvannia khvorykh suk na piometru [Effectiveness of medical treatment of bitches with pyometra]. *Aktualni aspekty biolohii tvaryn, vetrynarnoi medytsyny ta vetrynarno-sanitarnoi ekspertyzy: materialy Mizhnarodnoi naukovo-praktychnoi konferentsii Dnipro* : DDAEU p. 57–58. (in Ukrainian).
82. Sajida, M. V. P., & Fadhli, M. R. (2023). Case Report: Management of Closed Pyometra on a 7 Year Old Bitch. *Media Kedokteran Hewan*, 34(3), 183–188. https://doi.org/10.20473/mkh.v34i3.2023.183-188
83. Santana, C. H., Souza, M. F., da Silva, L. A., de Souza, L. D. R., Santana, A. M., Oliveira, A. R., da Paixão, T. A. & Santos, R. L. (2024). Predisposing factors for pseudoploplacental endometrial hyperplasia or cystic endometrial hyperplasia in dogs and their association with pyometra. (2025). *Veterinary Sciences*, 12(1), 1. https://doi.org/10.3390/vetsci12010001
84. Sarkar, P., Ghosh, C. K., Kumar, K., Shee, A., Basu, S., Kumar, S., & Roy, A. (2022). Medical management of closed pyometra in a bitch: A case report. *The Pharma Innovation Journal*, SP-11(7), 584–586.
85. Sethi, G. P. S., Gandotra, V. K., Honparkhe, M., Singh, A. K., Arora, A. K., & Ghuman, S. P. S. (2020). Efficacy of Antiprogesterone and PGF2α Therapy for Treating Canine Pyometra. *International Journal of Current Microbiology and Applied Sciences*, 9(2), 2117–2123. https://doi.org/10.20546/ijcmas.2020.902.240
86. Silva, E., Silva, M. F., Henriques, S., Diniz, P., Carneiro, C., Lopes-da-Costa, L., & Mateus, L. (2020). The role of uteropathogenic *Escherichia Coli* in the development of canine pyometra. *Advances in Animal Health, Medicine and Production: A Research Portrait of the Centre for Interdisciplinary Research in Animal Health (CIISA), University of Lisbon, Portugal*, 510–527. https://doi.org/10.1007/978-3-030-61981-7_28
87. Singh, L. K., Patra, M. K., Mishra, G. K., Linda, N., Saxena, A. C., De, U. K., Kumar, H. & Narayanan, K. (2019). Comparative efficacy of antiprogestin and dopamine agonist in the treatment of canine pyometra. *The Indian Journal of Animal Reproduction*, 40(2), 28–31.
88. Skliarov, P. M., & Piatybrat, V. V. (2021). Diahnostychni aspekty piometry suk (ohliadova informatsiia). [Diagnostic aspects of female pyometra (review information)]. *Naukovyi visnyk vetrynarnoi medytsyny*, (2), 18–36 (in Ukrainian). https://oi.org/10.33245/2310-4902-2021-168-2-18-36

89. Skliarov, P. M., Chumak, V. O., Koreiba, L. V., Vakulyk, V. V., & Riabokon, V. M. (2019). Preparaty, shcho zastosovuiutsia u reproduksii sobak i kotiv [Drugs used in the reproduction of dogs and cats]. *Dnipro: RVV DDAEU* (in Ukrainian).
90. Trasch, K., Wehrend, A., & Bostedt, H. (2003). Follow-up examinations of bitches after conservative treatment of pyometra with the antigestagen aglepristone. *Journal of Veterinary Medicine Series A*, 50(7), 375–379. <https://doi.org/10.1046/j.1439-0442.2003.00557.x>
91. Tsumagari, S., Ishinazaka, T., Kamata, H., Ohba, S., Tanaka, S., Ishii, M., & Memon, M. A. (2005). Induction of canine pyometra by inoculation of *Escherichia coli* into the uterus and its relationship to reproductive features. *Animal Reproduction Science*, 87(3–4), 301–308. <https://doi.org/10.1016/j.anireprosci.2004.11.006>
92. Ucmak, M., & Tek, C. (2008). Comparison of the efficacy of different methods on the medical treatment of cystic endometrial hyperplasia-pyometra complex in bitches. *Bulletin of the Veterinary Institute in Pulawy*, 52(2), 231–234.
93. Uddin, S. (2020). *A clinical case report on pyometra in a German shepherd dog*. Chattogram Veterinary and Animal Sciences University Chattogram-4225, Bangladesh.
94. Urmila, K., Reddy, K. C., Venkataramana, K., & Nagaraj, P. (2022). Comparative study of efficacy on mifepristone and intravaginal PGF_{2α} in pyometra in bitches. *The Pharma Innovation Journal*, 11(6S), 1411–1414.
95. Verstegen, J., Dhaliwal, G., & Verstegen-Onclin, K. (2008). Mucometra, cystic endometrial hyperplasia, and pyometra in the bitch: advances in treatment and assessment of future reproductive success. *Theriogenology*, 70(3), 364–374. <https://doi.org/10.1016/j.theriogenology.2008.04.036>
96. Vignesh, M., Vasu, J., Nivedha, D., Srinivas, M. V., Iyyanar, S., & Mukhopadhyay, H. K. (2022). Isolation and Antibigram of *Escherichia coli* from Canine Pyometra in Puducherry Region. *Indian Journal of Veterinary Sciences & Biotechnology*, 18(5), 130–133. <https://doi.org/10.48165/ijvsbt.18.5.27>
97. Waters, D. J., Kengeri, S. S., Maras, A. H., Suckow, C. L., & Chiang, E. C. (2017). Life course analysis of the impact of mammary cancer and pyometra on age-anchored life expectancy in female Rottweilers: implications for envisioning ovary conservation as a strategy to promote healthy longevity in pet dogs. *The Veterinary Journal*, (224), 25–37. <https://doi.org/10.1016/j.tvjl.2017.05.006>
98. Xavier, R. G. C., Santana, C. H., de Castro, Y. G., de Souza, T. G. V., do Amarante, V. S., Santos, R. L., & Silva, R. O. S. (2023). Canine Pyometra: A Short Review of Current Advances. *Animals*, 13(21), 3310. <https://doi.org/10.3390/ani13213310>
99. Xavier, R. G. C., Santana, C. H., Silva, P. H. S., Paraguassú, A. O., Nicolino, R. R., Freitas, P. M. C., Santos, R. L., & Silva, R. O. S. (2024). Association between bacterial pathogenicity, endometrial histological changes and clinical prognosis in canine pyometra. *Theriogenology*, 214, 118–123. <https://doi.org/10.1016/j.theriogenology.2023.10.007>
100. Xavier, R. G. C., da Silva, P. H. S., Trindade, H. D., Carvalho, G. M., Nicolino, R. R., Freitas, P. M. C., & Silva, R. O. S. (2022). Characterization of *Escherichia coli* in dogs with pyometra and the influence of diet on the intestinal colonization of extraintestinal pathogenic *E. coli* (ExPEC). *Veterinary Sciences*, 9(5), 245. <https://doi.org/10.3390/vetsci9050245>
101. Ylhäinen, A., Mölsä, S., Thomson, K., Laitinen-Vapaavuori, O., Rantala, M., & Grönthal, T. (2025). Bacteria associated with canine pyometra and concurrent bacteriuria: A prospective study. *Veterinary Microbiology*, 301, 110362. <https://doi.org/10.1016/j.vetmic.2024.110362>
102. Yoon, H. Y., Byun, J. Y., Park, K. H., Min, B. S., & Kim, J. H. (2017). Sterile pyometra in two dogs. *Immune network*, 17(2), 128–131. <https://doi.org/10.4110/in.2017.17.2.128>
103. Zhbyr, A. M., & Skliarov, P. M. (2022). Porivnialna efektyvnist konservatyvnoho ta operatyvnoho likuvannia suk z piometroi [Comparative effectiveness of conservative and operative treatment of bitches with pyometra]. *Rozvytok doslidzhen, praktyky ta osvity: materialy XVIII Mizhnarodnoi naukovo-praktychnoi konferentsii Florence* (pp. 665–671) (in Ukrainian). <https://doi.org/10.46299/ISG.2022.1.18>

Склярів П. М., доктор ветеринарних наук, професор, Дніпровський державний аграрно-економічний університет, м. Дніпро, Україна

Вакулик В. В., кандидат історичних наук, доцент, Дніпровський державний аграрно-економічний університет, м. Дніпро, Україна

Білий Д. Д., доктор ветеринарних наук, професор, Дніпровський державний аграрно-економічний університет, м. Дніпро, Україна

Милостивий Р. В., кандидат ветеринарних наук, доцент, Дніпровський державний аграрно-економічний університет, м. Дніпро, Україна

Чекан О. М., доктор ветеринарних наук, професор, Сумський національний аграрний університет, м. Суми, Україна

Консервативне лікування піометри у собак. Частина I: патогенез, відбір пацієнтів та фармакологічні основи

Піометра у сук є тяжким захворюванням репродуктивної системи, патогенез якого пов'язаний із тривалим прогестероновим впливом у дієструзі, змінами ендометрію, порушенням локального імунного захисту та бактеріальною колонізацією матки.

Метою роботи було узагальнити сучасні наукові дані щодо патогенезу піометри, критеріїв відбору пацієнтів для консервативного лікування та фармакологічного обґрунтування основних медикаментозних підходів.

Дослідження виконано у форматі систематичного огляду літератури. Пошук здійснювали у базах PubMed, Scopus, Web of Science, ScienceDirect та Google Scholar за комбінаціями термінів, пов'язаних із піометрою у собак,

консервативним лікуванням, аглепристоном, простагландинами, антигестагенами та репродуктивними наслідками. До аналізу включали клінічні та експериментальні дослідження, систематичні огляди та клінічні рекомендації. Через значну неоднорідність доступних публікацій кількісний метааналіз не проводили.

Узагальнені дані показали, що тривала дія прогестерону сприяє секреторним змінам і залозисто-кістозній гіперплазії ендометрію, зниженню скоротливої активності міометрію, закриттю шийки матки та пригніченню локальної імунної відповіді, створюючи умови для бактеріальної колонізації. Важливе місце в патогенезі посідає *Escherichia coli*, хоча мікробіологічний спектр піометри є ширшим.

Ефективність консервативної терапії залежить від своєчасної діагностики, клінічного стану та правильного відбору пацієнтів. Найбільш придатними є клінічно стабільні племінні суки без тяжких системних ускладнень; за сепсису, перитоніту, розриву матки або тяжкої ниркової чи печінкової недостатності консервативний підхід є недоцільним.

Антигестагени, насамперед аглепристон, становлять основу фармакологічного підходу: блокада прогестеронових рецепторів сприяє відкриттю шийки матки та евакуації патологічного вмісту. Міфепристон розглядається як альтернативний антигестаген. Простагландини стимулюють скоротливу активність міометрію, але їх застосування потребує врахування прохідності шийки матки та загального стану тварини через ризик побічних реакцій.

Отже, консервативне лікування піометри потребує диференційованого відбору пацієнтів. Антигестагени, передусім аглепристон, мають ключове значення, тоді як застосування простагландинів повинно визначатися клінічною ситуацією та можливістю ефективного дренивання матки.

Ключові слова: піометра, суки, консервативне лікування, аглепристон, антигестагени, простагландини, репродуктивна функція.

Дата першого надходження статті до видання: 27.07.2026

Дата прийняття статті до друку після рецензування: 09.09.2026

Дата публікації (оприлюднення) статті: 21.09.2026



Стаття поширюється на умовах ліцензії відкритого доступу (CC BY 4.0)