d) For prophylaxis: Exposed birds are given 25 mg/kg IM once (give IM with caution as it is very irritating), and then acyclovir is added to drinking water at 1 mg/mL and to the food at 400 mg/quart of seed for a minimum of 7 days. Quaker parrots have been treated with a gavage of acyclovir at 80 mg/kg q8h for 7 days. (Johnson-Delaney 2005b)

■ **CATS:**

For Herpesvirus-1 infections:

a) 10–25 mg/kg PO twice daily. Never begin therapy until diagnostic evaluation is completed. May be toxic in cats; monitor CBC every 2–3 weeks. (Lappin 2003b)

■ **HORSES:**

a) Although efficacy is undetermined, anecdotal use of acyclovir orally at 10 mg/kg PO 5 times daily or 20 mg/kg PO q8h may have had some efficacy in preventing or treating horses during EHV-1 outbreaks. Additional studies may further clarify the usefulness of such dosing regimens—Plumb 2007; based upon (Wilkins 2004a) & (Henninger, Reed et al. 2007)

Monitoring

■ Renal function tests (BUN, Serum Cr) with prolonged or IV therapy

■ Cats: CBC

Chemistry/Synonyms

An antiviral agent, acyclovir (also known as ACV or acycloguanosine), occurs as a white, crystalline powder. 1.3 mg are soluble in one mL of water. Acyclovir sodium has a solubility of greater than 100 mg/mL in water. However, at a pH of 7.4 at 37°C it is practically all unionized and has a solubility of only 2.5 mg/mL in water. There is 4.2 mEq of sodium in each gram of acyclovir sodium.

Acyclovir may be known as: aciclovirum, acycloguanosine, acyclovir, BW-248U, *Zovirax®*, *Acic®*, *Aciclobene®*, *Aciclotyrol®*, *Acivir®*, *Acyrax®*, *Cicloviral®*, *Geavir®*, *Geavir®*, *Herpotern®*, *Isavir®*, *Nycovir®*, *Supraviran®*, *Viclovir®*, *Virherpes®*, *Viroxy®*, *Xorox®*, or *Zovirax®*.

Storage/Stability/Compatibility

Acyclovir capsules and tablets should be stored in tight, light resistant containers at room temperature. Acyclovir suspension and sodium sterile powder should be stored at room temperature.

When reconstituting acyclovir sodium do not use bacteriostatic water with parabens as precipitation may occur. The manufacturer does not recommend using bacteriostatic water for injection with benzyl alcohol because of the potential toxicity in neonates. After reconstitution with 50–100 mL of a standard electrolyte or dextrose solution, the resulting solution is stable at 25°C for 24 hours. Acyclovir is reportedly **incompatible** with biologic or colloidial products (*e.g.*, blood products or protein containing solutions). It is also **incompatible** with dopamine HCl, dobutamine, fludarabine phosphate, foscarnet sodium, meperidine and morphine sulfate. Many other drugs have been shown to be **compatible** in specific situations. Compatibility is dependent upon factors such as pH, concentration, temperature and diluent used; consult specialized references or a hospital pharmacist for more specific information.

Dosage Forms/Regulatory Status

VETERINARY-LABELED PRODUCTS: None

HUMAN-LABELED PRODUCTS:

Acyclovir Tablets: 400 mg & 800 mg; *Zovirax®* (GlaxoWellcome); generic; (Rx)

Acyclovir Capsules: 200 mg; *Zovirax®* (GlaxoWellcome); generic; (Rx)

Acyclovir Suspension: 200 mg/5 mL in 473 mL; *Zovirax®* (GlaxoWellcome); generic; (Rx)

Acyclovir Sodium Injection (for IV infusion only): 50 mg/mL (as sodium): generic; (Rx)

Acyclovir Powder for Injection: 500 mg/vial (as sodium) in 10 mL vials; 1000 mg/vial (as sodium) in 20 mL vials; 500 mg/vial Lyophilized in 10 mL vials; *Zovirax®* (GlaxoWellcome); generic; (Rx)

Acyclovir Ointment: 5% (50 mg/g) in 15 g; *Zovirax®* (Biovail); (Rx)

Acyclovir Cream: 5% (50 mg/g) in 2g tubes; *Zovirax®* (Biovail); (Rx)

AGLEPRISTONE

(a-gle-*pris*-tone) Alizin®, Alizine®

INJECTABLE PROGESTERONE BLOCKER

Prescriber Highlights

- **Injectable progesterone blocker indicated for pregnancy termination in bitches; may also be of benefit in inducing parturition or in treating pyometra complex in dogs & progesterone-dependent mammary hyperplasia in cats**
- **Not currently available in USA; marketed for use in dogs in Europe, South America, etc.**
- **Localized injection site reactions are most commonly noted adverse effect; other adverse effects reported in >5% of patients include: anorexia (25%), excitation (23%), depression (21%), & diarrhea (13%)**

Uses/Indications

Aglepristone is labeled (in the U.K. and elsewhere) for pregnancy termination in bitches up to 45 days after mating.

In dogs, aglepristone may prove useful in inducing parturition or treating pyometra complex (often in combination with a prostaglandin F analog such as cloprostenol).

In cats, it may be of benefit for pregnancy termination (one study documented 87% efficacy when administered at the recommended dog dose at day 25) or in treating mammary hyperplasias or pyometras.

Pharmacology/Actions

Aglepristone is a synthetic steroid that binds to the progesterone (P4) receptors thereby preventing biological effects from progesterone. It has an affinity for uterine progesterone receptors approximately three times that of progesterone. As progesterone is necessary for maintaining pregnancy, pregnancy can be terminated or parturition induced. Abortion occurs within 7 days of administration.

Benign feline mammary hyperplasias (fibroadenomatous hyperplasia; FAHs) are usually under the influence of progesterone and aglepristone can be used to medically treat this condition.

When used for treating pyometra in dogs, aglepristone can cause opening of the cervix and resumption of miometral contractility.

Within 24 hours of administration, aglepristone does not appreciably affect circulating plasma levels of progesterone, cortisol, prostaglandins or oxytocin. Plasma levels of prolactin are increased within 12 hours when used in dogs during mid-pregnancy which is probably the cause of mammary gland congestion often seen in these dogs.

Aglepristone also binds to glucocorticoid receptors but has no glucocorticoid activity; it can prevent endogenous or exogenously administered glucocorticoids from binding and acting at these sites.

Pharmacokinetics

In dogs, after injecting two doses of 10mg/kg 24 hours apart, peak serum levels occur about 2.5 days later and mean residence time is about 6 days. The majority (90%) of the drug is excreted via the feces.

Contraindications/Precautions/Warnings

Aglepristone is contraindicated in patients who have documented hypersensitivity to it and during pregnancy, unless used for pregnancy termination or inducing parturition.

Because of its antagonistic effects on glucocorticoid receptors, the drug should not be used in patients with hypoadrenocorticism or in dogs with a genetic predisposition to hypoadrenocorticism.

The manufacturer does not recommend using the product in patients in poor health, with diabetes, or with impaired hepatic or renal function as there is no data documenting its safety with these conditions.

Adverse Effects

As the product is in an oil-alcohol base, localized pain and inflammatory reactions (edema, skin thickening, ulceration, and localized lymph node enlargement) can be noted at the injection site. Resolution of pain generally occurs shortly after injection; other injection site reactions usually resolve within 2–4 weeks. The manufacturer recommends light massage of the injection site after administration. Larger dogs should not receive more than 5 mL at any one subcutaneous injection site. One source states that severe injection reactions can be avoided if the drug is administered into the scruff of the neck.

Systemic adverse effects reported from field trials include: anorexia (25%), excitation (23%), depression (21%), vomiting (2%), diarrhea (13%) and uterine infections (3.4%). Transient changes in hematologic (RBC, WBC indices) or biochemical (BUN, creatinine, chloride, potassium, sodium, liver enzymes) laboratory parameters were seen in <5% of dogs treated.

When used for pregnancy termination, a brown mucoid vaginal discharge can be seen approximately 24 hours before fetal expulsion. This discharge can persist for an additional 3–5 days. If used in bitches after the 20th day of gestation, abortion may be accompanied with other signs associated with parturition (*e.g.*, inappetance, restlessness, mammary congestion).

Bitches may return to estrus in as little as 45 days after pregnancy termination.

Reproductive/Nursing Safety

Unless used for pregnancy termination or at term to induce parturition, aglepristone is contraindicated during pregnancy.

One study (Baan, Taverne et al. 2005) using aglepristone to induce parturition (day 58) demonstrated no significant differences in weight gain between those puppies in the treatment group versus the control group suggesting that aglepristone did not have effect on milk production of treated bitches.

Overdosage/Acute Toxicity

When administered at 3X (30mg/kg) recommended doses, bitches demonstrated no untoward systemic effects. Localized reactions were noted at the injection site, presumably due to the larger volumes injected.

Drug Interactions

No documented drug interactions were noted. Theoretically, the following interactions may occur with aglepristone:

- **PROGESTINS** (**natural** or **synthetic**): Could reduce the efficacy of aglepristone
- **GLUCOCORTICOIDS:** Aglepristone could reduce the efficacy of glucocorticoid treatment
- **KETOCONAZOLE, ITRACONAZOLE, ERYTHROMYCIN:** The manufacturer states that although there is no data, these drugs may interact with aglepristone

Laboratory Considerations

None were noted

Doses

WARNING: As accidental injection of this product can induce abortion; it should not be administered or handled by pregnant women. Accidental injection can also cause severe pain, intense swelling and ischemic necrosis that can lead to serious sequelae, including loss of a digit. In cases of accidental injection, prompt medical attention must be sought.

- **DOGS:**

  To terminate pregnancy (up to day 45):

  a) 10 mg/kg (0.33 mL/kg) subcutaneous injection only. Repeat one time, 24 hours after the first injection. A maximum of 5 mL should be injected at any one site. Light massage of the injection site is recommended after administration. (Label information; *Alizin*®—Virbac U.K.)

  To induce parturition:

  a) After day 58 of pregnancy: 15 mg/kg subcutaneously one time. 24 hours after aglepristone injection, give oxytocin 0.15 Units/kg every 2 hours until the end of parturition. (Fieni, Bruyas et al. 2001)

  b) On or after day 58 of pregnancy: 15 mg/kg subcutaneously; repeat in 9 hours. In treated group, expulsion of first pup occurred between 32 and 56 hours after treatment. Use standard protocols to assist with birth (including oxytocin to assist in pup expulsion if necessary) or to intervene if parturition does not proceed. (Baan, Taverne et al. 2005)

  As an adjunct to treating pyometra/metritis:

  a) For closed cervix: 6 mg/kg twice daily on the first day followed by the same dose once daily on days 2, 3, and 4. Some prefer using larger doses (10mg/kg) once daily on days 1, 3,and 8, then follow up also on days 15 and 28 depending on the bitch's condition. (Romagnoli 2003a)

  b) For metritis: 10 mg/kg subcutaneously once daily on days 1, 2 and 8.

  For open or closed pyometra: aglepristone 10 mg/kg subcutaneously once daily on days 1, 2 and 8 and cloprostenol 1 mcg/kg subcutaneously on days 3 to 7. Bitches with closed pyometra or with elevated temperature or dehydration should also receive intravenous fluids and antibiotics (*e.g.*, amoxicillin/clavulanate at 24 mg/kg/day on days 1–5). If pyometra has not resolved, additional aglepristone doses should be given on days 14 and 28. (Fieni 2006)

- **CATS:**

  For treating mammary fibroadenomatous hyperplasia:

  a) 20 mg/kg aglepristone subcutaneously once weekly until resolution of signs. Cats who present with heart rates greater than 200 BPM should receive atenolol at 6.25 mg (total dose) until heart rate is less than 200 BPM with regression in size of the mammary glands. (Gorlinger, Kooistra et al. 2002)

Monitoring
- Clinical efficacy
- For pregnancy termination: ultrasound 10 days after treatment and at least 30 days after mating
- Adverse effects (see above)

Client Information
- Only veterinary professionals should handle and administer this product
- When used for pregnancy termination in the bitch, clients should understand that aglepristone might only be 95% effective in terminating pregnancy when used between days 26–45
- A brown mucoid vaginal discharge can be seen approximately 24 hours before fetal expulsion
- Bitch may exhibit the following after treatment: lack of appetite, excitement, restlessness or depression, vomiting, or diarrhea
- Clients should be instructed to contact veterinarian if bitch exhibits a purulent or hemorrhagic discharge after treatment or if vaginal discharge persists 3 weeks after treatment

Chemistry/Synonyms
Aglepristone is a synthetic steroid. The manufactured injectable dosage form is in a clear, yellow, oily, non-aqueous vehicle that contains arachis oil and ethanol. No additional antimicrobial agent is added to the injection.

Aglepristone may also be known as RU-534, *Alizine*®, or *Alizin*®.

Storage/Stability/Compatibility
Aglepristone injection should be stored below 25°C and protected from light. The manufacturer recommends using the product within 28 days of withdrawing the first dose.

Although no incompatibilities have been reported, due to the product's oil/alcohol vehicle formulation it should not be mixed with any other medication.

Dosage Forms/Regulatory Status
VETERINARY-LABELED PRODUCTS:

Note: Not presently available or approved for use in the USA. In several countries:

Aglepristone 30 mg/mL in 5 mL and 10 mL vials; *Alizine*® or *Alizin*® (Virbac); (Rx)

The FDA may allow legal importation of this medication for compassionate use in animals; for more information, see the *Instructions for Legally Importing Drugs for Compassionate Use in the USA* found in the appendix.

HUMAN-LABELED PRODUCTS: None

ALBENDAZOLE

(al-***ben***-da-zole) Albenza®, Valbazen®

ANTIPARASITIC

Prescriber Highlights
- **Broad spectrum against a variety of nematodes, cestodes & protozoa; labeled for cattle & sheep (suspension only)**
- **Contraindicated with hepatic failure, pregnancy, lactating dairy cattle**
- **May cause GI effects (including hepatic dysfunction) & rarely blood dyscrasias (aplastic anemia)**
- **Do not use in pigeons, doves or crias**

Uses/Indications
Albendazole is labeled for the following endoparasites of cattle (not lactating): *Ostertagia ostertagi, Haemonchus* spp., *Trichostrongylus* spp., *Nematodius* spp., *Cooperia* spp., *Bunostomum phlebotomum, Oesphagostomum* spp., *Dictacaulus vivaparus* (adult and 4th stage larva), *Fasciola hepatica* (adults), and *Moniezia* spp.

In sheep, albendazole is approved for treating the following endoparasites: *Ostertagia circumcincta, Marshallagia marshalli, Haemonchus contortus*, *Trichostrongylus* spp., *Nematodius* spp., *Cooperia* spp., *Oesphagostomum* spp., *Chibertia ovina*, *Dictacaulus filaria*, *Fasciola hepatica*, *Fascioides magna*, *Moniezia expansa*, and *Thysanosoma actinoides*.

Albendazole is also used (extra-label) in small mammals, goats and swine for endoparasite control.

In cats, albendazole has been used to treat *Paragonimus kellicotti* infections. In dogs and cats, albendazole has been used to treat capillariasis. In dogs, albendazole has been used to treat Filaroides infections. It has been used for treating giardia infections in small animals, but concerns about bone marrow toxicity have diminished enthusiasm for the drug's use.

Pharmacology/Actions
Benzimidazole antiparasitic agents have a broad spectrum of activity against a variety of pathogenic internal parasites. In susceptible parasites, their mechanism of action is believed due to disrupting intracellular microtubular transport systems by binding selectively and damaging tubulin, preventing tubulin polymerization, and inhibiting microtubule formation. Benzimidazoles also act at higher concentrations to disrupt metabolic pathways within the helminth, and inhibit metabolic enzymes, including malate dehydrogenase and fumarate reductase.

Pharmacokinetics
Pharmacokinetic data for albendazole in cattle, dogs and cats was not located. The drug is thought better absorbed orally than other benzimidazoles. Approximately 47% of an oral dose was recovered (as metabolites) in the urine over a 9-day period.

After oral dosing in sheep, the parent compound was either not detectable or only transiently detectable in plasma due to a very rapid first-pass effect. The active metabolites, albendazole sulphoxide and albendazole sulfone, reached peak plasma concentrations 20 hours after dosing.