Client Information
- For outpatient administration, training in proper injection techniques, drug handling and storage should be performed

Chemistry/Synonyms
A biosynthetic form of the glycoprotein human hormone erythropoietin, epoetin alfa (EPO) has a molecular weight of approximately 30,000. It is commercially available as a sterile, preservative-free, colorless solution. Sodium chloride solution is added to adjust tonicity and is buffered with sodium citrate or citric acid. Human albumin (2.5 mg per vial) is also added to the solution.

Epoetins may also be known by the following synonyms and internationally registered trade names: erythropoietin, r-HuEPO, BI-71.052 (epoetin gamma), BM-06.019 (epoetin beta), EPO (epoetin alfa), EPOCH (epoetin beta), *Bioyetin®*, *Culat®*, *Epogin®*, *Epomax®*, *Epopen®*, *Epotin®*, *Epoxitin®*, *Eprex®*, *Erantin®*, *Eritina®*, *Eritrogen®*, *Eritromax®*, *Erypo®*, *Espo®*, *Exetin-A®*, *Globuren®*, *Hemax®*, *Hemax-Eritron®*, *Hypercri®*, *Mepotin®*, *NeoRecormon®*, *Neorecormon®*, *Procrit®*, *Pronivel®*, *Recormon®*, *Repotin®*, *Tinax®*, and *Wepox®*.

Storage/Stability/Compatibility
The injectable solution should be stored in the refrigerator (2-8°C); do not freeze. Do not shake the solution as denaturation of the protein with resultant loss of activity may occur. If light exposure is limited to 24 hours or less, no effects on potency should occur. When stored as directed, the solution has an expiration date of 2 years after manufacture. Do not mix with other drugs or use the same IV tubing with other drugs running. Because the solution contains no preservatives, the manufacturer recommends using each vial only as a single use.

A method of diluting the Amgen product to facilitate giving very small dosages has been described (Grodsky 1994). Using a 1:20 dilution (1 part *Epogen®* to 19 parts bacteriostatic normal saline does not require any additional albumin to prevent binding of the drug to container). No data is available commenting on this dilution's stability.

Dosage Forms/Regulatory Status
VETERINARY-LABELED PRODUCTS: None

The ARCI (Racing Commissioners International) has designated this drug as a class 2 substance. It is also prohibited on the premises of a racing facility.

HUMAN-LABELED PRODUCTS:

Epoetin Alfa, Recombinant for Injection: 2000 units/mL, 3000 units/mL, 4000 units/mL, 10,000 units/mL, 20,000 units/mL and 40,000 units/mL in 1 mL and 2 mL (10,000U only) both single-dose and multidose vials; *Epogen®* (Amgen), *Procrit®* (Ortho Biotech); (Rx)

EPRINOMECTIN

(e-pri-no-***mek***-tin) Ivomec® Eprinex®

TOPICAL AVERMECTIN ANTIPARASITIC AGENT

Prescriber Highlights
- Topically applied avermectin antiparasiticide for cattle
- Used as labeled; there are no milk or meat withdrawal times required

Uses/Indications
In cattle, eprinomectin is indicated for a variety gastrointestinal roundworms including adult and L4 stages of *Haemonchus placei, Ostertagia ostertagi, Trichostrongylus axei* and *colubriformis, Cooperia oncophora/punctata/surnabada, Nematodirus helvetianus, Oesophagostomum radiatum, Bunostomum phlebotomum*, and *Trichuris* spp. (adults only); cattle grubs; lice; mange mites; horn flies (for 7 days after treatment), and lungworms (*Dictyocaulus vivaparus*—for 21 days after treatment).

Topical eprinomectin may be useful for the topical treatment of ear mites (*Psoroptes cuniculi*) in rabbits. One small study (6 subjects) showed partial response when rabbits were dosed at 5 mg/kg topically, twice at 14 day intervals. (Ulutas, Voyvoda et al. 2005)

Pharmacology/Actions
Eprinomectin binds selectively to glutamate-gated chloride ion channels that occur in invertebrate nerve and muscle cells. This leads to an increase in cell membrane permeability to chloride ions, leading to paralysis and death of the parasite. Like ivermectin, eprinomectin enhances the release of gamma amino butyric acid (GABA) at presynaptic neurons. GABA acts as an inhibitory neurotransmitter and blocks the post-synaptic stimulation of the adjacent neuron in nematodes or the muscle fiber in arthropods. These compounds are generally not toxic to mammals as they do not have glutamate-gated chloride channels and do not readily cross the blood-brain barrier.

Pharmacokinetics
No information noted.

Contraindications/Precautions/Warnings
Do not give orally or intravenously.

Adverse Effects
At the time of review, no adverse reactions have been reported.

Overdosage/Acute Toxicity
Calves given up to 5X dosage showed no signs of adverse effects. One subject (of 6) showed signs of mydriasis when given a 10X dose.

Drug Interactions
No interactions noted

Doses
- **CATTLE:**

  For labeled indications:

  a) 1 mL per 10 kg (22 lb) body weight applied topically along backline in a narrow strip from the withers to the tailhead (Package Insert; *Ivomec® Eprinex®*—Merial)

Client Information
- When used as labeled, there are no milk or meat withdrawal times required.
- Weather conditions (including rainfall) during administration do not affect efficacy.
- Do not apply to backline if covered with mud or manure.
- Dispose of containers in an approved landfill or by incineration; do not contaminate water as eprinomectin may adversely affect fish and aquatic organisms.

Chemistry/Synonyms
A member of the avermectin-class of antiparasitic agents, eprinomectin is also known as MK-397 or 4-epi-acetylamino-4-deoxy-avermectin B1.

Storage/Stability
The commercially available product should be stored protected from light and kept at 86°F (30°C) or less. Storage up to 104°F (40°C) is permitted for a short period.

Dosage Forms/Regulatory Status
VETERINARY-LABELED PRODUCTS:

Eprinomectin Topical (Pour-On) Solution: 5 mg/mL in 250 mL/8.5 fl oz and 1 L/33.8 fl oz bottle with a squeeze-measure-pour-system, or a 2.5 L/84.5 fl oz and 5 L/169 fl oz collapsible pack for use with appropriate automatic dosing equipment; *Ivomec*® *Eprinex*® (Merial); (OTC). Approved for use in beef or dairy cattle.

HUMAN-LABELED PRODUCTS: None

Epsom Salts — see Magnesium Sulfate

EPSIPRANTEL

(ep-si-***pran***-tel) Cestex®

CESTOCIDAL ANTIPARASITIC AGENT

Prescriber Highlights
- Oral cestocide for dogs & cats
- Not appreciably absorbed when given orally
- Not approved in puppies or kittens less than 7 weeks old
- Adverse Effects: GI (vomiting, diarrhea) possible

Uses/Indications
Epsiprantel is indicated for the treatment (removal) of *Dipylidium caninum* and *Taenia pisiformis* in dogs, and *Dipylidium caninum* and *Taenia taeniaeformis* in cats.

Pharmacology/Actions
Epsiprantel's exact mechanism of action against cestodes has not been determined. The tapeworm's ability to regulate calcium is apparently affected, causing tetany and disruption of attachment to the host. Alteration to the integument makes the worm vulnerable to digestion by the host animal.

Pharmacokinetics
Unlike praziquantel, epsiprantel is absorbed very poorly after oral administration and the bulk of the drug is eliminated in the feces. Less than 0.1% of the drug is recovered in the urine after dosing. No metabolites have thus far been detected.

Contraindications/Precautions/Warnings
There are no labeled contraindications to this drug, but the manufacturer states not to use it in puppies or kittens less than 7 weeks of age.

Adverse Effects
Adverse effects would be unexpected with this agent, although vomiting and/or diarrhea could potentially occur.

Reproductive/Nursing Safety
Safety for use in pregnant or breeding animals has not been determined, but teratogenic effects would be highly unlikely since the drug is so poorly absorbed.

Overdosage/Acute Toxicity
Acute toxicity resulting from an inadvertent overdose is highly unlikely. Doses as high as 36X the recommended dose resulted in vomiting in some of the kittens tested. Single doses of 36X those recommended in dogs caused no adverse effects.

Drug Interactions/Laboratory Considerations
None reported; theoretically, prokinetic agents or fast acting laxatives may reduce the drug's efficacy

Doses
- **DOGS:**
  a) 5.5 mg/kg (2.5 mg/lb) PO once; round up to the next larger tablet size (Package insert; *Cestex*®—Pfizer)
- **CATS:**
  a) 2.75 mg/kg PO once. Cats up to 10 lb. should receive one 12.5 mg tablet; cats 11–20 lb. should receive one 25 mg tablet (Package insert; *Cestex*®—Pfizer)

Monitoring
- Clinical efficacy

Client Information
- Fasting is not required nor is it recommended before dosing
- Because the worm may be partially or completely digested, worm fragments may not be seen in the feces after treatment.
- A single dose is usually effective, but measures should be taken to prevent reinfection, particularly against D. caninum.

Chemistry/Synonyms
A pyrazino-benzazepine oral cesticide, epsiprantel occurs as a white powder that is sparingly soluble in water.

Epsiprantel may also be known as BRL-38705 or *Cestex*®.

Storage/Stability
Tablets should be stored at room temperature.

Dosage Forms/Regulatory Status
VETERINARY-LABELED PRODUCTS:

Epsiprantel Oral Tablets (Film-coated): 12.5, 25, 50 & 100 mg; *Cestex*® (Pfizer); (Rx). Approved for use in dogs and cats.

HUMAN-APPROVED PRODUCTS: None

ERGOCALCIFEROL

(er-goh-kal-***sif***-er-ole) Vitamin D2, Calciferol, Drisdol®

VITAMIN D ANALOG

Prescriber Highlights
- May be used to treat hypocalcemia associated with hypoparathyroidism, but DHT or calcitriol usually recommended first
- Less expensive than DHT or calcitriol, but takes large initial doses for effect, effects take longer to be seen, & if hypercalcemia develops, takes longer (up to 18 weeks) for toxicity relief