■ **CATS:**

For presumptive diagnosis of myasthenia gravis (MG):

a) 0.1 mg/kg IV, preceded by atropine to block muscarinic effects. Improvement should occur within one minute and persist for up to 15 minutes. (Kornegay 2003b)

b) 0.25–0.5 mg per cat IV (Joseph, Carrillo et al. 1988), (Kline 2001)

c) 0.25–0.5 mg (total dose) per cat IV; have atropine and endotracheal tube readily available in case of overdose. (Abramson 2005)

d) Pre-treat with atropine (0.02–0.04 mg/kg IM or SC); then give edrophonium at 0.1 mg/kg IV. In affected animals, paresis should resolve within one minute and effects should last for up to 15 minutes. (Korenegay 2006)

Monitoring

■ Cholinergic adverse effects

■ Improvement (for 1–15 minutes) of paresis for presumptive diagnosis of MG

Client Information

■ Edrophonium is a drug that should be used in a controlled clinical setting

■ Clients should be briefed on the side effects that can occur with its use

Chemistry/Synonyms

A synthetic quanternary ammonium cholinergic (parasympathomimetic) agent, edrophonium chloride occurs as a white crystalline powder having a bitter taste. Approximately 2 grams are soluble in 1 mL of water. The injection has a pH of approximately 5.4.

Edrophonium chloride may also be known as: edrophonii chloridum, *Anticude*®, *Camsilon*®, *Enlon*®, *Reversol*®, or *Tensilon*®.

Storage/Stability/Compatibility

Edrophonium chloride injection should be stored at room temperature.

It is reportedly physically **compatible** at Y-site injections with heparin sodium, hydrocortisone sodium succinate, potassium chloride and vitamin B complex with C. 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:

Edrophonium Chloride for Injection: 10 mg/mL in 1 mL amps & 10 mL & 15 mL vials; *Enlon*® (Ohmeda); *Reversol*® (Organon); *Tensilon*® (ICN); (Rx)

Edrophonium Chloride/Atropine Sulfate for Injection: 10 mg/mL with 0.14 mg/mL atropine sulfate in 5 mL amps and 15 mL multidose vials; *Enlon-Plus*® (Ohmeda); (Rx)

EFA-Caps® **— see Fatty Acids**

EMODEPSIDE + PRAZIQUANTEL

(ee-moe-***dep***-side + pra-zi-***kwon***-tel) Profender

TOPICAL ANTIPARASITIC (NEMATOCIDE; CESTOCIDE

Prescriber Highlights

- Topical cestocide & nematocide labeled for cats
- Appears safe in cats >1 kg & at least 8 weeks old
- Applied to back of cat's neck; do not allow patient or other cats to lick area of application for at least one hour

Uses/Indications

Emodepside/Praziquantel topical solution (*Profender*®) is indicated for the treatment and control of hookworm infections caused by *Ancylostoma tubaeforme* (adults, immature adults, and fourth stage larvae), roundworm infections caused by *Toxocara cati* (adults and fourth stage larvae), and tapeworm infections caused by *Dipylidium caninum* (adults) and *Taenia taeniaeformis* (adults) in cats.

Pharmacology/Actions

Emodepside has a unique mode of action in comparison to other antiparasitic compounds. The drug attaches pre-synaptically at the neuromuscular junction to a latrophilin-like receptor, resulting in an increase in intracellular calcium and diacylglycerol levels. At the end of the signal transduction cascade, vesicles containing inhibitory neuropeptide fuse with pre-synaptic membranes. Inhibitory neuropeptides such as PF1- and/or PF2-like receptor are then released into the synaptic cleft, stimulating postsynaptic receptors and resulting in an inhibition of pharyngeal pumping and locomotion of the nematode. The end result is flaccid paralysis and death of the parasite.

Praziquantel's exact mechanism of action against cestodes has not been determined, but it may be the result of interacting with phospholipids in the integument causing ion fluxes of sodium, potassium and calcium. At low concentrations *in vitro*, the drug appears to impair the function of their suckers and stimulates the worm's motility. At higher concentrations *in vitro*, praziquantel increases the contraction (irreversibly at very high concentrations) of the worm's strobilla (chain of proglottids). In addition, praziquantel causes irreversible focal vacuolization with subsequent cestodal disintegration at specific sites of the cestodal integument.

Pharmacokinetics

Following dermal application of the product (*Profender*®) to cats, emodepside and praziquantel are absorbed through the skin and into the systemic circulation. Absorption of both active ingredients through the skin is relatively rapid, with serum concentrations detectable within 2 hours for emodepside and within 1 hour for praziquantel. Peak concentrations occur within 6 hours for praziquantel and 2 days for emodepside. After a single application, both emodepside and praziquantel were detectable for up to 28 days following treatment were noted.

Contraindications/Precautions/Warnings

There are no absolute contraindications for use of this product on cats noted on the label. However, safe use has not been evaluated in cats: less than 8 weeks of age or weighing less than 2.2 lb (1 kg), used for breeding, during pregnancy, or in lactating queens. Use with caution in sick or debilitated, or heartworm positive cats.

Adverse Effects
In pre-approval efficacy studies, the most common side effects observed were dermal- and gastrointestinal-related. In a field study, adverse reactions reported by cat owners included licking/excessive grooming (3%), scratching treatment site (2.5%), salivation (1.7%), lethargy (1.7%), alopecia (1.3%), agitation/nervousness (1.2%), vomiting (1%), diarrhea (0.5%), eye irritation in 3 cats (0.5%), respiratory irritation (0.2%) and shaking/tremors (0.2%). All adverse reactions were self-limiting. The following adverse events were reported voluntarily during post-approval use of the product in foreign markets: application site reaction (hair loss, dermatitis, pyoderma, edema, and erythema), salivation, pruritus, lethargy, vomiting, diarrhea, dehydration, ataxia, loss of appetite, facial swelling, rear leg paralysis, seizures, hyperesthesia, twitching, and death.

Reproductive/Nursing Safety
Safe use has not been evaluated in cats used for breeding, during pregnancy, or in lactating queens. Studies performed in laboratory animals (rats, rabbits suggest that emodepside may interfere with fetal development in those species.

Overdosage/Acute Toxicity
Oral doses of emodepside of 200 mg/kg were tolerated by rats without mortalities. The oral LD50 in rats is >500 mg/kg; in mice >2,500 mg/kg. The acute dermal toxicity dose of emodepside in rats is high; a dose of 2,000 mg/kg was tolerated without mortality.

Praziquantel has a wide margin of safety. In rats and mice, the oral LD_{50} is at least 2 g/kg. An oral LD_{50} could not be determined in dogs, as at doses greater than 200 mg/kg, the drug induced vomiting. Parenteral doses of 50–100 mg/kg in cats caused transient ataxia and depression. Injected doses at 200 mg/kg were lethal in cats.

Kittens approximately 8 weeks of age were treated topically with the combination product up to 5X at 2 week intervals for treatments. Clinical signs of transient salivation and/or tremors were seen in a few animals in the 5X group, all of which were self-limiting.

Seven- to eight-month-old cats treated topically with the topical solution at 10X developed transient salivation, tremor, and lethargy.

Studies where the product was administered orally in cats have caused salivation, vomiting, anorexia, tremors, abnormal respirations, and ataxia. Adverse effects in all animals treated in these studies resolved without treatment.

Drug Interactions
No drug interactions have been documented for this product, but emodepside is reportedly a substrate for P-glycoprotein. Use with other drugs that are P-glycoprotein substrates or inhibitors (*e.g.*, **ivermectin, erythromycin, prednisolone, cyclosporine**) could cause pharmacokinetic drug interactions.

Doses
- **CATS:**

For labeled indications:

a) Minimum dose is 3 mg/kg emodepside & 12 mg/kg praziquantel applied to the skin on the back of the neck as a single topical dose. A second treatment should not be necessary. If re-infection occurs, the product can be re-applied after 30 days. (Label information; *Profender*®—Bayer)

Monitoring
- Clinical efficacy

Client Information
- Do not apply to broken skin or if hair coat is wet.
- Do not get in the cat's mouth or eyes or allow the cat to lick the application site for one hour. Oral exposure can cause salivation and vomiting; treatment at the base of the head will minimize the opportunity for ingestion while grooming.
- In households with multiple pets, keep animals separated to prevent licking of the application site.
- Not for human use. Keep out of reach of children. To prevent accidental ingestion of the product, children should not come in contact with the application site for 24 hours while the product is being absorbed. Pregnant women, or women who may become pregnant, should avoid direct contact with, or wear disposable gloves when applying, this product.

Chemistry/Synonyms
Emodepside is an N-methylated 24-membered cyclooctadepsipeptide, consisting of four alternating residues of N-methyl-L-leucine, two residues of D-lactate, and two residues of D-phenylacetate.

Praziquantel occurs as a white to practically white, hygroscopic, bitter tasting, crystalline powder, either odorless or having a faint odor. It is very slightly soluble in water and freely soluble in alcohol.

Praziquantel may also be known as: EMBAY-8440, or praziquantelum.

Storage/Stability
Store product at or below 25°C (77°F); do not allow to freeze.

Dosage Forms/Regulatory Status
VETERINARY-LABELED PRODUCTS:

Emodepside (1.98% w/w; 21.4 mg/mL) and Praziquantel (7.94% w/w; 85.8 mg/mL) Topical Solution in 0.35 mL (cats 2.2–5.5 lb.), 0.7 mL (cats >5.5–11 lb.) & 1.12 mL (cats >11–17.6 lb.) tubes: *Profender*® (Bayer); (Rx) Approved for use on cats.

HUMAN-LABELED PRODUCTS: None

ENALAPRIL MALEATE
ENALAPRILAT

(e-***nal***-a-pril) Enacard®, Vasotec®

ANGIOTENSIN-CONVERTING ENZYME (ACE) INHIBITOR

Prescriber Highlights
- **Veterinary & human ACE inhibitor used primarily as a vasodilator in the treatment of heart failure or hypertension; may also be of benefit in the treatment of chronic renal failure or protein losing nephropathies**
- **Contraindications: hypersensitivity to ACE inhibitors**
- **Caution: pregnancy, renal insufficiency (doses may need to be reduced), patients with hyponatremia, coronary or cerebrovascular insufficiency, preexisting hematologic abnormalities or a collagen vascular disease (e.g., SLE)**
- **Adverse Effects: GI distress (anorexia, vomiting, diarrhea); Potentially: weakness, hypotension, renal dysfunction & hyperkalemia**