

# Summary of Product Characteristics

## 1 NAME OF THE VETERINARY MEDICINAL PRODUCT

Virbakor 5 mg film-coated tablet for dogs and cats.

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each divisible tablet contains:

Benazepril Hydrochloride	5	mg
--------------------------	---	----

(equivalent to Benazepril 4.6 mg)

Excipients:

Titanium Dioxide (E171)	1.929	mg
Iron Oxide Yellow (E172)	0.117	mg
Iron Oxide Red (E172)	0.014	mg
Iron Oxide Black (E172)	0.004	mg

For the full list of excipients, see section 6.1

## 3 PHARMACEUTICAL FORM

Film-coated tablets.  
Beige oblong biconvex film-coated divisible tablets.

## 4 CLINICAL PARTICULARS

### 4.1 Target Species

Dogs and cats.

### 4.2 Indications for use, specifying the target species

Dogs:  
Treatment of congestive heart failure.

Cats:  
Reduction of proteinuria associated with chronic kidney disease.

### 4.3 Contraindications

Do not use in case of hypersensitivity to the active substance or to any of the excipients.  
Do not use in cases of hypotension, hypovolaemia, hyponatraemia or acute renal failure.  
Do not use in cases of cardiac output failure due to aortic or pulmonary stenosis.  
Do not use during pregnancy or lactation (section 4.7).

### 4.4 Special warnings for each target species

None.

## 4.5 Special precautions for use

### Special precautions for use in animals

No evidence of renal toxicity of the veterinary medicinal product has been observed in dogs or cats during clinical trials, however, as is routine in cases of chronic kidney disease, it is recommended to monitor plasma creatinine, urea and erythrocyte counts during therapy.

The efficacy and safety of the veterinary medicinal product has not been established in dogs and cats below 2.5 kg body weight.

### Special precautions to be taken by the person administering the veterinary medicinal product to animals

Pregnant women should take special care to avoid accidental oral exposure because angiotensin converting enzyme (ACE) inhibitors have been found to affect the unborn child during pregnancy in humans.

Wash hands after use.

In case of accidental oral ingestion, seek medical advice immediately and show the label or the package leaflet to the physician.

## 4.6 Adverse reactions (frequency and seriousness)

In double-blind clinical trials in dogs with congestive heart failure, the incidence of adverse reactions in treated dogs was lower than that observed in placebo-treated dogs.

A small number of dogs may exhibit transient vomiting, in coordination or signs of fatigue.

In cats and dogs with chronic kidney disease, the product may increase plasma creatinine concentrations at the start of therapy. A moderate increase in plasma creatinine concentrations following administration of ACE inhibitors is compatible with the reduction in glomerular hypertension induced by these agents, and is therefore not necessarily a reason to stop therapy in the absence of other signs.

The product may increase food consumption and body weight in cats.

Emesis, anorexia, dehydration, lethargy and diarrhoea have been reported in rare occasions in cats.

## 4.7 Use during pregnancy, lactation or lay

Do not use during pregnancy or lactation. The safety of the product has not been established in breeding, pregnant or lactating dogs and cats. Benazepril reduced ovary/oviduct weights in cats when administered daily at 10 mg/kg body weight for 52 weeks. Embryotoxic effects (foetal urinary tract malformation) were seen in trials with laboratory animals (rats) at maternally non-toxic doses.

## 4.8 Interaction with other medicinal products and other forms of interaction

In dogs with congestive heart failure, the product has been given in combination with digoxin, diuretics, pimobendan and anti-arrhythmic veterinary medicinal products without demonstrable adverse interactions.

In humans, the combination of ACE inhibitors and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) can lead to reduced anti-hypertensive efficacy or impaired renal function. The combination of the product and other anti-hypertensive agents (e.g. calcium channel blockers,  $\beta$ -blockers or diuretics), anaesthetics or sedatives may lead to additive hypotensive effects. Therefore, concurrent use of NSAIDs or other medications with a hypotensive effect should be considered with care. Renal function and signs of hypotension (lethargy, weakness etc) should be monitored closely and treated as necessary. Interactions with potassium preserving diuretics like spironolactone, triamterene or amiloride cannot be ruled out. It is recommended to monitor plasma potassium levels when using the product in combination with a potassium sparing diuretic because of the risk of hyperkalaemia.

4.9 Amounts to be administered and administration route

Oral use.

The product should be given orally once daily, with or without food. The duration of treatment is unlimited.

The product should be administered orally at a minimum dose of 0.25 mg benazepril hydrochloride/kg body weight once daily for dogs and at a minimum dose of 0.5 mg benazepril hydrochloride/kg body weight once daily for cats, according to the following table:

	Weight (kg)	Virbakor 5 mg film-Coated Tablets	
		Standard dose	Double dose
Dog	>5 – 10	0.5 tablet	1 tablet
Dog	>10 – 20	1 tablet	2 tablets
Cat	2.5 - 5	0.5 tablet	Not applicable
Cat	> 5 - 10	1 tablet	Not applicable

In dogs, the dose may be doubled, still administered once daily, to a minimum dose of 0.5 mg/kg, if judged clinically necessary and advised by the veterinary surgeon.

4.10 Overdose (symptoms, emergency procedures, antidotes), if necessary

The product reduced erythrocyte counts in healthy cats when dosed at 10 mg/kg body weight once daily for 12 months and in healthy dogs when dosed at 150 mg/kg body weight once daily for 12 months, but this effect was not observed at the recommended dose during clinical trials in cats or dogs.  
Transient reversible hypotension may occur in cases of accidental overdose. Therapy should consist of intravenous infusion of warm isotonic saline.

4.11 Withdrawal Period(s)

Not applicable.

5 PHARMACOLOGICAL or IMMUNOLOGICAL PROPERTIES

Pharmacotherapeutic group: ACE Inhibitors, plain.  
ATCvet code: QC09AA07

## 5.1 Pharmacodynamic properties

Benazepril hydrochloride is a prodrug hydrolysed *in vivo* to its active metabolite, benazeprilat.

Benazeprilat is a highly potent and selective inhibitor of ACE, thus preventing the conversion of inactive angiotensin I to active angiotensin II and thereby also reducing synthesis of aldosterone. Therefore, it blocks effects mediated by angiotensin II and aldosterone, including vasoconstriction of both arteries and veins, retention of sodium and water by the kidney and remodelling effects (including pathological cardiac hypertrophy and degenerative renal changes).

The product causes long-lasting inhibition of plasma ACE activity in dogs and cats, with more than 95% inhibition at peak effect and significant activity (>80% in dogs and >90% in cats) persisting 24 hours after dosing.

The product reduces the blood pressure and volume load on the heart in dogs with congestive heart failure.

In cats with experimental renal insufficiency, the product normalized the elevated glomerular capillary pressure and reduced the systemic blood pressure.

Reduction in glomerular hypertension may retard the progression of kidney disease by inhibition of further damage to the kidneys. Placebo controlled clinical field studies in cats with chronic kidney disease (CKD) have demonstrated that the product significantly reduced levels of urine protein and urine protein to creatinine ratio (UPC); this effect is probably mediated via reduced glomerular hypertension and beneficial effects on the glomerular basement membrane. No effect of the product on survival in cats with CKD has been shown, but the product increased the appetite of the cats, particularly in more advanced cases.

## 5.2 Pharmacokinetic properties

After oral administration of benazepril hydrochloride, peak levels of benazepril are attained rapidly ( $T_{\max}$  0.5 hour in dogs and within 2 hours in cats) and decline quickly as the active substance is partially metabolised by liver enzymes to benazeprilat. The systemic bioavailability is incomplete (~13% in dogs) due to incomplete absorption (38% in dogs, <30% in cats) and first pass metabolism.

In dogs, peak benazeprilat concentrations ( $C_{\max}$  of 40.9 ng/ml after a dose of 0.5 mg/kg benazepril hydrochloride) are achieved with a  $T_{\max}$  of 1.5 hours.

In cats, peak benazeprilat concentrations ( $C_{\max}$  of 198.7 ng/ml after a dose of 0.5 mg/kg benazepril hydrochloride) are achieved with a  $T_{\max}$  of 1 hours.

Benazeprilat concentrations decline biphasically: the initial fast phase ( $t_{1/2}$ =1.7 hours in dogs and  $t_{1/2}$ =2.4 hours in cats) represents elimination of free drug, while the terminal phase ( $t_{1/2}$ =12.4 hours in dogs and  $t_{1/2}$ =13.9 hours in cats) reflects the release of benazeprilat that was bound to ACE, mainly in the tissues. Benazepril and benazeprilat are extensively bound to plasma proteins (85-90%), and in tissues are found mainly in the liver and kidney.

There is no significant difference in the pharmacokinetics of benazeprilat when benazepril hydrochloride is administered to fed or fasted dogs. Repeated administration of the veterinary medicinal product leads to slight bioaccumulation of benazeprilat ( $R$ =1.47 in dogs and  $R$ =1.36 in cats with 0.5 mg/kg), steady state being achieved within a few days (4 days in dogs).

Benazeprilat is excreted 54% via the biliary and 46% via the urinary route in dogs and 85% via the biliary and 15% via the urinary route in cats. The clearance of benazeprilat is not affected in dogs or cats with impaired renal function and therefore no adjustment of the product dose is required in either species in cases of renal insufficiency.

## 6 PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

Iron oxide yellow (E-172)  
Iron oxide red (E-172)  
Iron oxide black (E-172)  
Titanium dioxide (E-171)  
Cellulose microcrystalline  
Lactose monohydrate  
Povidone  
Maize starch  
Silica colloidal anhydrous  
Magnesium stearate  
Hypromellose  
Macrogol 8000

### 6.2 Incompatibilities

Not applicable.

### 6.3 Shelf-life

Shelf life of the veterinary medicinal product as packaged for sale: 18 months  
Shelf life of halved tablet: 1 day.

### 6.4 Special precautions for storage

Do not store above 25°C. Store in a dry place.  
Return any halved tablet to the blister pack and use within 1 day.  
The blister pack should be inserted back into the cardboard box.

### 6.5 Nature and composition of immediate packaging

Blister made of clear film of PVC/PE/PVDC and aluminium film containing 14 tablets.  
Carton box with:  
- 1 blister (14 tablets)  
- 10 blisters (140 tablets)

Not all pack size may be marketed.

### 6.6 Special precautions for the disposal of unused veterinary medicinal products or waste materials

Any unused veterinary medicinal product or waste materials derived from such veterinary medicinal product should be disposed of in accordance with local requirements.

## 7 MARKETING AUTHORISATION HOLDER

Virbac  
1ère Avenue – 2065 m - LID  
06516 Carros  
France

**8 MARKETING AUTHORISATION NUMBER(S)**

VPA: 10988/093/001

**9 DATE OF THE FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION**

Date of first authorisation: 25th July 2014

**10 DATE OF REVISION OF THE TEXT**