The unique combination of benazepril and spironolactone
Heart failure causes activation of the RAAS System and the production of angiotensin II and aldosterone. Both angiotensin II and aldosterone have harmful effects which contribute to the vicious cycle of heart failure.
Aldosterone levels, however, can continue to rise in patients receiving an ACE Inhibitor. This is because other factors also stimulate aldosterone production\(^2\,3\,4\,5\,6\,7\). ACE Inhibitors, such as benazepril, prevent the synthesis of angiotensin II\(^2\).

Aldosterone levels, however, can continue to rise in patients receiving an ACE Inhibitor. This is because other factors also stimulate aldosterone production\(^2\,3\,4\,5\,6\,7\).

Spironolactone takes the place of aldosterone on its receptor and therefore blocks the harmful effects of aldosterone\(^3\,8\).

Combining an ACE Inhibitor and spironolactone is the best strategy to achieve comprehensive blockade of the RAAS System\(^2\,3\,8\).
The benefits of **ACE Inhibitors** have been clearly demonstrated in clinical trials:

- **Double-blind, placebo-controlled study looking at 125 dogs with heart failure caused by mitral valve disease**
- **49% reduction in the risk of mortality** when dogs received the leading ACE Inhibitor benazepril.

However, despite these benefits:

- **Aldosterone levels can continue to rise in heart failure patients receiving an ACE Inhibitor**
- **In studies on healthy dogs, furosemide was shown to cause a three fold increase in aldosterone, an effect which was not inhibited by either an ACE Inhibitor or pimobendan**
The efficacy of the aldosterone antagonist **spironolactone** is well established in veterinary cardiology:

- Double-blind placebo-controlled study looking at 212 dogs with heart failure caused by mitral valve disease
- **69% reduction in the risk of mortality** when dogs received spironolactone in addition to an ACE Inhibitor

Furthermore, when looking specifically at dogs receiving spironolactone and benazepril (compared with benazepril alone):

- **89% reduction in the risk of mortality**

**Quality of life benefits:**

- **Quicker improvement in cough and activity levels**
- **Slower deterioration of cough, heart sounds and appetite**

The combination of benazepril and spironolactone has been shown to improve quality of life and prolong survival for dogs with heart failure.

* For the treatment of congestive heart failure caused by chronic degenerative valvular disease in dogs (with diuretic support as appropriate)
Cardalis®: the unique combination of benazepril and spironolactone

Two active ingredients combined at their standard dosage
- Benazepril: 0.25mg/kg
- Spironolactone: 2mg/kg

Easy to give
- Small, beef flavoured tablets
- Once daily administration with food

Easy to prescribe
- Three tablet sizes
- 30 tablets per pot

Cardalis Small
- 2.5mg Benazepril
- 20mg Spironolactone

Cardalis Medium
- 5mg Benazepril
- 40mg Spironolactone

Cardalis Large
- 10mg Benazepril
- 80mg Spironolactone

Dog bodyweight (kg) | Cardalis Small | Cardalis Medium | Cardalis Large
--- | --- | --- | ---
2.5 - 5 | 1/2 | | |
5 - 10 | 1 | | |
10 - 20 | 1 | 1 | |
20 - 40 | | 1 | |
40 - 60 | | | 1 + 1/2 |
60 - 80 | | | 2 |

Cardalis® should be given instead of your usual ACE Inhibitor*. 

* For the treatment of congestive heart failure caused by chronic degenerative valvular disease in dogs (with diuretic support as appropriate)
Heart failure is a chronic condition requiring polytherapy; compliance is therefore a key issue for vets and pet owners.

The preference for Cardalis® has been assessed in a field study involving 101 dogs who were prescribed:
- Cardalis® for 3 months, followed by separate benazepril and spironolactone tablets for 2 weeks
- Furosemide and pimobendan were also authorised from inclusion

**Dog owner preference**

- Ease of administration: 97% Cardalis, 3% 2 separate tablets
- Palatability: 90% Cardalis, 10% 2 separate tablets
- Easier to prescribe: 89% Cardalis, 11% 2 separate tablets

**Compliance**

86.5% fully complied with 3 months Cardalis® treatment regime

This dropped by 14% within 2 weeks of using the two separate actives

Cardalis® makes it easier for you to prescribe and your patients to benefit from benazepril and spironolactone as part of first-line heart failure therapy*.

* For the treatment of congestive heart failure caused by chronic degenerative valvular disease in dogs (with diuretic support as appropriate)
“Based on evidence-based medicine, there is justification for the use of all three categories of heart failure medications – ACE Inhibitors, pimobendan and spironolactone – alongside furosemide”

Mike Martin MVB DVC MRCVS
RCVS Cardiology Specialist

“For dogs with chronic heart failure caused by mitral valve disease requiring home-care, my approach is to use furosemide, ACE Inhibitor, pimobendan as well as spironolactone”

Professor Clarke Atkins MDVM
ACVIM Cardiology Specialist

To find out more from leading experts about the management of heart failure in practice, visit the following free CPD website:

www.cardioacademy.cevalearn.com
1st international e-learning programme in cardiology

Each module lasts around 20-30 minutes. CPD certificates are then available upon completion. The website is updated on a regular basis and currently includes the following sessions:

| Pathophysiology of mitral valve disease Cardiac biomarkers | Adrian Boswood |
| Clinical examination of the cardiac dog Compliance – a long term challenge | Gérard Le Bobinnec |
| Thoracic X-rays – how to proceed, normal features and abnormal features | Nicole Van Israël |
| Echocardiography – common views, mitral valve disease and and DCM | Anne French |
| Cardiac drugs – mechanism of action Management of mitral valve disease and DCM | Clarke Atkins |
| Cardiology Case Study | Jordi Lopez-Alvarez |
Cardalis® has been assessed on the field in a 15 week study involving 101 dogs (furosemide and pimobendan were also authorised from inclusion)¹. The dogs treated with this combination showed a quick clinical improvement from the first week and the study confirmed that Cardalis® was well tolerated when combined with:

**Pimobendan**¹²

**Furosemide**
- Activates RAAS System²,³,⁴,⁵,⁶,⁷

Clinical studies have also demonstrated:

- Comparable potassium levels for dogs receiving benazepril and spironolactone and those receiving benazepril alone⁹,¹⁰*
- No clinically significant effects when administered to healthy dogs at up to 10 times the recommended dose¹⁰,¹³

Cardalis® has a good safety profile*  

* For the treatment of congestive heart failure caused by chronic degenerative valvular disease in dogs (with diuretic support as appropriate). See datasheet on the back page for a full list of precautions. An increased incidence of hyperkalaemia was not observed in clinical trials performed in dogs with this combination. However, regular monitoring of renal function and serum potassium levels is recommended in dogs with renal impairment, as they may have an increased risk of hyperkalaemia. This should also be evaluated before initiating treatment, especially in dogs which may suffer hypoadrenocorticism, hyperkalaemia or hyponatraemia.
At what stage of heart failure should Cardalis® be used?

Cardalis® should be given as part of your standard heart failure therapy as soon as clinical signs (such as exercise intolerance, coughing and/or dyspnoea) appear.*

Why should Cardalis® be administered with food?

Spiranolactone is fat soluble and its absorption is improved by bile, which is produced following feeding. It has been shown that the absorption of spiranolactone is 80-90% when administered with food versus 32-49% when given without food.

Can Cardalis® be used alongside pimobendan?

Yes, it has been shown that Cardalis® is well tolerated when combined with pimobendan.12

Do I need to reduce the furosemide dose when using Cardalis®?

No, the dose of furosemide that you need to control oedema will usually remain the same. The diuretic effect of spiranolactone is very mild and the main reason for using Cardalis® is to counteract the harmful effects of angiotensin II and aldosterone, which include vasoconstriction and cardiovascular re-modelling/ fibrosis.*

***

For the home-care treatment of congestive heart failure caused by chronic degenerative valvular disease in dogs (with diuretic support as appropriate)

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Published by Ceva Animal Health

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