Canine angiostrongylosis

**Angiostrongylus vasorum**
- Canine angiostrongylosis is a parasitic disease caused by *Angiostrongylus vasorum* (‘French heartworm’ or ‘canine lungworm’), a metastrongylid nematode.
- The fox is a natural reservoir of the parasite. Other wild canids, e.g. wolves and jackals, can act as definitive hosts.
- Adult worms live in the pulmonary arteries and right side of the heart of dogs.
- Worm eggs hatch in the pulmonary capillaries and L1 pass through the alveolar walls. These larvae get coughed up and are swallowed. They can be found in the faeces.
- Slugs and snails are the intermediate hosts.
- Young dogs and dogs with indiscriminate feeding behaviour are predisposed to infection.
- The prepatent period is 6-7 weeks.

When to suspect infection?
- **Clinical signs**
  - Cough, dyspnoea, exercise intolerance
  - Clinical signs of coagulopathy: subcutaneous haematoma, melena, epistaxis, haemoptysis, anaemia
  - Neurological signs, e.g. paresis, seizures, ataxia
- **Clinical pathology**
  - Most haematological and biochemical parameters are within the normal range
  - Thrombocytopenia
  - Eosinophilia
  - Hypochromic anaemia
  - Altered coagulation profile
  - Unexplained positive *D. immitis* antigen test (cross reactivity)
- **Diagnostic imaging**
  - Thoracic radiography: Interstitial or mixed lung pattern
  - Ultrasonography: Sub-pleural nodules in the lungs.
- **Origin / travelling history**
  - Dogs that live in, originate from or have travelled to countries where the parasite is endemic are at risk.

How can it be confirmed?
- **Baermann test** (L1 in the faeces): good specificity and sensitivity (if performed on fresh, uncontaminated faeces).
  - Time-consuming. The determination of *Angiostrongylus* larvae depends on operator expertise. Repeating the test with at least three different faecal samples will increase the sensitivity of the test. See overleaf for the Baermann test technique.
- **In-clinic antigen test** (*AngioDetect®, Idexx*): Serological detection of circulating antigens of *A. vasorum* worms. Highly specific, good sensitivity of clinically suspect dogs and easy to use.
  - For optimal sensitivity, both tests should be used.

Disease management
- **Imidacloprid 10%/moxidectin 2.5%** (spot-on)
- **Milbemycine oxime, 0.5 mg/kg, oral route, once a week for 4 weeks** (reduction of parasitic burden)
- **Fenbendazole, 25-50 mg/kg PO once daily for 20 days.**
- **Dogs should be rechecked by the Baermann test or serologically for antigen detection after 3-4 weeks.**

Produced by the FECAVA working group on canine vector-borne diseases in collaboration with ESCAP and ESDA
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**Drugs and dosages for the treatment of canine angiostrongylosis:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage regimen</th>
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<tbody>
<tr>
<td>Imidacloprid 10% / moxidectin 2.5%</td>
<td>Spot on, two doses at a 28-day interval</td>
</tr>
<tr>
<td>Fenbendazole</td>
<td>25-50 mg/kg PO q24h for 20 days</td>
</tr>
<tr>
<td>Milbemycin oxime</td>
<td>0.5 mg/kg PO once a week for 4 weeks</td>
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**Prevention**
- In hyperendemic areas and endemic areas where dogs are at increased risk due to their lifestyle: year-round monthly administration of imidacloprid/moxidectin or milbemycin (dosage as for treatment) or regular parasitologic controls.
- Ingestion of snails and slugs should be prevented whenever possible.

**Travel advice**
- Dogs travelling to highly endemic areas and belonging to risk groups (indiscriminate feeding behaviour, young age) may require preventive monthly treatment.

**The Baermann technique**
- Equipment: funnel (on an appropriate stand) with rubber or plastic tube with a clamp
- Procedure:
  - Use 5-10 g of fresh faeces, not contaminated with soil or grass.
  - Place it on a double layer of gauze, large enough to wrap the gauze around the sample to make a pouch.
  - Suspend the gauze with faeces on a glass stick or wooden tongue depressor using a clamp or rubber band.
  - Place the sample in the funnel.
  - Fill the funnel with lukewarm water, covering the faecal material.
  - Allow the sample to sit overnight (at least 12 hours).
  - Release the clamp of the funnel and collect the first 10 ml of the fluid into a centrifuge tube.
  - Centrifuge the collected fluid for 3 minutes (1500 rpm).
  - Discard the supernatant and place a few drops of the sediment on a glass slide; examine with 4x or 10x objective lens.
- If moving larvae are spotted, add two drops of Lugol solution (which will kill and stain larvae) and add a cover glass; examine larval morphology with 10x and 40x magnification.

**Characteristics of the A. vasorum larva (L1)**

- **Thoracic X-ray:** abnormal pulmonary pattern.
- Ultrasound of the lung of a dog with angiostrongylosis: subpleural hypoechoic nodule.

**To download the FECAVA fact sheets on canine vector-borne diseases, please visit our website: www.fecava.org ©September 2018.**