

## New treatments for manges in dogs?



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## Canine demodicosis

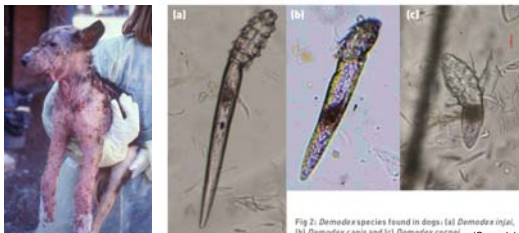


Fig 2. Demodex species found in dogs. (a) *Demodex injai*, (b) *Demodex canis* and (c) *Demodex cornei*. (Cerundolo 2017)

- Most common = *D. canis*
- No difference in treatment recommendations for the three types of mite

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## Canine demodicosis



Current approved drug in Canada:

- imidacloprid + moxidectin (**Advantage Multi®**)
  - "aid in treatment and control"
- administer monthly for 4 applications
- administer weekly if severe disease (European claim)
- stop treatment after 1 month of negative scrapings

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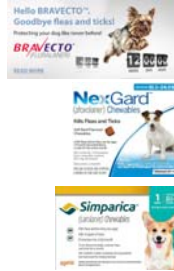
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## New treatments for demodicosis in dogs ?

### Isoxazolines:

- fluralaner (Bravecto®)
- afoxolaner (NexGard™)
- sarolaner (Simparica®)




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## fluralaner (Bravecto®)

- Two groups of 8 dogs with generalized **demodicosis**

**Group 1** – fluralaner (25 mg/kg) – **once**

**Group 2** – imidacloprid (10 mg/kg) /moxidectin (2.5 mg/kg)  
– 3 times at 28-day intervals



### Reduction in mite numbers in scrapings compared to day 0:

	Day 28	Day 56	Day 84
fluralaner	99.8%	100%*	100%*
imidacloprid/moxidectin	98.0%	96.5%*	94.7%*

\*. same symbol = significantly different

At 12 weeks after initial treatment: equally effective impact on (↓) skin lesions and (↑) hair regrowth

(Fourie et al 2015)

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## fluralaner (Bravecto®)

- On label in Argentina, Columbia, Mexico, New Zealand, Philippines, South Korea, Taiwan, Thailand and Vietnam - for treatment and control of dogs with **demodicosis**

- Most cases resolve after single treatment (label dosage)

- If second treatment, give 3 months later



(N. Colapinto, Nov 14, 2017)

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## afoxolaner (NexGard™)



- Two groups of 8 dogs with generalized **demodicosis**

**Group 1** – afoxolaner (≥2.5 mg/kg) – days 0, 14, 28, 56

**Group 2** – imidacloprid (10 mg/kg) /moxidectin (2.5 mg/kg) – days 0, 14, 28, 56



**Reduction in mite numbers in scrapings compared to day 0:**

	Day 28	Day 56	Day 84
afoxolaner	99.2%*	99.9%*	100%#
imidacloprid/moxidectin	89.8%*	85.2%*	86.6%#

\*.\*# same symbol = significantly different

**Days 28-84:** significantly improved skin condition in group treated with afoxolaner (Beugnet et al 2016)

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## afoxolaner (NexGard™)



- Not currently approved for treatment of **demodicosis** in dogs in any country

**Recommended (off label) treatment protocol:**

- Monthly treatment at 2.5-6.3 mg/kg (label dosage)
  - Majority of cases cleared within 2 months

(F. Rotondo, Nov 7, 2017)

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## sarolaner (Simparica®)



- Two groups of 8 dogs with generalized **demodicosis**

**Group 1** – sarolaner (2 mg/kg) – days 0, 30, 60

**Group 2** – imidacloprid (10 mg/kg) /moxidectin (2.5 mg/kg) – weekly from day 0 to day 81



**Reduction in mite numbers in scrapings compared to day 0:**

	Day 14	Day 29	Day 74
sarolaner	97.1%*	99.8%*	100%
imidacloprid/moxidectin	84.4%*	95.6%*	100%

\*.\* same symbol = significantly different

**All dogs in both groups:** marked clinical improvement (Six et al 2016)

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## sarolaner (Simparica®)

- On label in Australia and United Kingdom for treatment of dogs with **demodicosis**

**Recommended treatment protocol:**

- two treatments (2 mg/kg) one month apart

  
(M. Wamback, Nov 7, 2017)

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## sarcoptic mange




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## sarcoptic mange in dogs

**Current approved drugs in Canada:**

(a) **imidacloprid + moxidectin (Advantage Multi®)**

- administer monthly for 2 applications

(b) **selamectin (Revolution®)**

- for complete eradication 2 doses may be required


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## fluralaner (Bravecto®)

- On label in New Zealand and South Korea - for treatment and control of dogs with **sarcoptic mange**
- Most cases resolve after single treatment (label dosage)
  - If second treatment, give 3 months later



(N. Colapinto, Nov 14, 2017)

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## afoxolaner (NexGard™)



- Two groups of 10 dogs with **sarcoptic mange**

**Group 1** – no treatment

**Group 2** – afoxolaner (≥2.5 mg/kg) – days 0, 28

### Observations:

- Significantly lower mite counts in treated group on days 28 + 56 (no mites)
- Significantly better lesion resolution in treated group on day 56
  - No treated dog exhibited pruritus; 7/10 dogs in control group = pruritic (Beugnet et al 2016)
- Two treatments one month apart provide effective and safe treatment of sarcoptic mange in dogs (Hampel et al 2017 – poster)

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## sarolaner (Simparica®)



- 79 dogs with **sarcoptic mange**

**Group 1** – sarolaner (2 mg/kg) – days 0, 30

**Group 2** – imidacloprid (10 mg/kg) / moxidectin (2.5 mg/kg) – days 0, 30



### Parasitological cure rate:

	Day 30	Day 60
sarolaner (n = 53)	88.7%	100%
imidacloprid/moxidectin (n = 26)	84.6%	96.0%

**All dogs in both groups:** marked clinical improvement

(Becskei et al 2016)

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## sarolaner (Simparica®)

- On label in the United Kingdom for treatment of dogs with **sarcoptic mange**

**Recommended treatment protocol:**

- two treatments (2 mg/kg) one month apart



(M. Wamback, Nov 10, 2017)

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## Dogs from northern communities ?




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## Parasite #1 ?




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## *Diphyllobothrium latum*



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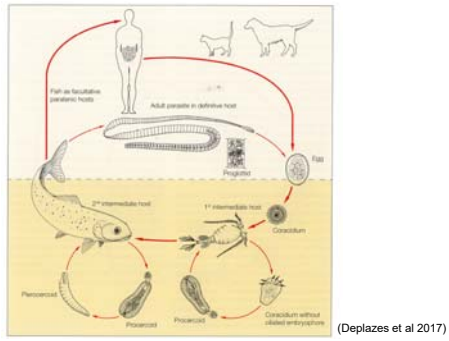
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## *Diphyllobothrium latum* – fish tapeworm



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## *Diphyllobothrium latum*

### Distribution:

- Alaska, Great Lakes region, northern Europe, Russia, parts of Asia and South America

### Hosts:

- Adult parasite in small intestine of dogs, cats, people, foxes, mink and other fish-eating animals
  - Fish most commonly infected = perch, pike, walleye

### Clinical signs:

- Infections in dogs and cats typically subclinical
  - Chains of segments commonly found in feces

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## D. latum - treatment

- Praziquantel dosage approved for *Taenia* spp. and *Dipylidium caninum* (5 mg/kg) often fails to eliminate *D. latum* infections in dogs/cats

### Recommended treatment:

Drug	Species	Dosage	Route
praziquantel	Dog	7.5 mg/kg*	PO
	Cat	35 mg/kg*	PO

\* Some authors recommend second treatment, 24 hours after the first

+ Same dosage can be used in dogs

(Sakamoto 1977; Kirkpatrick et al 1987; Bowman 2014; Peregrine unpub)

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## Echinococcus in Ontario?



- *Echinococcus granulosus* = northern Ontario
- *Echinococcus multilocularis* = southern Ontario

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## Echinococcus



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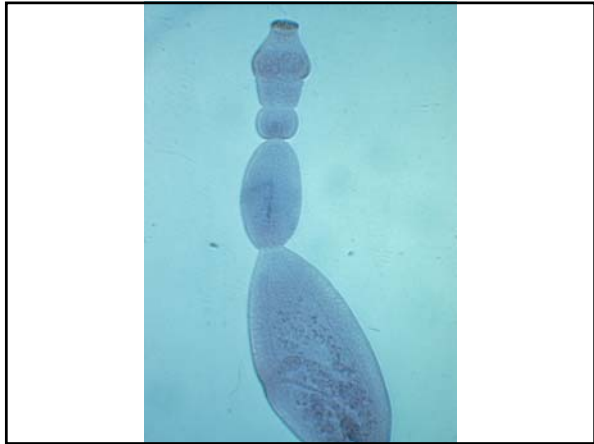
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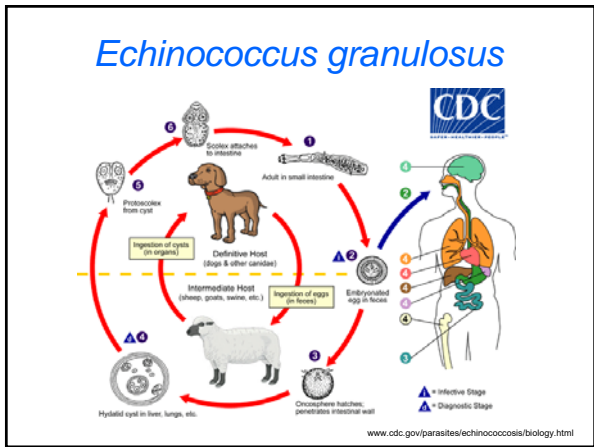
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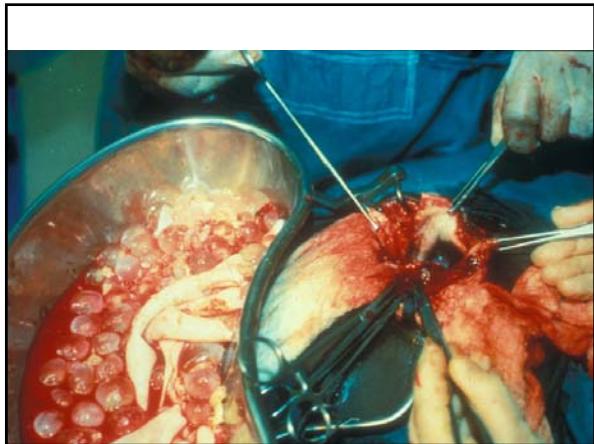
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## *Echinococcus granulosus* in Ontario



All cervids

Adult tapeworm



Hydatid cyst (liver, lungs)

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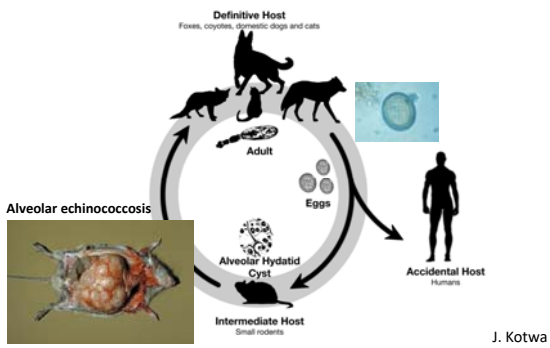
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## Life cycle of *Echinococcus multilocularis*




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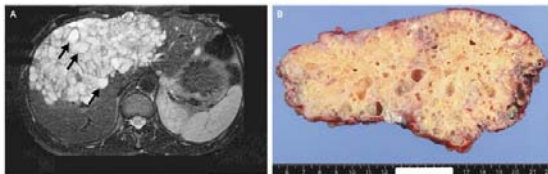
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## Human infections

- Parasite typically develops in liver:



(Halkic and Gillet. 2004. N Engl J Med 351,4)

- 44-year old woman, 10-month history of intermittent discomfort in upper right abdomen
- Incubation period usually 5-15 years

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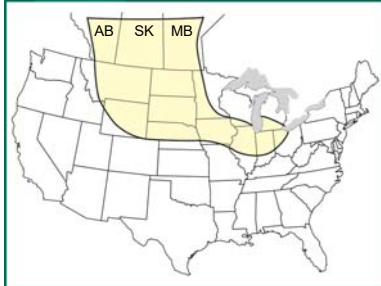
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## Approximate distribution of *E. multilocularis* in central North America



(Kazacos 2003)

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## Prevalence of *E. multilocularis* in coyotes and foxes (2015-2017)

- Overall, approximately 25% of wild canids (coyotes, foxes) in southern Ontario tested positive for *E. multilocularis*

(Kotwa, J. unpublished)

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## Treatment of *E. granulosus* and *E. multilocularis* in the intestine of dogs

### Label-approved treatment:

Drug	Dosage	Route
praziquantel	5.0 mg/kg	PO
	5.7 mg/kg	IM

Note: Not all products for dogs in Canada that contain praziquantel are approved for *Echinococcus* spp.

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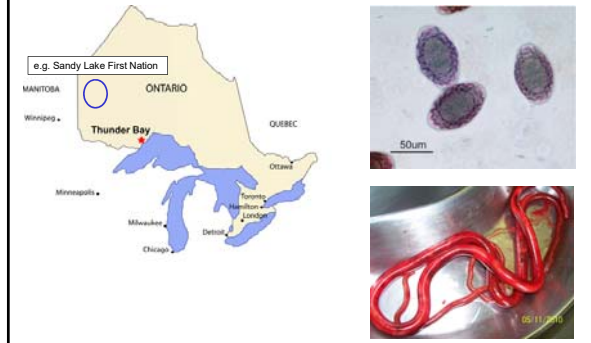
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## Diactophyme renale




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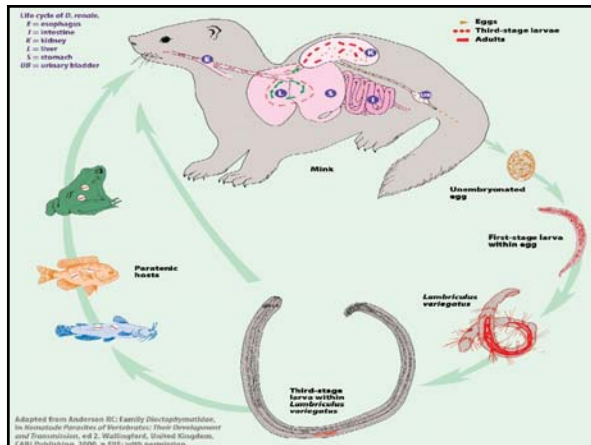
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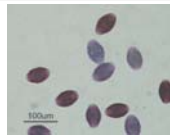
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## Screening for *D. renale* infections in dogs ?

- Recognise that:
  - Parasites may be in pelvis of right kidney or free in abdomen
  - Prepatent period = 6 months to 2 years
- Urinalysis ?
- Abdominal ultrasound ?




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## Management of dogs infected with *D. renale* ?

- Treatment ?
- Surgery ?
  - Nephrectomy ?
  - Exploratory laparotomy ?
- Do nothing ?



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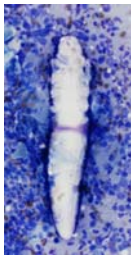
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## Questions ?



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