

Common Ectoparasites and Treatment Modalities in Dogs and Cats

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Learning Objectives

At the conclusion of this program, the participating pharmacist or technician will be able to:

- Describe treatment options available for ectoparasitic infections of dogs and cats.
- List two common ectoparasites of dogs and cats with potential to transmit zoonotic diseases.
- Counsel animal care givers regarding treatment protocols for ectoparasitic infections in dogs and cats.

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Common Ectoparasites and Treatment Modalities in Dogs and Cats

Common Ectoparasites to be reviewed

- Fleas
- Ticks
- Demodex Mange Mites
- Sarcoptic Mange Mite
- Otodectic Mite

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Ectoparasites - Fleas

Two common Species of fleas affecting dogs and cats include:

Ctenocephalides felis (cat flea)
Ctenocephalides canis (dog flea)

***Ctenocephalides felis* is the most common ectoparasite of dogs and cats in North America.¹**

Fleas are uncommon where relative humidity remains below 50% (desert southwest and Rocky Mountain states).¹

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Ectoparasites - Fleas

Life Stages of the Flea

- Eggs
- Larvae
- Pupae
- Adults

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Flea Associated Diseases

(*Ctenocephalides felis*)

Flea allergy dermatitis (FAD) is the most common veterinary dermatologic condition in the world.¹

- Related to bite of flea and flea saliva²

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Flea Associated Diseases

(*Ctenocephalides felis*)

Signs of Flea Allergy Dermatitis include:²

- Pruritis
 - Scratching, chewing, licking, biting
- Alopecia
- Skin Inflammation
- Secondary Infections

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Flea Associated Diseases¹

(*Ctenocephalides felis*)

- Iron deficiency anemia
 - In heavy infestations death, particularly in puppies and Kittens
- Tape Worms (*Dipylidium caninum*)
- Cat Scratch Disease (*Bartonella hensalae*)
- Murine Typhus (*Rickettsia typhi*)
- Flea-borne typhus (*Rickettsia felis*)
- *Dipetalonema* (*Dipetalonema reconditum*)

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Case 1

Gentle Ben

- Species – Canine
- Breed – German Shepard
- Gender – Male / Intact
- Age – 9 years
- Weight – 92 pounds
- Presented for scratching and inflamed skin
- Alerts : CAUTION

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Physical Exam

Gentle Ben

Temp 102.1
Heart rate 100
Respiration 45
CRT – unable to assess – dog muzzled
Body Score 3 out of 5

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Case 1 – Gentle Ben

Diagnosis – Flea Allergy Dermatitis

Plan:

Depo-Medrol (methylprednisolone acetate) 40 mg SC
Nexgard® (afoxolaner) 60-121# Dose Chew Tab

Rx:

Cephalexin 500mg
#60

Sig: Give 2 capsules orally every 8 hours until gone for skin infection.

Recheck in 2 weeks.

Comment: It is not uncommon for an owner not to observe fleas on an animal with flea allergy dermatitis.

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Ectoparasites - Fleas

Public Health Considerations

Zoonotic Agents Transmitted by *Ctenocephalides felis*¹

- Cat Scratch Disease (*Bartonella henselae*)
- Tapeworms (*Dipylidium caninum*)
- Murine typhus (*Rickettsia typhi*)
- Flea-borne typhus (*Rickettsia felis*)

Rodent fleas may be acquired by dogs and cats may be vectors for bubonic plague (*Y. pestis*)¹

Humans can be bitten by newly emerging fleas

- Potential allergic response

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Human VS Animal Treatment Information

Package Inserts

HUMANS = PDR ANIMALS = CVP

Product Status

HUMANS = FDA ANIMALS = FDA-CVM

**EPA
USDA**

Terminology

HUMANS = Off label ANIMALS = Extralabel

HUMANS = Signs & Symptoms ANIMALS = Signs

Prescription

HUMANS = Rx Only ANIMALS = Caution:

Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

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Ectoparasites - Fleas

Treatment

Comprehensive flea-control programs should¹

Eliminate fleas on pets

Eliminate existing environmental infestations

Prevent subsequent re-infestation

Remember:

Only approximately 1% of the flea population are present as adults.²

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Ectoparasites - Fleas

Treatment

Flea treatment products include:

Flea adulticides
Insect growth regulators (IGRs)
Insect development inhibitors (IDIs)

IGRs and IDIs examples include:

lufenuron
methoprene
pyriproxyfen

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Ectoparasites - Fleas

Treatment

Flea adulticides

Oral products
Spot-on or spray products
Flea collars

The newer flea control products

Less potential toxicity than Dips that were used in the past
More efficacious than flea shampoos

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Ectoparasites - Fleas

Treatment

Oral Products

	<u>Species</u>	<u>Interval</u>
Nexgard® (afoxolaner)	dogs	monthly
Simparica® (sarolaner)	dogs	monthly
Bravecto® (fluralaner)	dogs	every 3 months
Comfortis® (spinosad)	dogs and cats	monthly
Capstar® (nitenpyram)	dogs and cats	daily or as-needed

Spot-on Products

	<u>Species</u>	<u>Interval</u>
Revolution® (selamectin)	dogs and cats	monthly
Frontline® (fipronil)	dogs and cats	monthly
Advantage® (imidacloprid)	dogs and cats	monthly
Activyl® (indoxacarb)	dogs and cats	monthly
Vectra® (dinotefuran)	dogs and cats	monthly
Bravecto® (fluralaner)	dogs and cats	every 3 months

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Ectoparasites - Fleas

Treatment

Flea Collars

Seresto® (imidacloprid/flumethrin)
Scalibor® (deltamethrin)

Species

dogs and cats
dogs

Interval

8-month collar
6-month collar

Synthetic pyrethrins* (various formulations)

cyphenothrin
permethrin
deltamethrin
flumethrin

Species

dogs
dogs
dogs
dogs and cats

Interval

varies with product
varies with product
varies with product
varies with product

*Note: Synthetic pyrethrins can be toxic to cats resulting in seizures and possible death.

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Comment.....

Ticks wait for a host, resting on the tips of grasses and shrubs.⁴

Comment.....

When a host brushes the spot where a tick is waiting, it quickly climbs aboard.⁴

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Ectoparasites - Ticks

Hard tick species common on dogs and cats in North America are all 'three-host' ticks.⁴

Meaning.....

Each developing stage often feeds on a different host

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Ectoparasites - Ticks

Hard tick species common on dogs and cats in North America

Life stages include⁴

- Larva
- Nymph
- Adult

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Ectoparasites - Ticks

Life cycle

The eight-legged adults

- Find a third host on which to feed

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Species of Ticks Infesting Dogs and Cats in North America⁴

Lone Star Tick (<i>Amblyomma americanum</i>)	Dog and Cat
American Dog Tick (<i>Dermacentor variabilis</i>)	Dog and Cat
Black-legged Tick (<i>Ixodes scapularis</i>)	Dog and Cat
Spinose Ear Tick (<i>Otobius megnini</i>)	Dog and Cat

Gulf Coast Tick (<i>Amblyomma maculatum</i>)	Dog
Rocky Mountain Wood Tick (<i>Dermacentor andersoni</i>)	Dog
Western Black-legged Tick (<i>Ixodes pacificus</i>)	Dog
Brown Dog Tick (<i>Rhipicephalus sanguineus</i>)	Dog

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Common Species of Ticks Found In Georgia⁵

Three Species of ticks common in Georgia that transmit zoonotic diseases:¹

Lone Star Tick (*Amblyomma americanum*) - Most Common in Georgia

- Human Monocyte Ehrlichiosis (HME)
- Southern Tick-Associated Rash Illness (STARI)

American Dog Tick (*Dermacentor variabilis*) – Second Most Common

- Rocky Mountain Spotted Fever

Black-legged Tick (*Ixodes scapularis*)

- Lyme Disease
- Human Granulocytic Anaplasmosis (HGA)

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Direct Disease Associated with Ticks

Direct Disease⁴

- Irritation and pruritus at attachment site
- Anemia from blood loss
- Secondary infections at attachment site
- Allergic hypersensitivity
- Tick paralysis

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Zoonotic Pathogens Transmitted by Ticks³

- Anaplasmosis
- Babesiosis
- *Borrelia mayonii*
- *Borrelia miyamotoi*
- Colorado tick fever
- Ehrlichiosis
- Heartland virus
- Lyme disease
- Powassan disease
- *Rickettsia parkeri* rickettsiosis
- Rocky Mountain spotted fever (RMSF)
- STARI (Southern tick-associated rash illness)
- Tickborne relapsing fever (TBRF)
- Tularemia
- 364D rickettsiosis

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Ectoparasites - Ticks

Public Health Considerations

All of the ticks that infest dogs and cats also feed on people and can transmit numerous zoonotic agents.⁴

People become infested with ticks in the same way as their pets, i.e., encountering ticks in tick-infested environments.⁴

Perform frequent tick checks when visiting potential tick-infested areas.⁴

Keep pets on tick-control products year round.⁴

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Ectoparasites - Ticks

Treatment

Oral Products Species Interval

Nexgard® (afoxolaner)	dogs	monthly
Simparica® (sarolaner)	dogs	monthly
Bravecto® (fluralaner)	dogs	every 2 months

Spot-on Products Species Interval

Revolution® (selamectin)*	dogs	monthly
Frontline® (fipronil)	dogs and cats	monthly
Sergeant's Silver (etofenprox)	cats	monthly

*American Dog tick only

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Ectoparasites - Ticks**Treatment****Spot-on Products**
Combinations

<u>Spot-on Products</u>	<u>Species</u>	<u>Interval</u>
Activyl® Tick Plus (indoxacarb/ permethrin)	dogs	monthly
Vectra ® 3D (dinotefuran/pyriproxyfen/permethrin)	dogs	monthly
Catego™ (dinotefuran/pyriproxyfen/fipronil)	cats	monthly

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Ectoparasites - Ticks**Treatment**

<u>Collars</u>	<u>Species</u>	<u>Interval</u>
Seresto® (imidacloprid/flumethrin)	dogs and cats	8-month collar
Scalibor® (deltamethrin)	dogs	6-month collar

Synthetic pyrethrins* (various formulations)

	<u>Species</u>	<u>Interval</u>
cyphenothrin	dogs	varies with product
permethrin	dogs	varies with product
deltamethrin	dogs	varies with product
flumethrin	dogs and cats	varies with product

*Note: Synthetic pyrethrins can be toxic to cats resulting in seizures and possible death.

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Ectoparasites – Mites
Demodex (Mange Mite)

Most *Demodex* spp. are considered normal mammalian fauna.⁶

Overgrowth of mites is secondary to systemic disease or immune defect.⁶

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Ectoparasites – Mites

Demodex (Mange Mite)

Demodex mites infest hair follicles and sebaceous glands.⁶

Canine demodicosis⁶

- *Demodex canis*

Feline demodicosis⁶

- *Demodex cati* & *Demodex gato*

Canine demodicosis is common⁶

Feline demodicosis is rare⁶

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Ectoparasites – Mites

Demodex (Mange Mite)

Canine demodicosis

- **Localized**
- **Generalized**

May present in either juvenile or adult dogs.

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Ectoparasites – Mites

Demodex (Mange Mite)

Localized Canine demodicosis

Clinical Signs⁶

- Mild, Nonpruritic
- Patchy alopecia on the head or limbs
- Usually in puppies less than 6 months of age
- Most cases resolve spontaneously without treatment

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Ectoparasites – Mites

Demodex (Mange Mite)

Generalized Canine demodicosis

Clinical Signs⁶

- Moderate to severe disease
- May develop anywhere on the body
- Alopecia
- Erythema
- Secondary superficial or deep pyoderma

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Ectoparasites – Mites

Demodex (Mange Mite)

Diagnosis

Microscopic examination of deep skin scrapes from affected areas of alopecia.

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Case 2

Lucky

- Species – Canine
- Breed – Longhair Dachshund
- Gender – Female / Intact
- Age – 4 months
- Weight – 12 pounds

- Presented for Spay

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Physical Exam

Lucky

Temp 100.2
Heart rate 160
Respiration 48
CRT – <2
Body Score 3 out of 5
Alopecia noted on dorsal head area

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Case 2 – Lucky

Diagnosis – Localized Demodex

Plan:

Apply Neosporin® to skin scrape area twice daily until healed.

Rx:

Bravecto® (fluralaner) 250 mg tablet

Dispense 1 tablet

Sig: Give one tablet orally.

Recheck in 30 days

Comment: Bravecto® (fluralaner) chew tablet is approved to prevent fleas and ticks in dogs and given orally every 3 months. It can be used extralabel to treat demodicosis.

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Ectoparasites - Demodex

Public Health Considerations

Demodex mites are host-adapted.⁶

There is no zoonotic potential in either canine or feline demodicosis.⁶

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Ectoparasites – Demodex

Treatment in Dogs

Approved miticidal treatment for generalized demodicosis
Amitraz dip (Mitaban®)

Extralabel treatment for localized demodicosis
Rotenone-based insecticide ointment (Goodwinol)

Extralabel treatment of *Demodex

Ivermectin
 Milbemycin oxime
 Moxidectin
 Doramectin
 Fluralaner

<https://www.ccpvet.org/ccpo-recommendations/demodex-mange-mite/>

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Ectoparasites – Demodex

Treatment in Dogs

***Herding breeds such as Collies, Shetland Sheepdogs, Border Collies, Australian Shepherds, and Old English Sheepdogs, as well as other canines may have mutations in their MDR1 genes which predisposes to an increased risk of toxicity to macrocyclic lactones.**

Extralabel treatment of *Demodex

Ivermectin
 Milbemycin oxime
 Moxidectin
 Doramectin
 Fluralaner

<https://www.ccpvet.org/ccpo-recommendations/demodex-mange-mite/>

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Ectoparasites – Demodex

Treatment in Cats

No products are labeled for demodicosis in cats.¹

Extralabel treatment of *Demodex*

Lime Sulfur Dip – treat *Demodex gatoi*
Ivermectin – Side effects may occur
Doramectin – treat follicular demodicosis
Amitraz – Side effects may occur

<https://www.ccpvet.org/ccpo-recommendations/demodex-mange-mite/>

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Ectoparasites – Canine Scabies

Canine scabies is caused by *Sarcoptes scabiei*

- Superficial skin mite^{7,8}
- Mites tunnel in the skin^{7,8}
 - Female glues eggs to the tunnel walls⁷
- Secrete allergic substances that produce intense pruritic dermatitis^{7,8}

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Ectoparasites – Canine Scabies

Signs of infection

- Hyperkeratosis and alopecia⁷
- Initially dry crusted lesions that become pruritic⁷
- Excoriation often develops a serous exudate⁷

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Ectoparasites – Canine Scabies

Signs of infection

- Highly pruritic lesions are often the cause of self-mutilation.⁷
- Lesions may become bloody secondary to scratching⁷
- Secondary skin infections can occur

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Ectoparasites – Canine Scabies

Lesions typically noted on

- Margins of the ears^{7,8}
- Lateral elbows^{7,8}
- Lateral hocks^{7,8}
- Ventral abdomen and chest^{7,8}

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Ectoparasites – Canine Scabies

Diagnosis

- Skin scrapings
 - Deep enough to examine the full thickness of the epidermis⁷
 - Sample that is tinged with blood⁷
 - Examined under the microscope.⁷

Sometime the mite can be difficult to find.

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Ectoparasites – Canine Scabies

Public Health Considerations

People can develop a self-limiting infestation with *S. scabiei* from dogs.¹

- Highly pruritic lesions⁷
- Usually clear without the need for specific treatment for the mite infestation.⁷
- If lesions persist or are particularly uncomfortable, a dermatologist should be consulted.⁷

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Ectoparasites – Canine Scabies Treatment

Label approved for treatment and control of sarcoptic mange on dogs

- Revolution® (selamectin)
- Advantage Multi® (moxidectin/imidacloprid)
- Seresto® collars (flumethrin/imidacloprid)

Label approved as “aids in control of sarcoptic mange”¹

- Frontline® (fipronil)

¹<https://www.ccpvet.org/ccpo-recommendations/sarcoptic-mite/>

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Ectoparasites – Canine Scabies Treatment

Extralabel treatment of sarcoptic mange in dogs

- Ivermectin
- Doramectin

Extralabel treatment of sarcoptic mange in dogs & cats

- Lime Sulfur Dip

Plumb's Veterinary Drug Handbook 8th Edition

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Ectoparasites – Otodectic Mite

***Otodectes cynotis* (ear mite)**

A cause of otitis externa in dogs and cats.

- Mites primarily infect the ear canal
 - Can live on adjacent skin
- Cats can have more than 1,000 mites per ear⁹

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Ectoparasites – Otodectic Mite

***Otodectes cynotis* (ear mite)**

A cause of otitis externa in dogs and cats.

- Marked accumulation of dark brown to black waxy or crusty exudate in the ear canals.
- Secondary bacterial otitis can develop

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Ectoparasites – Otodectic Mite

Clinical signs

- Shaking of the head
- Scratching at the ears
- Inflammation of the ear canals
- Accumulation of copious dark crusty cerumen
- Serous to purulent exudates.⁹

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Ectoparasites – Otodectic Mite

Diagnosis

Examining swabs of the
ear canal exudate under
the microscope.

<https://www.bing.com/images/search?mkt=US&FORM=H4871&from=ear+canal+exudate&id=581000d1-91ca-7011-0921-0f46d0f230d7&sim=EntityAnswer&sim=Otitis+Externa+H4871>

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Ectoparasites - Otodectic Mite

Public Health Considerations

On very rare occasions, people have been infested with ear mites.⁹

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Ectoparasites – Otodectic Mite

Treatment in Cats

Approved products include:¹

- Advantage Multi® for cats (moxidectin/imidacloprid)
- Revolution® for cats (selamectin)
- ACarexx® (ivermectin)

Combination Product

- TRESADERM® solution (thiabendazole-dexamethasone-neomycin sulfate)

Cleaning of the ear canal is always recommended prior to administration.¹

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¹ <https://www.cvgovet.org/cvgovet-recommendations/otodectic-mite-ear-mites/>

Ectoparasites – Otodectic Mite

Treatment in Dogs

Labeled products include:

- Revolution® for dogs (selamectin)

Combination Product

- TRESADERM® (thiabendazole-dexamethasone-neomycin sulfate solution)

Cleaning of the ear canal is always recommended prior to administration.¹

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¹ <https://www.cvgovet.org/cvgovet-recommendations/otodectic-mite-ear-mites/>

Questions ?

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