zoetis

DIAGNOSING SKIN CONDITIONS IN PRURITIC DOGS

with cytology

A quick reference guide to help you identify and diagnose skin conditions in pruritic dogs using cytological techniques.

avdap
australian veterinary dermatology advisory panel

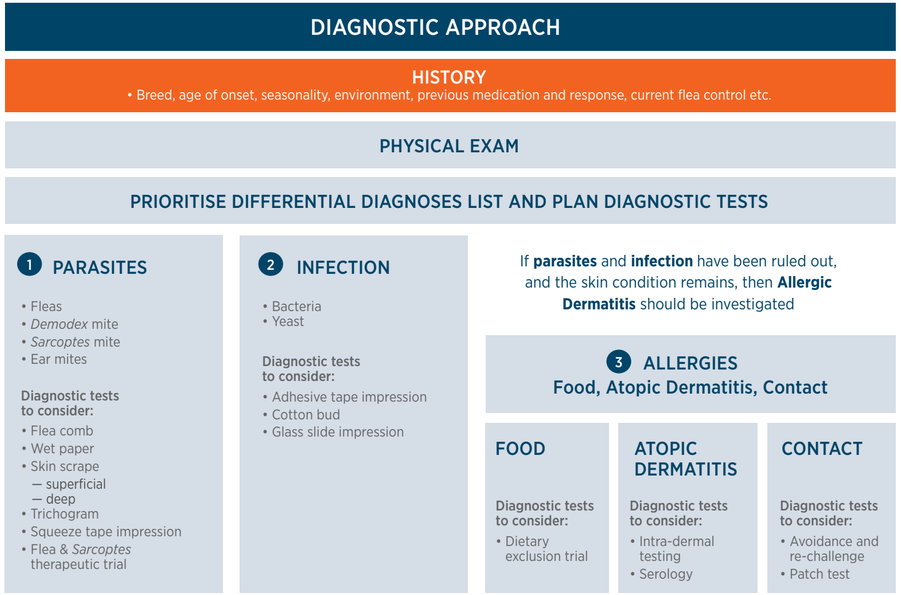
Start from Scratch
FOR HEALTHY SKIN

CONTENTS

OVERVIEW OF DIAGNOSING PRURITUS IN DOGS

USING A DIAGNOSTIC APPROACH TO IDENTIFY THE CAUSE OF PRURITUS

The steps for using a diagnostic approach to determine the underlying cause of pruritus are summarised in the current AVDAP guidelines:[1]



Diagnostic approach for diagnosis and management of pruritic dogs.

OVERVIEW OF DIAGNOSING PRURITUS IN DOGS

USING A DIAGNOSTIC APPROACH TO IDENTIFY THE CAUSE OF PRURITUS

FOLLOWING AN ASSESSMENT OF HISTORY, A DERMATOLOGICAL EXAM SHOULD BE PERFORMED BY: [1]

1. Assessing coat quality and general body condition
2. Identifying any lesions or parasites e.g. fleas that are present
3. Determining distribution of lesions

"EVERY PRURITIC DOG SHOULD HAVE SOME FORM OF MICROSCOPIC TEST PERFORMED"

Prof Peter Hill, Professor of Veterinary Dermatology and Immunology, University of Adelaide.

To learn more about performing diagnostics and interpreting cytology watch the video series featuring Professor Peter Hill and Dr Dani Hoolahan **www.zoetis.com.au/cytology**

ECTOPARASITES

CONDITION: FLEA ALLERGY DERMATITIS

LESION DISTRIBUTION

- Typically found in the dorsal lumbar area or on the ventral abdomen and inguinal region

TYPES OF LESIONS

Flea bite hypersensitivity

Image courtesy of Mike Shipstone

Erosion ulceration hot spot

Image courtesy of Peter Hill

- *Acute* - erythematous macules, papules, crusted papules, acute moist dermatitis (hot spots)
- *Chronic* - self-induced alopecia, lichenification, hyperpigmentation

DIAGNOSTIC TEST:

- Coat Brushing (refer to page 13)

FOR FURTHER INFORMATION ON LESIONS SEEN IN FLEA ALLERGY DERMATITIS, PLEASE CONSULT THE AVDAP GUIDELINES, AVAILABLE AT ZOETIS.COM.AU/AVDAP

ECTOPARASITES

CONDITION: SARCOPTIC MITES

LESION DISTRIBUTION

- Typically found in thinly skin, sparsely haired areas, such as the pinna, back of elbows, and backs of hocks

TYPES OF LESIONS

- Predominant lesions include eruption, erythema, scaling, excoriations
- In severe cases the lesions may extend over the entire body

DIAGNOSTIC TEST:

- Superficial Skin Scraping (refer to page 15)

FOR FURTHER INFORMATION ON LESIONS SEEN IN SARCOPTIC MITES, PLEASE CONSULT THE AVDAP GUIDELINES, AVAILABLE AT ZOETIS.COM.AU/AVDAP

ECTOPARASITES

CONDITION: DEMODEX

LESION DISTRIBUTION

- Localised or generalised lesions may be present

TYPES OF LESIONS

Typical lesions include alopecia, erythema, follicular casts, scale, comedones, and hyperpigmentation in chronic cases

In severe cases, papules, pustules, furunculoses and ulcers may be seen, particularly if secondary infection is present

DIAGNOSTIC TESTS:

- Deep Skin Scraping (refer to page 17)
- Trichogram (refer to page 19)
- Unstained Tape Strip (refer to page 21)

FOR FURTHER INFORMATION ON LESIONS SEEN IN DEMODEX, PLEASE CONSULT THE AVDAP GUIDELINES, AVAILABLE AT ZOETIS.COM.AU/AVDAP

CANINE INFECTIOUS SKIN DISEASES

CONDITION: STAPHYLOCOCCAL PYODERMA

LESION DISTRIBUTION

- Tends to affect the trunk and ventral areas of the dog
- Pyoderma may frequently involve the dorsum and feet

TYPES OF LESIONS

Staphylococcal pyoderma
Image courtesy of Mike Shipstone

Epidermal collarettes
Image courtesy of Mike Shipstone

- *Acute* – papules, pustules, epidermal collarettes, staphylococcal rings, circular patches of alopecia
- *Chronic* – lichenification, hyperpigmentation, greasiness and scaling

DIAGNOSTIC TESTS:

- Stained Tape Strip (refer to page 23)
- Impression Smear (refer to page 25)

FOR FURTHER INFORMATION ON LESIONS SEEN IN STAPHYLOCOCCAL PYODERMA, PLEASE CONSULT THE AVDAP GUIDELINES, AVAILABLE AT ZOETIS.COM.AU/AVDAP

CANINE INFECTIOUS SKIN DISEASES

CONDITION: *MALASSEZIA* DERMATITIS

LESION DISTRIBUTION

- Similar lesion distribution as atopic dermatitis.
- Tends to affect the face, ears, ventral neck, axially, paws, and perineum

TYPES OF LESIONS

- Predominant lesions include erythema, yellowish or brownish greasy scale, and hyperpigmentation with chronicity

DIAGNOSTIC TEST:

- Stained Tape Strip (refer to page 23)

FOR FURTHER INFORMATION ON LESIONS SEEN IN *MALASSEZIA* DERMATITIS, PLEASE CONSULT THE AVDAP GUIDELINES, AVAILABLE AT ZOETIS.COM.AU/AVDAP

CANINE FUNGAL SKIN DISEASES

CONDITION: DERMATOPHYTOSIS

TYPES OF LESIONS

DIAGNOSTIC TESTS:

- Wood's Lamp Examination (refer to page 27)
- Stained Tape Strip (refer to page 23)
- Trichogram (refer to page 19)
- Fungal Culture (refer to page 29)

FOR FURTHER INFORMATION ON DERMATOPHYTOSIS, PLEASE CONSULT THE AVDAP GUIDELINES, AVAILABLE AT ZOETIS.COM.AU/AVDAP

CANINE OTITIS EXTERNA

CONDITION: OTITIS

LESION DISTRIBUTION

- Typical presentation of pruritus around the face and ear area

TYPES OF LESIONS

- Predominant lesions include erythema, discharge and odour
- Can have multiple triggers including ectoparasites, allergic dermatitis, foreign bodies and tumours – The most common cause is allergic dermatitis

DIAGNOSTIC TESTS:

- Cotton Tip Swab - Ectoparasites (refer to page 30)
- Cotton Tip Swab - Microbes (refer to page 32)
- Culture and Sensitivity (refer to page 34)

FOR FURTHER INFORMATION ON OTITIS, PLEASE CONSULT THE AVDAP GUIDELINES, AVAILABLE AT ZOETIS.COM.AU/AVDAP

DIAGNOSTIC TEST

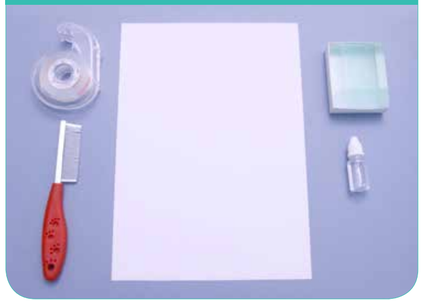
COAT BRUSHING

SUSPECTED CONDITION:

- Flea Allergy Dermatitis

MATERIALS REQUIRED

- Flea Comb
- White Paper
- Glass Slide
- Adhesive Tape
- Mineral Oil



PROCEDURE STEPS

1. Using a fine-tooth flea comb, brush the dog repeatedly.
2. Transfer hair sample from comb onto a piece of paper.
3. Tease the hair sample with fingers to allow debris to fall out onto the paper.

FOR INFORMATION ABOUT AVAILABLE TREATMENT OPTIONS, PLEASE REFER TO THE AVDAP GUIDELINES, AVAILABLE AT ZOETIS.COM.AU/AVDAP

DIAGNOSTIC TEST

COAT BRUSHING

POSITIVE DIAGNOSTIC TEST RESULT

FLEA ALLERGY DERMATITIS

A test result showing two fleas and a number of lice

DIAGNOSTIC TEST

SUPERFICIAL SKIN SCRAPING

SUSPECTED CONDITION:

- Sarcoptic Mites

MATERIALS REQUIRED

- Clippers
- Mineral Oil
- Glass Slide
- Blunted Scalpel Blade

PROCEDURE STEPS

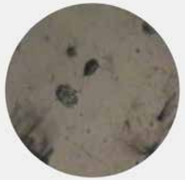
1. Place mineral oil/liquid paraffin onto a glass slide, then moisten the edge of a blunted scalpel blade with a bit of the oil.
2. Add a little bit of oil onto the area that will be scraped.
3. Using the blunted scalpel blade, scrape the surface of skin, collecting any surface debris and material.
4. Transfer material collected onto the oil on the glass slide, and mix.
5. Place a cover slip on top of the oil that the specimen is suspended in – now this slide is ready to be viewed under the microscope.

DIAGNOSTIC TEST

SUPERFICIAL SKIN SCRAPING

POSITIVE DIAGNOSTIC TEST RESULTS

SARCOPTIC MITES



SARCOPTES SEEN ON SUPERFICIAL SKIN SCRAPE

Video courtesy of Peter Hill

SARCOPTES MITE – ADULT AND EGG

10x lens / image courtesy of Linda Vogelnest

Sarcoptic mites and eggs can be seen. These mites typically have an oval shape with short stumpy legs.

DIAGNOSTIC TEST

DEEP SKIN SCRAPING

SUSPECTED CONDITION:

- Demodex

MATERIALS REQUIRED

- Clippers
- Mineral Oil
- Glass Slide
- Blunted Scalpel Blade

PROCEDURE STEPS

1 Place mineral oil/liquid paraffin onto a glass slide.

2 Moisten the edge of a blunted scalpel blade with a bit of the oil on the slide.

3 Place a little bit of oil on the area that is going to be scraped, then scrape the skin until you see capillary oozing.

4 Scrape up the material onto the blade, squeezing the skin to force any mites within the hair follicles onto the surface.

5 Transfer material from the blade onto the slide, mixing it with the oil.

DIAGNOSTIC TEST

DEEP SKIN SCRAPING

POSITIVE DIAGNOSTIC TEST RESULTS

DEMODEX

DEMODEX CANIS
Video courtesy of Peter Hill

DEMODEX CANIS PLUS LARVA
High Power / Image courtesy of Peter Hill

DEMODEX CANIS PLUS LARVA AND EGG
10x Lens / Image courtesy of Linda Vogelniest

DEMODEX INJAI (LONG BODIED DEMODEX)
High Power / Image courtesy of Peter Hill

It is common to see many forms of the demodex mite life cycle (e.g. eggs, juvenile and adult).

DIAGNOSTIC TEST

TRICHOGRAM

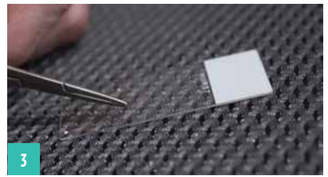
SUSPECTED CONDITIONS:

- Demodex
- Dermatophytosis

MATERIALS REQUIRED

- Artery Forceps / Hemostat
- Mineral Oil
- Glass Slide

PROCEDURE STEPS



1. Place mineral oil onto a glass slide.
2. Using a hemostat/artery forceps, grasp some hairs at the base and pluck them out.
3. Transfer hairs onto the slide, aligning them in the same direction. Repeat process until there are >50 hairs on the slide.
4. Place a cover slip on top of the oil that contains the specimen – Now this slide is ready to be viewed under a microscope.

DIAGNOSTIC TEST

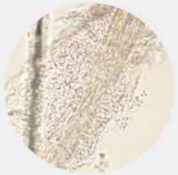
TRICHOGRAM

POSITIVE DIAGNOSTIC TEST RESULTS

DEMODEX

Large numbers of demodex can be seen clustered around the hair shafts.

DERMATOPHYTOSIS



Hair shafts are covered in arthrospores (produced by the fungus).

DIAGNOSTIC TEST

UNSTAINED TAPE STRIP

SUSPECTED CONDITION:

- Demodex

MATERIALS REQUIRED

- Clippers
- Adhesive Tape
- Glass Slide
- Mineral Oil

PROCEDURE STEPS

1. Take a length of sticky tape, about the same length as the glass slide.
2. To sample the area of interest, press the tape repeatedly onto the surface of the skin.
3. Take hold of the skin to try and squeeze out the mites from the hair follicle, then continue to collect material using the sticky tape.
4. Fasten the end of the tape to a slide.
5. Apply immersion oil onto the slide, then fold the tape over.

DIAGNOSTIC TEST

UNSTAINED TAPE STRIP

POSITIVE DIAGNOSTIC TEST RESULT

DEMODEX

DEMODEX CANIS ON TAPE SQUEEZE

10x Lens / Image courtesy of Linda Vogelnest

Multiple demodex mites can be seen.

DIAGNOSTIC TEST

STAINED TAPE STRIP

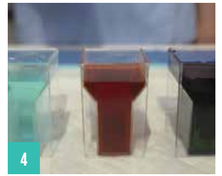
SUSPECTED CONDITIONS:

- Staphylococcal Pyoderma
- *Malassezia* Dermatitis
- Dermatophytosis

MATERIALS REQUIRED

- Transparent Scotch Tape
- Glass Slide

PROCEDURE STEPS



1 Take a length of sticky tape, about the same length as the glass slide.

2 To sample the area of interest, press the tape repeatedly onto the skin until it has lost its adhesiveness.

3 Fasten the tape to the end of a glass slide in order to get it ready for staining.

4 Stain slide using *Diff-Quik*®: Immerse the slide into methanol - fixative, Eosin - red dye, then methylene blue - blue dye (approximately 5 x 1 second for each solution).

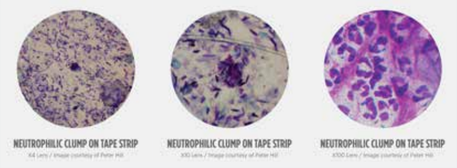
5 After staining, rinse under running water, fold tape back onto slide, then dry with a paper towel – Now the slide is ready to be examined under a microscope.

DIAGNOSTIC TEST

STAINED TAPE STRIP

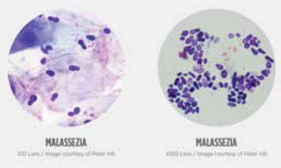
POSITIVE DIAGNOSTIC TEST RESULTS

STAPHYLOCOCCAL PYODERMA



Dark purple clumps contain large numbers of degenerate neutrophils – within these are large numbers of *staphylococci* (scan low power first).

MALASSEZIA DERMATITIS



Malassezia organisms stained blue or purple.

DERMATOPHYTOSIS

Fungal hyphae are attached to the corneocyte.

DIAGNOSTIC TEST

IMPRESSION SMEAR

SUSPECTED CONDITION:

- Staphylococcal Pyoderma

MATERIALS REQUIRED

- Glass Slide

PROCEDURE STEPS

1 Apply the slide directly to skin surface (area of lesion that contains pus, is moist or oozing) to collect the material.

2 Stain slide using *Diff-Quik*: Immerse the slide into methanol - fixative, Eosin - red dye, then methylene blue - blue dye (approximately 5 x 1 second for each solution).

3 Rinse slide under running water, then leave to air dry or use a hair dryer.

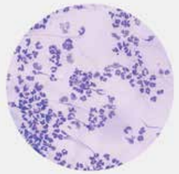
4 When dry, place a drop of immersion oil directly onto the slide then place a cover slip over the top – Now the slide is ready to be examined under a microscope.

DIAGNOSTIC TEST

IMPRESSION SMEAR

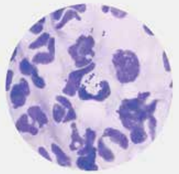
POSITIVE DIAGNOSTIC TEST RESULTS

STAPHYLOCOCCAL PYODERMA



NEUTROPHILS

X4 Lens / Image courtesy of Peter Hill



NEUTROPHILS DEGENERATE (PYODERMA)

X10 Lens / Image courtesy of Peter Hill

Dark purple clumps contain large numbers of degenerate neutrophils – within these are large numbers of *staphylococci* (scan low power first).

DIAGNOSTIC TEST

WOOD'S LAMP EXAMINATION

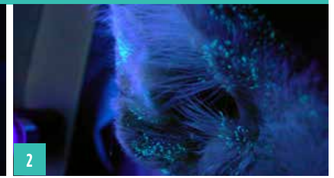
SUSPECTED CONDITION:

- Dermatophytosis

MATERIALS REQUIRED

- Wood's Lamp

PROCEDURE STEPS



1 Examine the surface of the skin and hairs with an ultraviolet lamp.

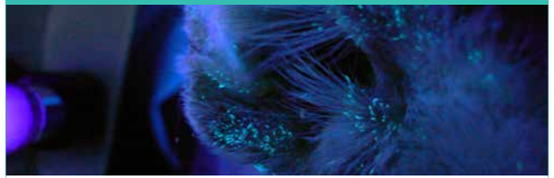
2 Check to see if any of the hairs are fluorescing.

DIAGNOSTIC TEST

WOOD'S LAMP EXAMINATION

POSITIVE DIAGNOSTIC TEST RESULT

DERMATOPHYTOSIS



A positive result shows hairs that fluoresce an apple green colour. Only certain species of dermatophyte fluoresce under the Wood's lamp, and therefore other diagnostic testing may be needed following a negative result. Some other structures (e.g. dust particles) can artificially fluoresce a purple colour.

DIAGNOSTIC TEST

FUNGAL CULTURE

SUSPECTED CONDITION:

- Dermatophytosis

MATERIALS REQUIRED

- New Toothbrush
- Artery Forceps/Hemostat
- Sterile Container
- Nail Clippers

PROCEDURE STEPS

A fungal culture test is usually performed if negative results for dermatophytosis are found in other tests:

1. Using a new toothbrush, brush the dog's coat and focus on areas where the skin condition is suspected.
2. Use nail clippers to cut the head off the toothbrush into a specimen container.
3. You can also take a sample for fungal culture by plucking hairs from around the edge of the lesion.
4. Add these hairs to the specimen container (containing the toothbrush head) for pathological testing.

DIAGNOSTIC TEST

COTTON TIP SWAB - OTIC ECTOPARASITES

SUSPECTED CONDITIONS:

- Otitis ectoparasites
- Demodex

MATERIALS REQUIRED

- Cotton Tip Swab
- Glass Slide

PROCEDURE STEPS

1. Perform an otoscopic exam to check the state of the canals before checking cytological findings.
2. Place liquid paraffin/mineral oil onto a slide then dip the cotton tip.
3. Put cotton tip swab into ear canal and scoop out material.
4. Transfer the material collected from cotton tip onto the oil on the slide. Indicate which ear (left or right) the sample has come from on the slide.
5. Place a cover slip over the oil – Now the slide is ready for examination.

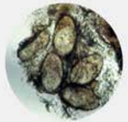
DIAGNOSTIC TEST

COTTON TIP SWAB - OTIC ECTOPARASITES

POSITIVE DIAGNOSTIC TEST RESULTS

OTITIS ECTOPARASITES

OTODECTES CYNOTIS



OTODECTES CYNOTIS EGGS

Otodectes cynotis mite (common ear mite) and eggs that come from the parasites can be seen.

DEMODEX

DEMODEX CANIS

Samples taken from the ear may also show demodex mites.

DIAGNOSTIC TESTS

DIAGNOSTIC TEST

COTTON TIP SWAB - OTIC MICROBES

SUSPECTED CONDITION:

- Otitis microbes

MATERIALS REQUIRED

- Cotton Tip Swab
- Glass Slide

PROCEDURE STEPS

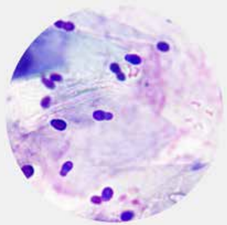
1. Insert a cotton tip into the ear, push it into the base of the vertical canal, and then gently rotate.
2. Pull out the cotton tip then roll the material collected onto a glass slide – Indicate which ear (left or right) the sample has come from on the slide.
3. Stain slide using *Diff-Quik*: Immerse the slide into methanol - fixative, Eosin - red dye, then methylene blue - blue dye (approximately 5 x 1 second for each solution).
4. Rinse slide under running water, then leave to air dry or use a hair dryer.
5. When dry, place a drop of immersion oil directly onto the slide then place a cover slip over the top – This slide is now ready for examination under the microscope.

DIAGNOSTIC TEST

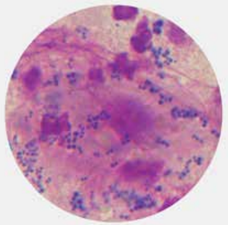
COTTON TIP SWAB - OTIC MICROBES

POSITIVE DIAGNOSTIC TEST RESULTS

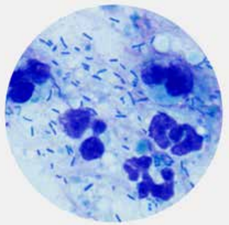
OTITIS MICROBES



MALASSEZIA OTITIS
X100 Lens / Image courtesy of Peter Hill



STAPHYLOCOCCI BACTERIAL OVERGROWTH
X100 / Image courtesy of Peter Hill



OTITIS ASSOCIATED WITH RODS
X100 / Image courtesy of Peter Hill

Overgrowth of *Malassezia, staphylococci* or rod infection in an ear smear.

DIAGNOSTIC TESTS

DIAGNOSTIC TEST

CULTURE AND SENSITIVITY - EAR CANAL

SUSPECTED CONDITION:

- Otitis

MATERIALS REQUIRED

- Sterile tissue culture swab

PROCEDURE STEPS

If rods are found in cytology, perform a culture and sensitivity test:

1. If a sample needs to be cultured, use a sterile tissue culture swab.
2. Insert swab into the ear, push it into the base of the vertical canal, and then gently rotate.
3. Take out swab and place it directly into transport container.

Join Professor Peter Hill and Dr Dani Hoolahan as they show you how to diagnose, perform and interpret skin cytology in the Start from Scratch video series
www.zoetis.com.au/cytology

REFERENCE:

1. Australian Veterinary Dermatology Advisory Panel (AVDAP). Guidelines for the diagnosis and management of pruritus in dogs. March 18. Available at: www.zoetis.com.au/avdap

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