1

Managing the Small Animal Dermatology Patient

Kim Horne

Introduction

The skin is the largest organ of the body and performs many vital functions. It acts as a barrier; offers protection against environmental elements and the development of infections and cutaneous neoplasms; produces vitamin D and keratinized structures such as the hair and claws; regulates temperature; acts as storage for materials such as electrolytes and vitamins; is a primary sense organ; and is an important indicator of general health as well as internal disease (Miller et al. 2013). Skin and ear diseases are very common in our small animal patients. Recent statistics show that pet insurance policyholders' top four medical conditions were related to ear and skin problems (Nationwide 2018). While these may not be the primary reason the patient is presented to the veterinary hospital, clients will often ask to have their pet's skin or ears checked during the visit; or you may discover something during the physical exam that the client was not aware of. Unfortunately, many different dermatological diseases present with similar clinical signs and many of these conditions are only controllable and not curable. Dealing with these cases can be time consuming and frustrating for the pet owner as well as the veterinary staff. The good news is that veterinary technicians and veterinary nurses can play an important role in all aspects of the management of these cases. From taking a complete history, performing diagnostic procedures correctly, to providing thorough client education and following up with the patients' progress – these are the essential elements for achieving success with these cases. The technician's involvement with phone call updates and ensuring recheck appointments are scheduled can improve client compliance and lead to improved patient management.

History

A dermatology history questionnaire can be an efficient way to collect important information. Many dermatology books contain examples of these which can be modified to fit the needs of each practice (Bergvall 2012; Miller et al. 2013). See Figure 1.1 for an example. Filling out the questionnaire will get the client thinking about their pet's dermatology problems, and should be completed prior to the exam. Ideally the questionnaire can be sent to the client in advance of the appointment or the client can arrive early in order to complete the questionnaire. The questionnaire can be very helpful not only for the initial appointment, but also to refer back to if and when the pet's problem recurs or symptoms change.

When taking the history, the breed, age, and sex of the patient can give clues as to

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DERMATOLOGY HISTORY

University of Minnesota
Veterinary Medical Center

Place patient label here

1) How long have you owned this pet?_____
2) From what source did you get this pet? _____
_____
3) Is this the first time your pet has had a skin/ear problem?
☐ No ☐ Yes
4) If No, when was the first occurrence? _____
5) What area of the body was involved first? _____
6) What area of the body was involved next?_____
7) Initial appearance of the involved skin? _____
8) How did the involved skin change as time went on?_____
_____
9) What do you think caused the problem? _____
10) Do the parents or siblings have a skin problem? ☐ No ☐ Yes ☐ Unknown
11) Previous medications? _____
12) Response to previous medications?_____
13) Does your pet swim? ☐ No ☐Yes
14) What is your pet's bed made of?_____
15) Reason for visit? _____
16) When did this problem begin? _____
17) Is your pet taking any medications currently? ☐ No ☐ Yes
If YES, please list drug and dosage_____
Response to current meds?_____
18) Any adverse drug or vaccination reaction? ☐ No ☐ Yes Describe:_____
19) Any previous illness, surgery or trauma? ☐ No ☐ Yes Describe:_____
20) Any eye or nasal discharge? ☐ No ☐ Yes Describe:_____
21) Any vomiting or diarrhea? ☐ No ☐ Yes Describe:_____
22) Any coughing or sneezing? ☐ No ☐ Yes Describe:_____
23) Any change in urination or defecation? ☐ No ☐ Yes Describe:_____
24) Any change in food or water intake? ☐ No ☐ Yes Describe:_____
25) Any change in weight? ☐ No ☐ Yes Describe:_____
26) Current Diets and treats – include amount and frequency: _____
_____
27) Any change in activity or mobility? ☐ No ☐ Yes Describe:_____
28) Any skin or hair coat concerns? ☐ No ☐ Yes Describe:_____
29) Any behavior, vision, hearing changes or concerns? ☐ No ☐ Yes Describe:_____
30) List preventative medications used (heartworm, flea control): _____
_____
31) Is your pet up-to-date with vaccinations? ☐ No ☐ Yes
List vaccine and dates given:_____
32) Describe your pet's housing environment:_____
33) Does the skin problem itch? ☐ No ☐ Yes

VMC #30.3 (Rev. 12/09) **DERM HISTORY FORM** **(Please fill out both sides)**

Figure 1.1 Dermatology patient history questionnaire. *Source:* Reprinted by permission of the Veterinary Medical Center, University of Minnesota.

34) Does your pet lick? ☐ No ☐ Yes
If YES, location and frequency _____
35) Does your pet chew? ☐ No ☐ Yes
If YES, location and frequency _____
36) Does your pet rub? ☐ No ☐ Yes
If YES, location and frequency _____
37) Does your pet scratch? ☐ No ☐ Yes
If YES, location and frequency _____
38) Does your pet shake its head frequently? ☐ No ☐ Yes
39) Is there odor coming from the ears? ☐ No ☐ Yes
40) Is there discharge coming from the ears? ☐ No ☐ Yes
41) Does your pet scoot his/her rear end? ☐ No ☐ Yes
42) Is this problem seasonal? ☐ No ☐ Yes ☐ Unknown
If YES, which seasons?
☐ Spring ☐ Summer ☐ Fall ☐ Winter
43) Is this problem year-round? ☐ No ☐ Yes ☐ Unknown
If YES, which season(s) is/are worse?
☐ Spring ☐ Summer ☐ Fall ☐ Winter
44) Has you pet been allergy tested? ☐ No ☐ Yes
If YES, was it a: ☐ Skin test ☐ Blood Test ☐ Both skin & blood test ☐ Unknown
If YES, has your pet been on allergy shots? ☐ No ☐ Yes
If YES, response to allergy shots _____
45) Has your pet been on a food trial? ☐ No ☐ Yes ☐ Unknown
If YES, which food? _____
Response to food trial _____
46) Duration of food trial? _____
47) Was any chewable medication (including heartworm) given during food trial? ☐ No ☐ Yes
48) Number of bowel movements per day? _____
49) Fleas/Lice/Ticks/other parasite problems in the home? _____
50) Flea and Tick control products? (Type/freq) _____
51) How often do you bathe your pet? _____
52) What kind of shampoo and conditioners are used? _____
53) What improves skin condition? _____
54) Percentage time spent indoors? _____ %
55) Other pets in the household? ☐ No ☐ Yes
If YES, include species? _____
56) Exposure to other animals outside of household? ☐ No ☐ Yes
57) Any other animals in the household affected? ☐ No ☐ Yes
58) Any humans in the household affected? ☐ No ☐ Yes
Please list any other questions or concerns _____

VMC #30.3 (Rev. 12/09) **DERM HISTORY FORM** **(Please fill out both sides)**

Figure 1.1 (Continued)

which diseases may be more likely to affect them. Examples of important questions to ask the owner of a pet with dermatological signs include: Is the pet itchy? When did they first notice the problem? How has it changed over time? If they have been seen elsewhere for the skin problem, what diagnostic tests have been performed? What medications and treatments have been tried? What has worked for the patient and what hasn't? Is the pet taking any current medications (including over-the-counter products)? Did the medication help to improve the skin lesions and/or reduce the pet's itching? What is the pet's dietary history (including treats)? Is this a seasonal or non-seasonal problem? Are there other pets in the household and if so, are they showing similar signs? Are any humans in the household affected? Good communication and listening skills are essential to obtaining an accurate history.

It is helpful to start at the beginning and get a chronological sequence of events. This can be challenging, as the client may not think that the past information is relevant and may only want to discuss the current issues. Patience and persistence are often required in order to obtain the complete history. And sometimes it is necessary to ask the questions differently in order to get accurate information. For example, you may notice that the dog has alopecia and saliva staining on the paws. You assume the dog has been licking or chewing at his feet. You ask the owner if the dog is itchy (knowing that pruritus can be exhibited by scratching, licking, chewing, or rubbing behavior). The client may only think of scratching as a sign of itching, and will answer "no" to your question. You may then need to ask the client specific questions such as: Have you observed your dog licking, chewing, rubbing, or scratching? If the answer is yes, follow-up questions to ask include: What areas of the body, how often does this occur, and how intense is the licking, chewing, rubbing, and scratching? Each response should be documented in the medical record. You can also ask the client to rate their pet's level of pruritus on a numerical scale of 0–10 (with 0 being none to 10 being constant itching). Providing clients with a visual analog scale (VAS) that includes behavioral descriptions of pruritus can help standardize owner responses (Bergvall 2012, http://www.cliniciansbrief.com/sitesDefault/files/CaninepruritusScale.pdf). The VAS may be more sensitive (Miller et al. 2013) than the numerical scale. This pruritus score can be used to compare the patient's progress at follow-up visits. Pruritus is often the presenting complaint, especially if the pet sleeps in the owner's bedroom and is keeping them awake at night.

Collecting a thorough history can be time consuming, and the veterinary hospital may want to allow additional time for these appointments. Ideally, the person with the most knowledge about the patient should be the person present for the exam. This should be explained to the client when they are scheduling the appointment. A comprehensive history can help the veterinarian develop the most efficient and cost-effective diagnostic and treatment plan for the patient.

Dermatological Procedures

In order to make a diagnosis, the patient history, physical examination findings (see Figure 1.2), and diagnostic tests are used. It is often the veterinary technician's job to perform the diagnostic testing and it is important that the procedure be performed correctly. Keep in mind that a negative test result does not always rule out a disease. The following procedures are often performed on the dermatology patient.

Flea Combing

This technique is used to look for fleas and/or flea dirt (flea feces) if fleas are not found visually on physical exam.

Procedure (Figures 1.3–1.6):

1) Using an ultra-fine flea comb, comb the pet's hair coat thoroughly. You may get lucky and find the adult flea! If not:

a) Place the collected debris on white paper.
b) Wet the debris with water and look for a reddish tinge that indicates dried blood. If positive, this reddish tinge could be from either flea feces or a crust. The next step is to examine the debris microscopically to determine if the debris is flea feces (flea feces are comma shaped).

DERMATOLOGY EXAM

University of Minnesota
Veterinary Medical Center

Date				Student/Tech
Attending Clinician				Diagnostic/Recheck (circle)
Wt (*Kg/Lbs*)	Temp	Pulse	Resp	Time since last exam

Place Patient Label Here

Progress: Improved Worsened Static

Main Complaint: _____

Problem Started: _____

Progression: _____

_____ Other: _____

_____

FeLV: + – unknown **FIV:** + – unknown

Therapies: (oral / topical)

- Previous _____
  - Response _____
- Current _____

  _____
  - Response

Pruritus: (circle) Licking Chewing Rubbing Scratching Reporter: _____

Pruritus Visual Analog Scale: _____ Observer: _____

☐ Year-round worse: S SU F W ☐ Seasonal: S SU F W

Allergy Shots: Previously Currently Never Response: + – Unknown

Food Trial: Currently Yes No Trial Diet: _____ Response: + – Unknown

Duration: _____ Strict Trial: Yes No # of Bowel movements/day: _____

Diet: (Including treats & snacks) Current _____

Current on HW medication: Yes No Chewable Nonchewable

Environment: _____ % time spent indoors _____ outdoors _____ Swims: + –

Amount of contact with: Grass _____ Wool _____ Cement _____ *[none=1, rare=2, some=3, alot=4]*

Exposure to other animals? Dog + – Cats + – Others _____

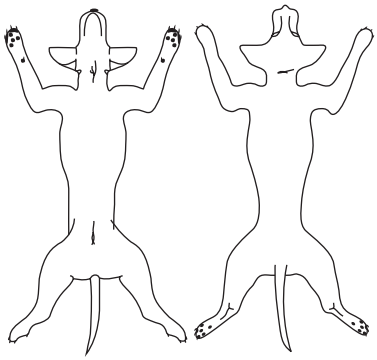
Others affected? Dog + – Cats + – People + –

Flea Control:

VMC #30.2 (rev. 12/09) **Dermatology Exam**

Figure 1.2 Dermatology physical exam form. *Source:* Reprinted by permission of the Veterinary Medical Center, University of Minnesota.

Physical Exam:



Problem	Rule Out	PLAN Dx	PLAN Rx

Diagnostic Procedures: _____

Cytology: Ear _____

Skin _____

Trichogram: _____

Skin scrapings: _____

FNA: _____ **Cultures**: Yes _____ No **Biopsy**: Yes No

Clinical Diagnosis _____

_____

_____

Figure 1.2 (Continued)

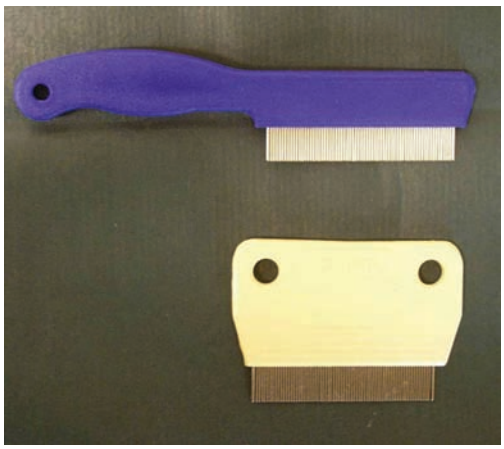


Figure 1.3 Flea combs.

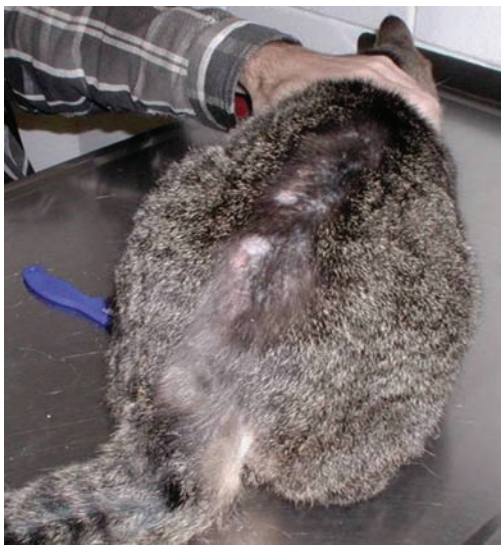


Figure 1.4 Cat with alopecia along dorsal lumbosacral area.

Figure 1.5 Flea excrement, often referred to as "flea dirt."

Figure 1.6 Microscopic view of flea feces.

Ear Cytology/Swab

This procedure is used to identify yeast and bacteria. Always swab both ears even if only one ear appears to be affected. Bacterial organisms can be identified morphologically as cocci or rods. *Malassezia pachydermatis* is the most common fungal organism present in ears. The budding yeast usually appears as a peanut or footprint shaped form. Make sure you examine cytology before adding any products into the ears in case a bacterial culture and susceptibility test is indicated.

Procedure when looking for bacteria and yeast (Figures 1.7–1.13):

1) Gently pull up on the ear pinna (see Chapter 4 for an ear diagram) to straighten out the ear canal and insert a cotton-tipped applicator swab into the bottom of vertical ear canal and rotate.
2) Roll the swab onto a labeled microscope slide and heat fix if this is standard for your practice.
3) Stain with Diff-Quik® or new methylene blue.
4) Examine microscopically under an oil immersion lens, 100×. Be sure the microscope is set so the light is up, the condenser is up and open, and the contrast is low. This will allow for the best viewing of yeast and bacteria. These settings should be employed anytime your subjects are cells or infectious agents. (Note: If you are not finding much on the slide, look for epithelial cells with evidence of bacteria and yeast.)

Figure 1.7 Gently pulling up on earflap, insert swab to bottom of vertical ear canal and rotate.

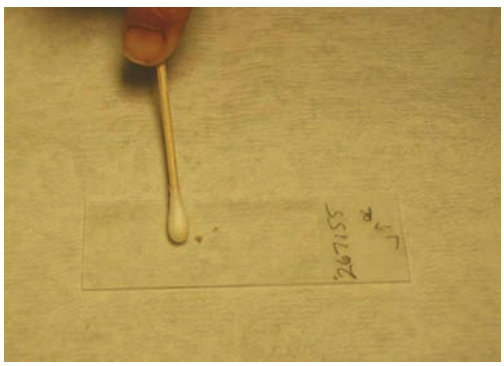


Figure 1.8 Roll swab onto labeled microscope slide.

Figure 1.9 Diff-Quik stains. *Source:* Courtesy of Judy K. Lethbridge, CVT, Veterinary Dermatology Center, Maitland, FL.

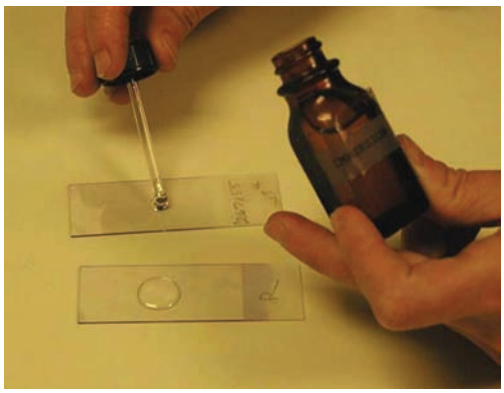


Figure 1.10 Add immersion oil to the stained slide and examine microscopically under an oil immersion lens, 100×.

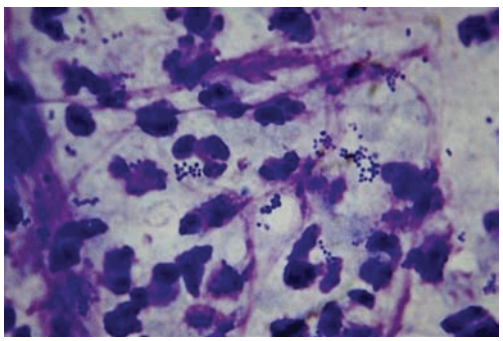


Figure 1.11 Cytologic examination of smear demonstrating cocci bacteria.

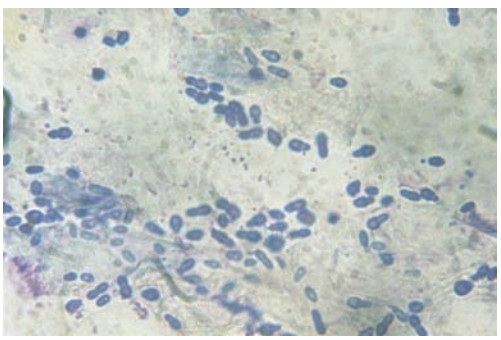


Figure 1.12 Cytologic examination of smear demonstrating *Malassezia* yeast.

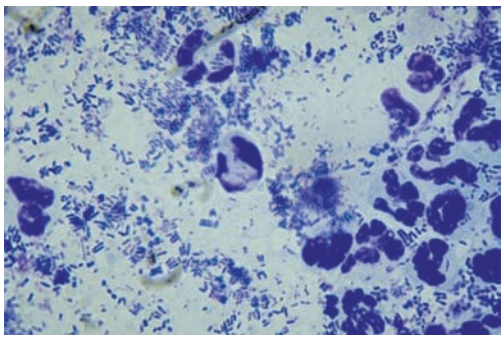


Figure 1.13 Cytologic examination of smear demonstrating rod bacteria.

Samples collected for bacterial culture should follow step 1 above, utilizing sterile swabs and aseptic technique.

Procedure when looking for *Otodectes/Demodex/Sarcoptes* mites and/or eggs (Figures 1.14–1.17):

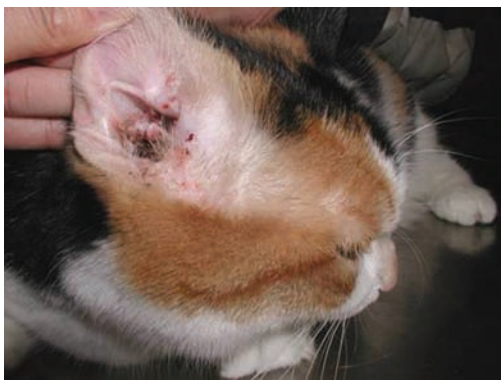


Figure 1.14 Cat with classic coffee ground appearance of discharge due to infestation of ear mites. Excoriations likely from scratching are also noted on the pinna.

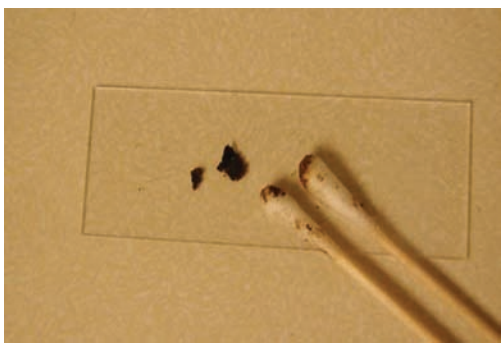


Figure 1.15 Close up of ear debris collected by swab.

Figure 1.16 Adult *Otodectes* mite.

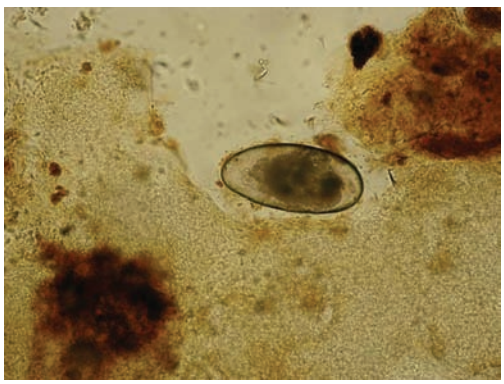


Figure 1.17 *Otodectes* egg.

1) Apply a few drops of mineral oil into the ears and onto a microscope slide.
2) Moisten a cotton swab with mineral oil.
3) Insert the swab into the ear canal and collect debris.
4) Place the collected material in the mineral oil on the microscope slide.
5) Apply a coverslip (if desired) and examine microscopically under 4× or 10×. For the best visualization of mites, set the microscope so the light is low, the condenser is down and closed, and the contrast is increased. These settings should be employed anytime your subjects are parasites.

Skin Cytology

Skin cytology is an underused diagnostic test that is easy to perform, relatively quick and inexpensive, and can provide a wealth of information. The following techniques can be used.

Tape Prep (Especially Useful for Finding Yeast on the Skin)

Procedure (Figures 1.18–1.23):

1) Use clear sticky tape.
2) Firmly press the sticky side onto the skin area to be sampled and vigorously rub the back of the tape. Use one of the staining method options below:

Figure 1.18 Clear, one-sided sticky tape.

Figure 1.19 Press sticky side onto skin area to be sampled and vigorously rub back of tape.

Figure 1.20 Stain tape with a third (purple) stain of Diff-Quik. *Source:* Courtesy of Judy K. Lethbridge, CVT, Veterinary Dermatology Center, Maitland, FL.

Figure 1.21 Apply immersion oil to microscope slide.

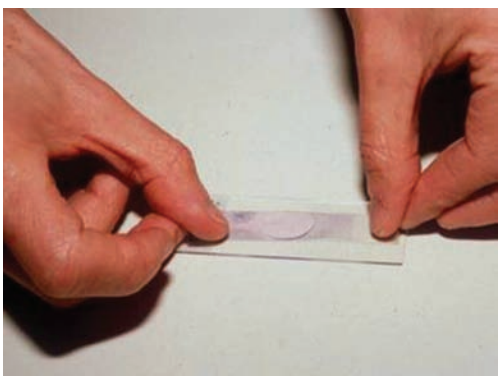


Figure 1.22 Put stained tape sticky side down.

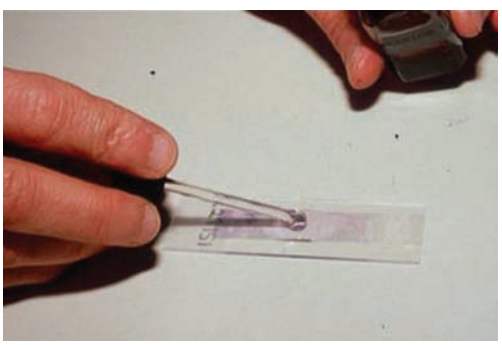


Figure 1.23 Apply immersion oil on top of tape and examine microscopically under an oil immersion lens, 100×.

3a) Stain the tape with a third (purple) stain of Diff-Quik. Rinse the tape and gently blot dry on a paper towel. Apply immersion oil to the microscope slide and put the tape sticky side down.

3b) Apply a drop of new methylene blue stain to the slide and put the tape sticky side down.
4) Apply immersion oil on top of the tape and examine under an oil immersion lens, 100×. (Note: You may want to scan the slide on low power to find areas of interest before applying immersion oil.)

Alternate methods:

1) A dry, dull scalpel blade or scraping spatula can also be used to gently scrape oily or moist skin surfaces to obtain a sample. Collected material is placed on a slide, heat fixed (if standard for your practice), and stained with Diff-Quik (Figures 1.24–1.26).
2) Cotton-tipped applicator swabs can be used to collect samples from oily or moist skin surfaces that are difficult to access, such as interdigital areas, facial folds, and tail folds (Figures 1.27 and 1.28).

Figure 1.24 Alternatives to tape prep technique include using a dry scalpel blade or spatula to collect the sample.

Figure 1.25 A dry #10 scalpel blade is used to carefully scrape the skin surface to collect skin cytology.

Figure 1.26 A dry spatula is used to gently scrape the skin surface to collect skin cytology.

Figure 1.27 Oily or moist skin surfaces that may be difficult to access to collect cytology include interdigital areas and facial folds.

Figure 1.28 Cotton swab used to collect sample from the nasal fold of an English bulldog.

Figure 1.29 Gently break open a pustule with a 25 gauge needle.

Figure 1.30 Press a microscope slide onto the ruptured pustule to collect a sample.

Sampling a Pustule

Procedure (Figures 1.29 and 1.30):

1) Gently break open a pustule with a 25 gauge needle.
2) Press a microscope slide onto the ruptured pustule.
3) Allow the sample to air dry or heat fix.
4) Stain with Diff-Quik.
5) Examine under an oil immersion lens, 100×.

Samples collected for bacterial culture follow step 1 above, utilizing sterile swabs and aseptic technique.

Sampling a Crust

Procedure (Figures 1.31 and 1.32):

Figure 1.31 Chow Chow with facial crusts. Gently lift up a crust and press a microscope slide onto exposed skin, or press the undersurface of the crust onto the slide.

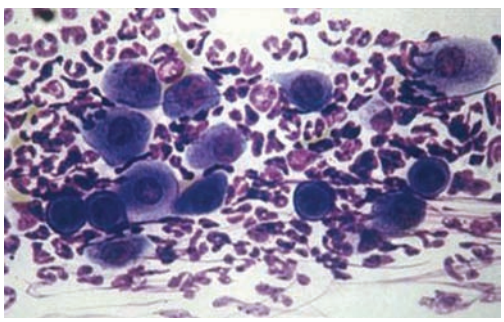


Figure 1.32 Cytologic examination showing acantholytic cells (large round cells) suggestive of the autoimmune disease pemphigus.

1) Gently lift up the crust.
2) Press a microscope slide onto the exposed skin or press the undersurface of the crust onto the slide.
3) Allow the sample to air dry or heat fix.
4) Stain with Diff-Quik.
5) Examine under an oil immersion lens, 100×.

Skin Scraping

Different techniques are used depending on which mite you are searching for. A good history will help determine which mites you should be suspicious of.

Sarcoptes scabiei and *Notoedres cati* (Feline Scabies)

Multiple superficial scrapings are needed; you may still only find sarcoptic mites approximately 20% of the time (Miller et al. 2013).

Procedure (Figures 1.33–1.37):

1) Put mineral oil on a microscope slide.
2) Either dip a #10 scalpel blade or a scraping spatula into oil or apply oil directly to the skin site. (Note: Prior to scraping, dull the scalpel blade to prevent accidentally cutting the patient.)
3) Pick an area that is crusty but not too excoriated or inflamed to scrape. Scrape a broad area about the size of your palm superficially.

Figure 1.33 Dog with sarcoptic mange. Skin lesions include erythema, alopecia, scaling, crusts, and ear margin fissures.

Figure 1.34 Ten-month Cocker Spaniel with sarcoptic mange. Patient was being treated for allergies after initial skin scrapings were negative.

(a)

(b)

Figure 1.35 (a) and (b) Scrape deep enough to get capillary oozing. Remember that multiple scrapings are needed. *Source:* Courtesy of Judy K. Lethbridge, CVT, Veterinary Dermatology Center, Maitland, FL.

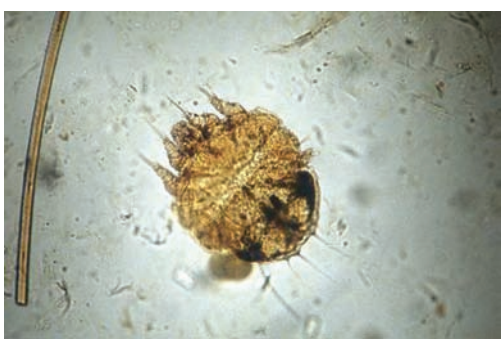


Figure 1.36 Skin scraping showing an adult *Sarcoptes* mite.

4) Put samples on labeled slides and apply a coverslip.
5) Examine the samples thoroughly under the microscope at 10× or 20×.

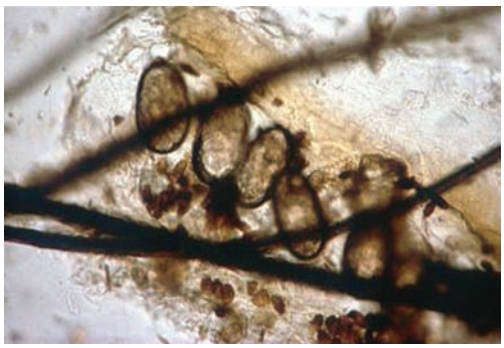


Figure 1.37 Skin scraping showing many *Sarcoptes* eggs and fecal pellets.

Demodex canis, Demodex cati, Demodex injai

Procedure (Figures 1.38–1.41):

1) Choose three to four sites to sample.
2) Put mineral oil on a microscope slide.
3) Either dip a dull #10 scalpel blade or scraping spatula in oil or apply oil directly to the skin site.
4) Squeeze the skin (to help extrude mites from the hair follicle).
5) Scrape deeply enough to get capillary oozing (blood should be evident on the slide).
6) Put samples on labeled slides and apply a coverslip.
7) Examine the samples thoroughly under the microscope at 10× or 20×. (Note: Lowering

Figure 1.38 Boxer puppy with generalized demodicosis. Skin lesions include alopecia, erythema, papules, pustules, and hyperpigmentation.

Figure 1.39 Scraping deep enough to get capillary oozing and squeezing the skin will help extrude mites from the hair follicle. *Source:* Dr. Sheila Torres, courtesy of the University of Minnesota, College of Veterinary Medicine.

Figure 1.40 Skin scraping showing adult *Demodex* mites (four pairs of legs).

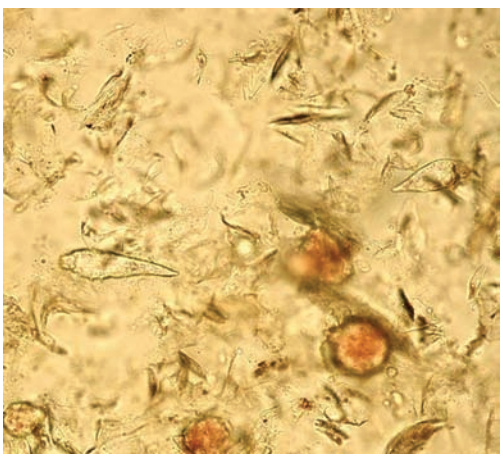


Figure 1.41 Skin scraping showing a larval stage (three pairs of legs) and an egg (fusiform shape) of *Demodex*.

Box 1.1 Example of Documenting Skin Scraping Results of the Demodex Mite Stages

Location: _____
Adults (alive):_____
Adults (dead):_____
Nymphs: _____
Larvae: _____
Eggs: _____

the microscope condenser to increase contrast will help with mite visualization.)

8) Count mites or at least record stages of mites found from each area scraped and document in the medical record (see Box 1.1). This information will be used to monitor the treatment response.

***Cheyletiella spp., Demodex cornei, Demodex gatoi, Lynxacarus radovsky,* Lice *(Linognathus setosus, Trichodectes canis, Felicola subrostratus,* etc.)**

Procedure (Figures 1.42 and 1.43):

1) Multiple samples are needed, and may still be difficult to find.
2) Put mineral oil on a microscope slide and use one or all of the following methods:
   a) Dip a dull #10 blade or scraping spatula in oil and do broad superficial skin scraping.
   b) Use clear tape, press onto the skin and scale (usually the dorsal area for *cheyletiella*).

Figure 1.42 Puppy with cheyletiellosis. Skin lesions include scaling over dorsum.

Figure 1.43 Spread the hair and use clear sticky tape to press onto the skin and scale. *Source:* Courtesy of Judy K. Lethbridge, CVT, Veterinary Dermatology Center, Maitland, FL.

   c) Flea combing to collect hair, scale, and debris.
3) Put samples on labeled slides and apply a coverslip.
4) Examine the samples thoroughly under the microscope at 10× or 20×.

Fecal Flotation

This technique can be used to look for *Cheyletiella spp*. and *D. gatoi* (feline) if skin scrapings are negative. These mites live superficially in the skin and can be ingested by the pruritic pet when it grooms itself (Figures 1.44–1.46).

Trichography

A trichogram can be used to look for fungal arthrospores in cases of suspected dermatophytosis; to determine the growth phase of the hair; to look for lice eggs, *cheyletiella* eggs, or *demodex* mites adhered to the hair; or to determine if the tips of the hairs are broken off.

Procedure (Figures 1.47–1.50):

1) Pluck suspicious hairs with a forceps in the direction of the hair growth.
2) Place hairs in mineral oil on a microscope slide and apply a coverslip.
3) Scan microscopically under low power and increase magnification as needed.

Figure 1.44 If skin scrapings are negative, fecal flotation may be used to look for *Cheyletiella spp*. and *Demodex gatoi* (feline). These mites live superficially in the skin and can be ingested by the pruritic cat. Alopecic feline patient with *D. gatoi*.

Figure 1.45 *Demodex gatoi*.

Figure 1.46 *Cheyletiella spp*. *Source:* Courtesy of Dr. Karen Moriello, Clinical Professor of Dermatology, School of Veterinary Medicine, University of Wisconsin-Madison.

Figure 1.47 To perform a trichogram, pluck suspicious hairs with a forceps in the direction of the hair growth.

Figure 1.48 Trichogram showing an infected hair with arthrospores.

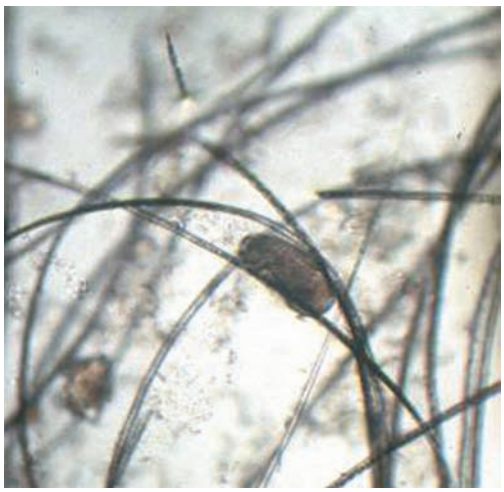


Figure 1.49 Trichogram showing a *Cheyletiella* mite egg.

Figure 1.50 Trichogram showing a *Demodex* mite adhered to the hair.

Dermatophyte Culture

A dermatophyte culture is often necessary to diagnose dermatophytosis. Dermatophyte test medium (DTM) is frequently used in private practice (Figure 1.51). This medium contains a phenol red indicator that may turn the medium red. This color change can occur with both dermatophytes and saprophytes (contaminants). Therefore, it is important to check these cultures daily or every other day to observe how soon color change and colony growth occur. Dermatophytes typically turn the media red much earlier than saprophytes, often within 7–10 days. The color change needs to occur prior to or in conjunction with colony growth to be significant.

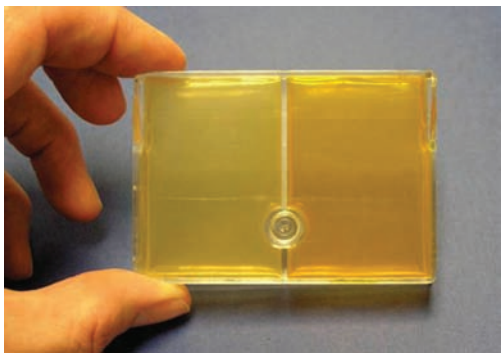


Figure 1.51 Example of a flat fungal culture bi-plate – dermatophyte test medium (amber color) and Sabouraud's dextrose agar.

Procedure:

1) Pluck suspicious hairs (broken or misshapen hairs; hairs associated with scale, crust, or inflammation; or hairs with positive fluorescence under a Wood's lamp) that are close to the edge of the lesion, or use the Mackenzie brush technique to collect hairs from clinically normal patients.
2) Gently press collected hairs onto DTM culture.
3) Incubate DTM in a darkened area at room temperature, ideally around 30° centigrade and 30% humidity (Miller et al. 2013).
4) DTM culture should be aerobic.
5) Keep culture for a minimum of three to four weeks before calling negative. (Note: Patients already on treatment for dermatophytosis may take longer to show growth on culture.)
6) Perform tape prep to identify a colony microscopically. (Note: If you have a suspicious colony that is in danger of being overgrown by a saprophyte, you can inoculate the suspicious colony onto a new DTM plate.)

Figure 1.52 Mackenzie Brush Technique-brushing cat with toothbrush.

Mackenzie Brush Technique

This technique is particularly useful for asymptomatic patients (including patients on treatment whose clinical signs have resolved).

Procedure (Figure 1.52):

1) Remove a new, unopened toothbrush from its package and brush the entire patient head to toe.
2) Pay special attention to collecting hair from face and ears.
3) Press the toothbrush with hairs gently onto DTM.
   a) You may need to remove hairs from the toothbrush with a needle, scalpel blade, or forceps.
   b) For ease of placing the hair sample onto DTM, it is preferred to use flat culture plates for this technique.

Tape Prep Procedure

A method used to identify colony growth on DTM.

Procedure (Figures 1.53–1.56):

1) Place a drop of lactophenol cotton blue or new methylene blue stain on a microscope slide.
2) Use clear, one-sided sticky tape.
3) Grab the tape with forceps and lightly press onto the colony.
4) Place the tape, sticky side down, on the slide and apply a coverslip.
5) For ease of collection, it is preferable to use flat culture plates for this procedure.
6) Examine under 10× and then 40× to identify macroconidia.

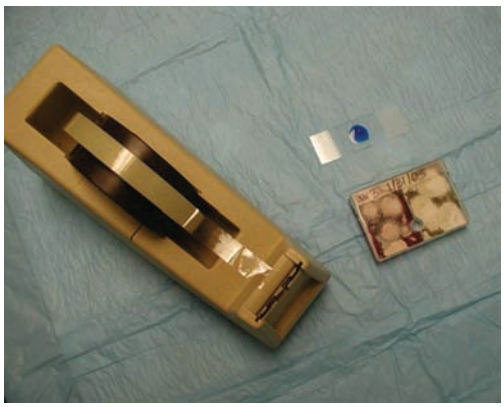


Figure 1.53 Supplies (sticky tape, stain, and dermatophyte test medium) for tape prep of colony growth.

Figure 1.54 Lightly press one-sided sticky tape onto suspicious colony.

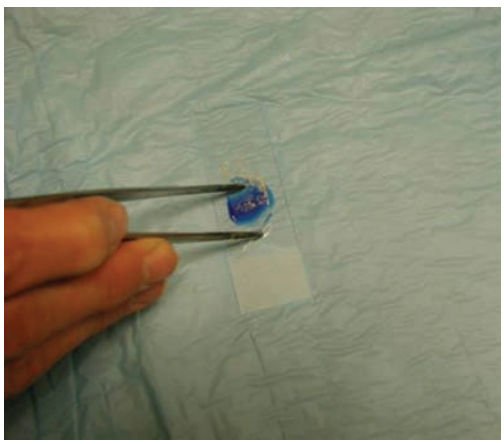


Figure 1.55 Press collected material on tape into stain on microscope slide.

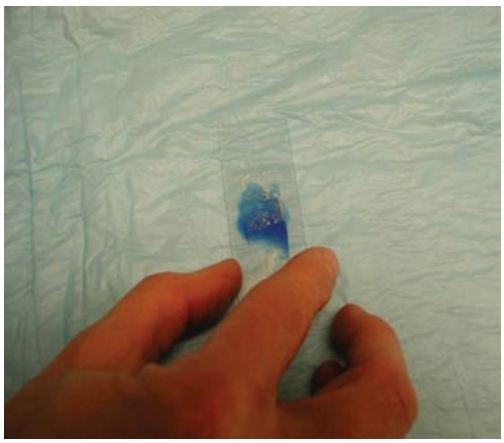


Figure 1.56 Apply coverslip.

Skin Punch Biopsy

Multiple biopsies should be taken and ideally sent to a dermatohistopathologist. Including the patient signalment, complete history, physical exam findings including type and location of skin lesions, list of differential diagnoses, and pictures (if possible) along with the submitted samples will help to obtain the correct diagnosis. Skin biopsies can often be obtained with local anesthesia only. However, some inflamed or deep lesions (e.g. panniculitis) do not block well with local anesthetic, so sedation or general anesthesia may be necessary as determined by the veterinarian.

Procedure (Figures 1.57–1.64):

1) The veterinarian indicates sites to be biopsied. Only affected skin should be

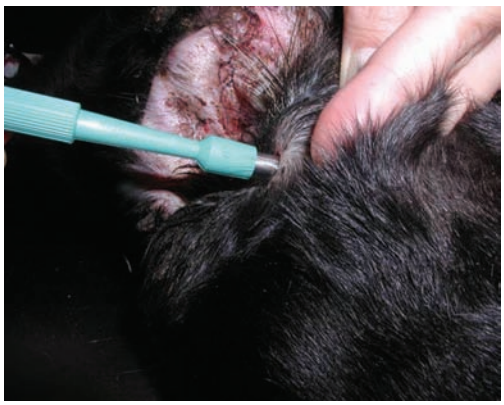
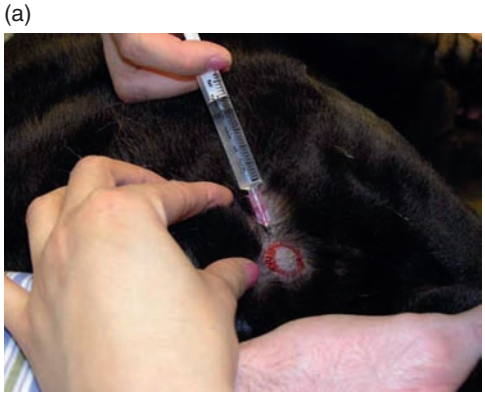


Figure 1.58 Gently press the biopsy punch over the site and begin to rotate the punch in one direction to collect the sample.

Figure 1.59 Continue rotating until you feel the punch go through the skin (depending on the thickness of the skin in the area you are sampling, the entire hub of the punch may be embedded).

(a)



(b)

Figure 1.57 (a and b) Injecting lidocaine subcutaneously under each biopsy site.

Figure 1.60 When deep enough, remove the punch and grab the sample gently with fingers. If you cannot use your fingers, then try gently stabbing the sample with a 25 gauge needle to lift the skin (using a forceps may crush the tissue).

Figure 1.61 Gently lift the sample and cut as deeply as possible with an iris scissor.

included. If normal skin is needed to be sent to the dermatohistopathologist, this sample should be marked as such and submitted in a separate container.

2) Inject 0.5–1.0 ml of lidocaine subcutaneously under each site (intradermal injection can cause artifacts in the sample).
   a) Do not exceed 1 ml per 5 kg body weight to prevent cardiac arrhythmias (Mueller 2004).
3) Wait a few minutes for lidocaine to take effect before beginning.

Figure 1.62 Dry the biopsy skin sample gently with gauze.

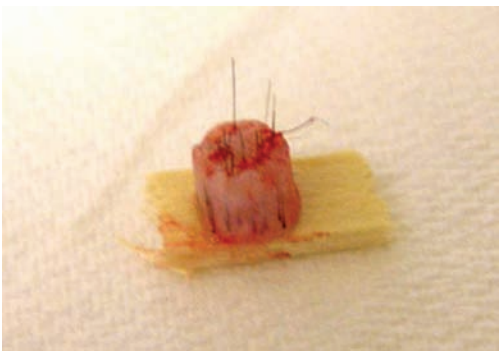


Figure 1.63 Place the sample hair side up on a piece of tongue depressor.

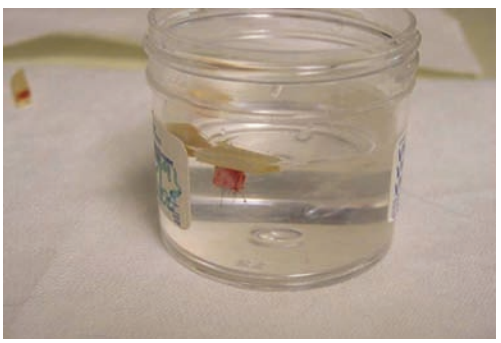


Figure 1.64 Put the sample hair side down in a jar of 10% buffered formalin.

4) **Do not** disturb the skin in any way prior to taking the biopsy. This includes shaving and scrubbing, as doing so can remove crusts which may be needed to make a diagnosis.

(Note: If the biopsy site is not alopecic, a scissors can be used to gently trim away excess hair to allow the biopsy punch to have closer contact with the skin.)

5) Usually a 4, 6, or 8 mm punch is used (6 or 8 mm preferred unless obtaining a sample from areas such as nasal planum or footpad). Tissue will shrink once placed in formalin.
6) Place the punch over the center of the lesion and rotate the punch in one direction to collect a sample.
7) When deep enough, remove the punch and grasp the sample gently with fingers (to avoid pinching or crushing of skin). If using forceps, gently grasp subcutaneous tissue rather than skin.
8) Gently lift up the sample and cut as deeply as possible with iris scissors.
9) Apply pressure with a gauze pad to the biopsy site as needed for hemostasis, then close with suture material.
10) Gently blot the underside of the biopsy sample on dry gauze.
11) Place the sample hair side up on a piece of tongue depressor (this allows the tissue orientation to be preserved for sample preparation at the histopathology lab).
12) Put the sample hair side down in a jar of 10% buffered formalin.

Skin biopsies may also be used to collect samples for aerobic and anaerobic bacterial and fungal cultures. For this procedure, the skin site is disinfected and samples collected aseptically and placed into the appropriate transport media. The laboratory should be contacted for specific instructions and materials for collection.

Client Education and Client Compliance

Patients with dermatological diseases can require a lot of at-home care. Owners who have a good understanding of their pet's disease are more likely to comply with therapeutic recommendations. For example, if the veterinarian prescribes a medicated antibacterial or antifungal shampoo to be used twice weekly, and the shampoo should have a 10–15 minute contact time, the technician should explain how this treatment will benefit the patient. If owners understand the process, they will be more likely to use the medicated shampoo as prescribed. This is how the author explains the allergic process to the owner: "When your dog eats or absorbs (either through the skin or inhalation) something it is allergic to, the skin becomes inflamed (you may notice pink or red skin). The skin may also become greasy and this inflammation and greasiness provide a great environment for bacteria and yeast. Because this inflamed skin is no longer a good barrier, the microorganisms that normally live on the skin surface are able to proliferate and cause an infection. The infection increases the level of itchiness. Using this medicated shampoo will decrease the number of microorganisms on the skin surface and hopefully will decrease the itching." Make sure the owner is aware that the shampoo is working while the pet is lathered up, so the veterinarian's recommended contact time is important.

Emphasize to the client the expectations of treatment. Does their pet have a disease that cannot be cured but only controlled? If curable, will the condition take a long time to reach a cure, and will the treatment involve a substantial time commitment and/or financial commitment from the owner? If the disease is only controllable, make sure clients understand that it may take some trial and error to establish the ideal treatment plan for each individual patient. Let them know that you will work together with them as a team to find out what treatment plan will work the best to make their pet the most comfortable.

Recheck appointments are critical to the successful management of each patient. Always recheck ear and skin infection patients prior to discontinuing antimicrobial therapy. The rule of thumb is to continue treatment of superficial infections for one to two weeks past clinical resolution of signs

(Koch et al. 2012; Miller et al. 2013). Deep skin infections will require longer treatment, a minimum of 4 weeks and often up to 12 weeks, and therapy should be continued for 2 weeks past clinical resolution of signs (Koch et al. 2012; Miller et al. 2013). Patients with parasitic skin diseases (especially demodicosis) as well as patients with dermatophytosis often look clinically normal before the condition is actually cured. Stopping treatment too soon will likely result in a relapse. Clients need to understand the importance of these rechecks so that they keep their appointments.

Some ectoparasite infestations can be prevented. It is much easier and less expensive to prevent ectoparasite infestations rather than paying to treat the primary condition along with all its secondary complications. Especially in regions that can support flea survival year round, dogs and cats with flea allergy dermatitis should always be on flea prevention. In addition, since many diseases such as tapeworms, babesiosis, anaplasmosis, and ehrlichiosis can be transmitted to our pets by fleas and ticks, ectoparasite control is an important aspect of maintaining overall patient health. It is likely the veterinary technician will be involved in educating clients and assisting them in choosing a preventative product for their pet. Improving clients' knowledge about fleas and setting realistic owner expectations is a very important factor in achieving success with flea control (Dryden 2009). Veterinary technicians who educate the client and set realistic expectations can be a valuable asset to the veterinary practice.

Many skin conditions have underlying causes, which will be important to investigate if the problem continues to recur. Mentioning this to the client and letting them know that further diagnostic tests or a referral to a dermatologist might be indicated in the future may help prevent a client from becoming frustrated and dissatisfied with the veterinary care their pet received at your practice.

Helpful Hints to Improve Client Compliance

Capsules and Tablets

- For oral administration with capsules directly into the back of the mouth, wetting the capsule with water will help it slide down easier (rather than sticking to your finger).
- When possible, giving clients the choice of treating their pet with once- or twice-daily antibiotic medications and explaining the cost difference may help improve compliance.
- Often, oral medications are hidden in food, which can be a challenge when the patient is on a food trial. If a canned version of the prescription food trial diet is not available, some options are canned pumpkin, baked potato, oatmeal, and cooked sweet potato. Allergy formula pill pockets may also be an option.

Injections

For patients who dislike receiving their immunotherapy injections:

- Rotate rooms that the injection is administered in.
- Place pet on a table or a slippery surface like a washer/dryer to give the injection (ensuring the patient is safe from falling or jumping off).
- Use positive reinforcement – giving treats during and after the injection. (Note: Putting canned food onto the floor, table, or a plate for them to lick while receiving an injection can be a good distraction in a patient that is not food aggressive.)
- After drawing the allergen dose into the syringe, warm the syringe to room temperature prior to injection.
- Practice pinching up skin and then reward the pet for holding still.
- Practice getting the syringe out and with the cap on pretend to give an injection.
- Remind the owner to remain calm and relaxed, as pets can sense the owner's nervousness.

- Offer to have the veterinary technician administer injections at no charge or for a nominal fee.

Bathing

- Ensure the floor of the bathtub or shower is not slippery by using rubber bath mats.
- Use lukewarm water – inflamed skin is warm and cooler water will be soothing.
- If the patient is dirty, have the client bathe the pet first with a mild shampoo to remove dirt, then use a medicated shampoo.
- If medicated shampoo is thick, dilute with water in a squeeze bottle; this will provide a more even lather of shampoo throughout the hair coat.
- Avoid applying a large amount of shampoo to the dorsal midline to spread from there. Instead, apply a small amount of the shampoo onto hands and then massage into various locations to get an even application to the pet's haircoat.
- Have the client start lathering the most affected area of skin first, then lather up the rest of the body and begin timing the recommended amount of contact time.
- Gently massage shampoo into the skin. Avoid vigorous scrubbing to prevent irritation of already inflamed skin.
- Read a book out loud while waiting to rinse the pet (this may calm the dog to sit still in the tub).
- Use positive rewards (such as feeding treats) while the dog is in the tub.
- If bathing outside, play with the dog or take them for a walk while they are lathered up.
- **Always** rinse thoroughly – when the client thinks they have removed all the shampoo, rinse one more time just to be sure!
- Offer therapeutic bathing services in your hospital.
- Refer client to a self-service dog wash or groomer.

Ear Cleaning

- Demonstrate the proper ear cleaning technique during the appointment (after demonstrating one ear, have the client clean the other ear while you observe).
- Cover the patient with a towel when flushing and massaging ears (keeping the pet clean may increase compliance).
- Grab the ear flap along with the collar when filling the canal to stabilize the patient's head.
- Fill both ears at once to prevent head tilting and then massage.
- For pets that don't tolerate filling the ear canal with solution, have the client saturate a cotton ball with ear cleaner and place into the ear canal, then squeeze the cotton ball to get the cleaner in.
- Some pets may tolerate lying on their side rather than being in a sitting or standing position.
- Warm the ear cleaner solution prior to applying in the ears.
- Use hypoallergenic baby wipes or antimicrobial wipes to clean the ear flap.

Handouts

Handouts are a great way to reinforce what has been explained to the client in the exam room.

- Create handouts for the different diseases and then include the patient's specific recommendations on the back.
- Give clients the handouts to read while you are looking at cytology and skin scrapings, and then answer any questions they have when you come back in the room.
- Having handout templates on the computer that can be customized for each patient's discharge instructions is very efficient.

Recheck Appointment Options

- Schedule the recheck appointment at the end of the initial exam, and give the client a reminder card with the appointment date and time.
- Call the client one to two days after the exam to see how the pet is doing and then schedule the appointment.
- Create a recall list and callback reminders to schedule the recheck.

- Mail out reminder cards when the patient is due and/or after the client has scheduled the recheck appointment. Email or text messages may be preferred by some clients.
- Call the client two days prior to the appointment for confirmation. Sometimes the client may want to cancel their appointment because the pet is better. This is another opportunity for the veterinary technician to educate the client. For example, in the case of a skin or ear infection, the intent was that the patient would respond favorably to treatment; however, the purpose of the recheck is for the veterinarian to repeat cytology and assess how much longer the treatment needs to be continued. If you convince the client to come for the recheck, but the client needs to reschedule to a later date, the patient should receive additional medication to last until the next appointment.

Phone Calls

- Make follow-up phone calls midway through a diet trial.
- Check in with the client when their pet is on a decreasing dose of steroids.
- Give reminders when the patient is due for lab work (especially for patients on long-term corticosteroid or cyclosporine therapy).
- Patient updates: Ensure clients are following discharge instructions correctly. Bring any problems or concerns to the veterinarian's attention if the patient is not doing well.

Conclusion

As a veterinary technician you play a vital role in the management of dermatology patients. Obtaining an accurate history and performing diagnostic procedures correctly are extremely important. Providing thorough client education about the diagnosis and therapeutic recommendations made by the veterinarian is crucial to ensuring client compliance. These fundamental elements are essential for the successful management of the dermatology patient.

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