

INCREASE ACCESS Streamlining the diagnostic process or creating a treatment trial based on a tentative diagnosis can be helpful for clients who face financial barriers.

INSIGHTS IN DERMATOLOGY

Diagnosing Common Skin Conditions of Dogs and Cats in Community Medicine Practice

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In veterinary medicine, there is a need to rapidly reach correct diagnoses in a timely and cost-effective manner. This need is especially felt by veterinarians working in communities with barriers to care, including those in low-income and/or remote regions, termed “community medicine” practice. However, information and pertinent studies to guide veterinarians in a direct and efficient spectrum-of-care process for diagnosing dermatologic conditions are lacking. This article provides suggestions for efficient diagnostic approaches, especially for community medicine practitioners (**FIGURE 1**).

HISTORY

The first step for reaching an accurate dermatologic diagnosis is obtaining a thorough history. A good history may reduce the number of diagnostic procedures needed and provide context for interpreting results. Although taking a complete history can be time-consuming, the process can be streamlined by giving clients a questionnaire to complete before or while waiting for their appointment (**FIGURE 2**). Questionnaires standardize questions and responses and

may rapidly indicate where further exploration is needed. For clients in underserved and often marginalized communities, limitations to completing questionnaires may include their health literacy and language fluency. Therefore, basic phrasing should be used and leading questions avoided. Handouts should be written at no more than 6th-grade reading level.¹ Translating the questionnaires into commonly used languages will also make them more accessible to a variety of clients. Having staff members verbally translate or read the questionnaire aloud may be helpful for clients with limited vision; clarifying questions can also be useful.

The main categories of questions are as follows:

- **Signalment:** Patient’s breed, age, sex, and neuter status can influence prioritization of differential diagnoses.
- **Pruritus level:** It is helpful to inform clients that biting, scratching, licking, chewing, and rubbing may all be signs of pruritus as clients may think that the only indicator of pruritus is scratching. Quantifying pruritus on a scale of 0 to 10 is helpful for determining severity. Nonpruritic conditions include endocrinopathies, dermatophytosis, and demodicosis;



however, pruritus may accompany some of these conditions, particularly in cats, or when secondary infections are present. Variable pruritus is typically seen with other ectoparasitic diseases, bacterial infections, *Malassezia* dermatitis, or allergies.

- **Ectoparasite control:** Useful information includes the type of ectoparasite control used, frequency of application/administration, and duration of application/administration. If the patient is receiving an oral flea preventive containing only the insect growth regulator lufenuron, adult fleas may still be present, resulting in a hypersensitivity reaction.²

Conversely, if the patient has been receiving a flea and tick preventive containing an isoxazoline (e.g., afoxolaner, fluralaner), *Demodex* and *Sarcoptes* mite infestations are less likely.^{3,4}

- **Environment and travel:** Asking “what percentage of time does the animal spend outside” avoids the perception that “indoors” is the correct answer to a question about the patient’s environment. Travel history can also lead to inclusion of disease conditions not commonly found in clients’ current geographic area.
- **Progression, response to therapy, and seasonality:** Key information for creating a differential list and

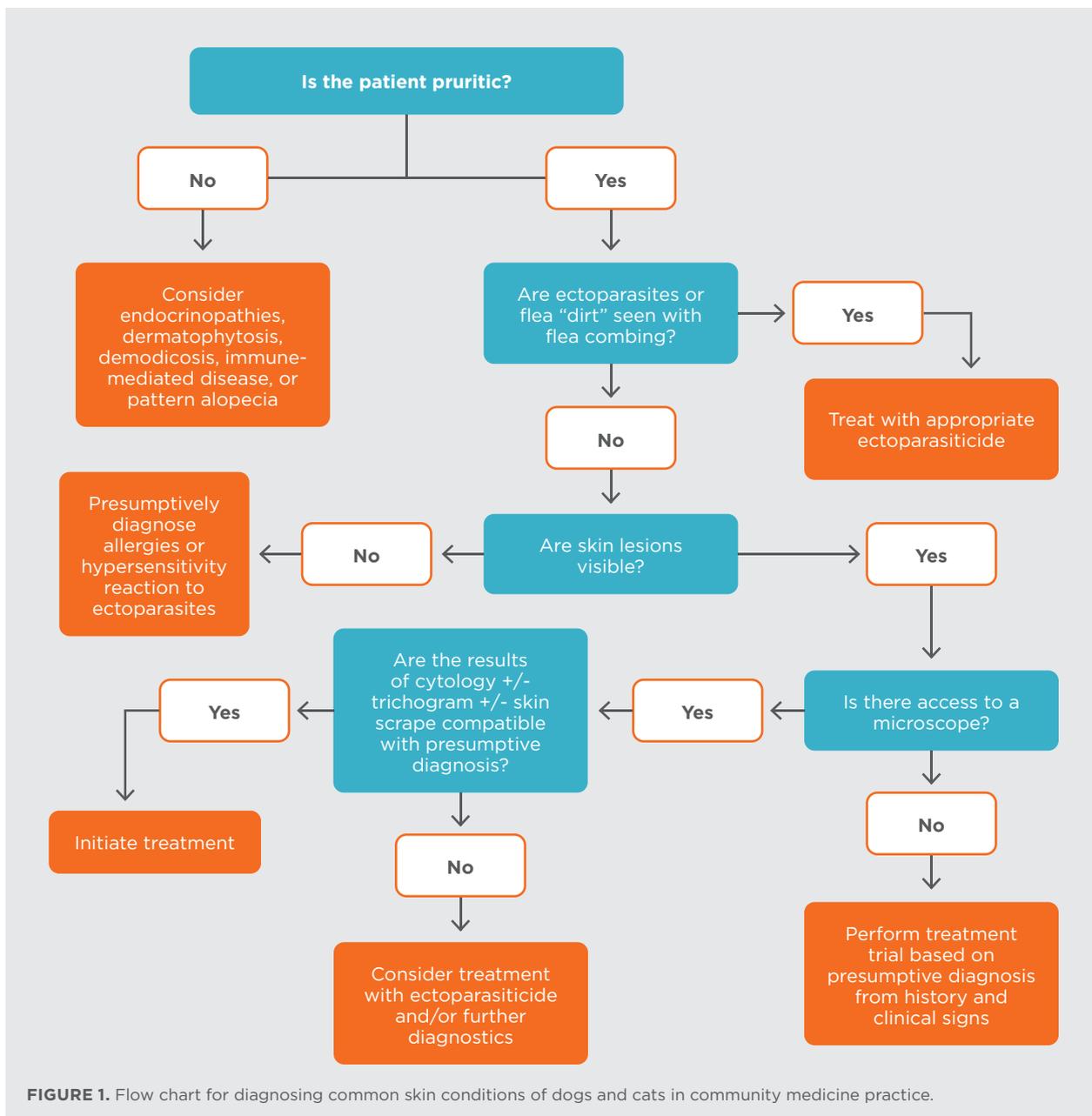


FIGURE 1. Flow chart for diagnosing common skin conditions of dogs and cats in community medicine practice.

Name of pet: _____ Breed: _____

Age: _____ Sex: _____ Male _____ Female

Is your pet: _____ Spayed _____ Neutered _____ Intact _____

Primary concern: _____

Is your pet itchy (including scratching, biting, licking, chewing, rubbing, and head shaking)? _____ Yes _____ No

If yes, on a scale of 0 (not at all) to 10 (very itchy), how itchy is the condition? _____

If yes, where on their body does your pet itch? _____

What percent of time does your pet spend: _____ % Indoors _____ % Outdoors

Does your pet have contact with any other animals? _____

If yes, which and where? _____

Does your pet travel? _____ Yes _____ No If yes, where and when? _____

Do other animals or people in the household have a similar problem? _____

Do you use flea/tick medications for your pet? _____ Yes _____ No

If yes, which product do you use? How frequently? Last application? _____

What does your pet currently eat (including treats)? _____

Have you fed them other foods (including treats)? _____

Where did the skin problem start? _____

_____ Face _____ Paws _____ Back _____ Tail

_____ Ears _____ Legs _____ Stomach Other: _____

What happened when the skin problem first started? _____

_____ Itching _____ Redness _____ Discharge _____ Small Bumps _____ Crusting _____ Rash

_____ Hair Loss _____ Smell _____ Pimples _____ Large Bumps _____ Dandruff

Other: _____

Age of pet when you first got it: _____ Age when skin problem first started: _____

Does the skin problem happen all year-round? _____ Yes _____ No

Did the problem start off only happening during some parts of the year? _____ Yes _____ No

Are there times of the year when the problem is worse? If so, which? _____

How has the problem changed over time? _____

What treatments has your pet gotten for the skin problem? _____

Have any helped? _____ Yes (if so, please circle the ones that helped) _____ No

Does your pet have any of the following?

_____ Vomiting/throwing up _____ Drinking more _____ Sneezing

_____ Diarrhea _____ Peeing more _____ Runny eyes

_____ Change in eating _____ Coughing Other: _____

FIGURE 2. Sample questionnaire for clients with dermatologic pets.



informing treatment decisions includes the duration of lesions, lesion initial appearance, whether pruritus or lesions occurred first, and seasonality of the condition.

- **Other animals or humans affected:** Although human and animal responses to infections and ectoparasites vary, if another in-contact animal or human is similarly affected, communicable differentials must be prioritized.
- **Diet:** If a cutaneous adverse food reaction or nutritional deficiency is suspected, information about past and current foods is relevant.
- **General health:** Although many dermatologic conditions are confined to the skin, some are associated with systemic disease. For that reason, assessing the overall health of the patient is essential.

CLINICAL SIGNS AND DISTRIBUTION

Despite overlap between clinical signs and distribution of different dermatologic lesions, a tentative diagnosis can often be made based on history and clinical appearance alone. In community medicine settings, cost, time, and other limitations sometimes indicate that treatment must be based on clinical diagnosis alone. For that reason, knowledge about common lesions and disease patterns is helpful (TABLE 1).

Ectoparasites

Fleas: Fleas or flea dirt may be visible to the naked eye. However, they are not always found on patients with hypersensitivity reactions.⁵ Flea combing should be performed on every pruritic dog and cat. Skin lesions and pruritus related to flea hypersensitivity are most

TABLE 1 Common Lesions and Commonly Associated Conditions

LESION	DESCRIPTION	ASSOCIATED CONDITIONS	
		INFECTIOUS	STERILE
Hypotrichosis/alopecia	Loss to absence of hair	<ul style="list-style-type: none"> ■ Superficial pyoderma ■ Dermatophytosis ■ Demodicosis 	<ul style="list-style-type: none"> ■ Endocrinopathy ■ Follicular dysplasia ■ Hair cycle arrest ■ Trauma (self-induced) ■ Vascular damage ■ Immune-mediated disease ■ Neoplasia
Pustule	A raised, discrete lesion visibly containing purulent material	<ul style="list-style-type: none"> ■ Superficial pyoderma ■ Dermatophytosis 	<ul style="list-style-type: none"> ■ Pemphigus foliaceus ■ Juvenile cellulitis
Papule	Raised, solid, discrete lesion ≤1 cm in diameter	<ul style="list-style-type: none"> ■ Superficial pyoderma ■ Dermatophytosis ■ Demodicosis ■ Ectoparasite hypersensitivity 	<ul style="list-style-type: none"> ■ Miliary dermatitis ■ Hypersensitivity/allergic reaction ■ Neoplasia
Nodule	Raised, solid, discrete lesion >1 cm in diameter	<ul style="list-style-type: none"> ■ Deep pyoderma ■ Dermatophytosis ■ Other fungal infection ■ Demodicosis 	<ul style="list-style-type: none"> ■ Neoplasia ■ Immune-mediated disease ■ Foreign body reaction ■ Calcinosis cutis/circumscripta
Draining tract	Tract lesion emitting serous, serosanguineous, or purulent exudate associated with a large foci of inflammation, most commonly associated with a nodule	<ul style="list-style-type: none"> ■ Deep pyoderma ■ Dermatophytosis ■ Other fungal infection ■ Demodicosis 	<ul style="list-style-type: none"> ■ Neoplasia ■ Sterile nodular panniculitis ■ Foreign body reaction ■ Calcinosis cutis/circumscripta ■ Juvenile cellulitis
Crust	Accumulation of skin cells, exudate, medication, or other material on the skin	<ul style="list-style-type: none"> ■ Ectoparasites ■ Superficial and deep pyoderma ■ Dermatophytosis ■ <i>Malassezia</i> dermatitis 	<ul style="list-style-type: none"> ■ Trauma ■ Immune-mediated disease ■ Pemphigus foliaceus ■ Vasculitis ■ Nutritional deficiencies
Epidermal collarette	Circular or ovoid lesion with a rim of scale	<ul style="list-style-type: none"> ■ Superficial pyoderma ■ Dermatophytosis ■ Demodicosis 	<ul style="list-style-type: none"> ■ Pemphigus foliaceus
Lichenification	Thickening of the skin with accentuation of the superficial skin markings (i.e., exaggerated skin lines)	<ul style="list-style-type: none"> ■ Bacterial overgrowth ■ <i>Malassezia</i> dermatitis 	<ul style="list-style-type: none"> ■ Chronic inflammation or friction

Despite overlap between clinical signs and distribution of different dermatologic lesions, a tentative diagnosis can often be made based on history and clinical appearance alone.

commonly found at the lumbosacral area, tail base, ventral abdomen, and caudomedial thighs.⁵ In cats, miliary dermatitis may also develop.⁶

Mites and Lice: Sarcoptic and notoedric mange tend to result in intense pruritus, papules, crusts, gray to yellow scaling and hyperkeratosis, excoriations, and alopecia. Lesions can occur anywhere but tend to occur on the ear margins, face, elbows, hocks, and ventral abdomen.^{7,8} Demodicosis typically results in alopecia, scaling, comedones, and follicular casts along with folliculitis lesions (papules, pustules, crusts, epidermal collarettes).⁴ The face and feet are commonly affected.⁵ Cheyletiellosis produces the hallmark features of excessive scaling and pruritus, typically referred to as “walking dandruff.”⁷ *Trombicula* (chiggers), lice, and nits are frequently visible on the patient’s hair or skin.

Bacterial Skin Infections

Common features of superficial pyoderma/bacterial folliculitis are erythema, papules, pustules, crusts, and epidermal collarettes, with or without pruritus.^{5,9} Appearance can be influenced by coat type, breed, and immune status. For example, short-coated dogs with folliculitis may exhibit a “moth-eaten” alopecia⁹ and long-coated dogs may initially only appear to have a dull coat with hair loss and some scaling or odor.

Common features of deep pyoderma/bacterial furunculosis are nodules, draining tracts, and ulcers.¹⁰ Frequently, these lesions are more painful than pruritic.¹⁰

Malassezia Dermatitis

The most common clinical appearance of *Malassezia* dermatitis is erythema and keratoseborrheic scaling, often associated with malodor.¹¹ Mild to severe pruritus

is often present.¹¹ In chronic cases, alopecia, lichenification, and/or hyperpigmentation can develop.¹¹ *Malassezia* dermatitis commonly affects the ventral neck, skin folds, interdigital spaces, periocular areas, ears, axillae, ventral abdomen, medial hindlimbs, and perineum.¹¹ Frequently, reddish-brown nail staining with brown exudate and claw-fold swelling are seen.¹¹

Dermatophytosis

Dermatophytosis is more common in cats than in dogs, and clinical manifestations vary. The most common presentation is similar to that of bacterial folliculitis: papules, pustules, alopecia, and crusts.¹² Also seen are plaques and nodules, especially on Yorkshire terriers or Persian cats, and brittle nails.¹² Kittens in particular may exhibit no clinical signs or mild, focal hair loss. Although lesions may occur anywhere on the body, they commonly occur on the face and paws, particularly in cats.¹² Pruritus may be absent to severe.¹²

Allergies

Allergic disease in dogs most commonly leads to pruritus or erythema of the periocular region, ears, muzzle, neck, forelimbs, axillae, and inguinal regions. Not as commonly involved are the edges of the pinnae; lesions in these areas should raise concern for other conditions such as sarcoptic mange or vasculitis. Secondary bacterial or *Malassezia* skin infections are common in dogs with allergies.⁵

Allergic disease in cats frequently affects the head and neck.¹³ Common characteristics are pruritus, small crusted papules (miliary dermatitis), and self-induced alopecia with or without eosinophilic granuloma complex lesions (granuloma, plaque, indolent/rodent ulcer). Rarely, plasma cell pododermatitis, seborrhea, exfoliative dermatitis, respiratory signs, or conjunctivitis may be exhibited by cats with allergies.¹³ Patients with food allergies may exhibit signs that are indistinguishable from those with environmental allergies, but food allergies may also lead to gastrointestinal signs, urticarial plaques, or vasculitis.¹⁴

DIAGNOSTIC TOOLS

Although community medicine practitioners must frequently base treatment on history and clinical appearance alone, several rapid and inexpensive diagnostic tests are available to assist with the diagnosis

**TABLE 2** Point-of-Care Diagnostic Techniques

DIAGNOSTIC TEST	MATERIALS NEEDED	ABLE TO DIAGNOSE
Flea combing	<ul style="list-style-type: none"> ■ Fine-toothed comb 	<ul style="list-style-type: none"> ■ Fleas ■ <i>Cheyletiella</i> mites ■ Lice
Impression smear	<ul style="list-style-type: none"> ■ Collection tool (indirect impression) ■ Glass slides ■ Modified Wright-Giemsa stain ■ Microscope 	<ul style="list-style-type: none"> ■ Bacterial infections (pyoderma) ■ <i>Malassezia</i> dermatitis ■ Fungal infections ■ Pemphigus foliaceus (tentative) ■ Eosinophilic granuloma (tentative)
Acetate tape impression	<ul style="list-style-type: none"> ■ Clear adhesive tape ■ Glass slides ■ Modified Wright-Giemsa stain ■ Microscope 	<ul style="list-style-type: none"> ■ Bacterial infections (pyoderma) ■ <i>Malassezia</i> dermatitis ■ <i>Demodex</i> mites (squeeze skin) ■ <i>Cheyletiella</i> mites
Trichogram	<ul style="list-style-type: none"> ■ Glass slide ■ Mineral oil ■ Cover slide ■ Microscope 	<ul style="list-style-type: none"> ■ <i>Demodex</i> mites ■ <i>Cheyletiella</i> mites ■ Lice ■ Dermatophytosis
Skin scraping	<ul style="list-style-type: none"> ■ Scalpel blade ■ Glass slide ■ Mineral oil ■ Cover slide ■ Microscope 	<ul style="list-style-type: none"> ■ <i>Sarcoptes</i> mites ■ <i>Cheyletiella</i> mites ■ Lice ■ <i>Notoedres</i> mites ■ <i>Demodex</i> mites (deep scrape)

of common skin conditions (TABLE 2). Cytology, trichograms, and skin scrapings require use of a microscope but can provide a more specific diagnosis and therapeutic approach, reducing overall cost and frequency of veterinary visits.

Cytology

Cutaneous cytology is extremely useful for identifying bacteria, yeast, inflammatory cells, neoplastic cells, and other abnormal cells such as acantholytic keratinocytes.⁹ Cytology can be performed by the following 3 main methods:

- 1. Direct impression smear:** Direct smears are created by placing a slide directly against a ruptured pustule, moist skin, or exudate. Freshly ruptured pustules, if present, yield the most diagnostic results. Papules and epidermal collarettes may also be useful.⁵
- 2. Indirect impression smear:** Indirect smears are created by collecting material with a blade, swab, or other instrument and placing it on a slide. This type of smear is especially useful in areas that are otherwise difficult to sample (e.g., claw folds).
- 3. Acetate tape preparation:** This technique involves firmly pressing clear adhesive tape against a lesion. It is most useful for dry, scaly lesions or for hard-to-reach locations (e.g., folds, interdigital spaces). Squeezing the skin before applying the tape can help with visualization of *Demodex* mites.¹⁵

When evaluating slides, note not only the presence but also the amounts of organisms and inflammatory cells that are seen. For recording presence of organisms, a semiquantitative scale ranging from 0 to 4+ is commonly used, in which 0 represents none and 4+ represents a massive, easily detectable amount.¹⁶ This technique can be useful for determining the significance of the finding as well as monitoring progression during follow-ups. A small number of cocci or yeast may represent normal findings. However, for patients with deep pyoderma, absence of bacteria on cytology does not rule out a bacterial infection,⁹ although large numbers of inflammatory cells should be present. For this reason, cytologic findings should always be interpreted in association with the clinical findings.

Cytology, trichograms, and skin scrapings require use of a microscope but can provide a more specific diagnosis and therapeutic approach, reducing cost and frequency of visits.

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Trichogram

Trichograms are performed by plucking hairs from an alopecic or hypotrichotic lesion, placing them in a drop of mineral oil on a glass slide, and then adding a cover slide before microscopic evaluation. This assessment is less invasive than deep skin scrapings and may be used to identify lice, dermatophytes,¹² and mites (*Cheyletiella*,⁵ *Demodex*), although lack of visualization of organisms does not rule out these infections.^{5,12,15}

Trichograms are also used to identify broken hair shafts in self-induced alopecia. This diagnostic tool is particularly useful for areas that are hard to reach or difficult for performing skin scrapings (e.g., face, feet).

Skin Scrapings

Superficial skin scrapings are obtained by collecting cells and organisms from the top layer of the skin by using a scalpel blade. Ideally, scrapings should be performed where the skin is not excoriated. Superficial scrapings can be diagnostic for mites (*Cheyletiella*, *Notoedres*, *Otodectes*, *Sarcoptes*) and lice.⁵ However, if results are negative and clinical suspicion is high, a treatment trial is indicated.

Deep skin scrapings are obtained by squeezing the skin until capillary bleeding is seen.¹⁵ Deep skin scrapings are typically used to detect *Demodex* species mites.¹⁵ For patients with demodicosis, the organisms should be readily detected when multiple sites are sampled by using this technique.

Further Diagnostic Tests

If the results of the initial diagnostics are inconsistent with clinical signs or the patient does not respond to initial treatment, further diagnostic tests to consider include:

- Bacterial culture and susceptibility (should always be paired with cytology for interpretation)
- Biopsy and histopathology
- Wood’s lamp examination
- Dermatophyte culture

Note: A Wood’s lamp examination and dermatophyte culture should be considered for every patient with hypotrichosis/alopecia—particularly cats.

CONCLUSIONS

The 3 most important initial steps for diagnosing common skin conditions in community medicine

practice are taking a clinical history, performing a physical examination, and flea combing the patient. When access to further diagnostic testing is not available, a treatment trial based on a tentative diagnosis according to those initial steps should be implemented. However, for practitioners who have access to a microscope, simple and relatively inexpensive diagnostic tools (cytology, trichograms, and skin scrapings) can lead to a definitive diagnosis and streamline the treatment plan. **TVP**

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