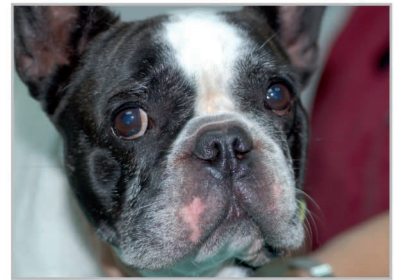


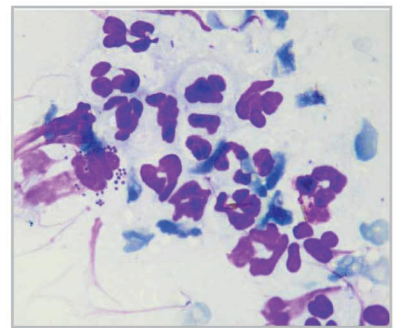
# VETERINARY **focus**

Special edition

The worldwide journal for the companion animal veterinarian



## The 15-minute consultation of the pruritic dog



Pascal Prélaud  
Ursula Mayer  
Anthony Chadwick  
Laura Ordeix

# The 15-minute consultation of the pruritic dog

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## The authors



*From left to right: Pascal Prélaud, Ursula Mayer, Anthony Chadwick and Laura Ordeix.*

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Anthony qualified from Liverpool University in 1990 and spent a couple of years in mixed practice in Wales before gravitating back to his roots in Liverpool. Early on in his career, he realised he knew very little about dermatology and got the bug to study more. He passed his RCVS certificate in veterinary dermatology in 1995 and immediately set up a peripatetic dermatology practice in the North of England. This is still running today. Anthony set up a first opinion practice in Liverpool in 1997 which was sold in May 2011. This has enabled him to have experience in first opinion and referral dermatology so he understands practitioners' dilemmas.

Anthony has lectured extensively in the UK and abroad on dermatology and in February 2010 set up The Webinar Vet, an on-line company that delivers lectures via the internet to thousands of vets all over the world. A wide range of subjects as well as dermatology are covered on this service.

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Ursula graduated from the Veterinary Schools of Leipzig and Vienna in 2001. She finished her Doctoral thesis in the field of Dermatology at Vienna's Veterinary school in 2003. She holds the Certificate of Veterinary Dermatology since 2006 and she is a member of the European College of Veterinary Dermatology since 2008. After a clinical lecturer position at the University of Pennsylvania she opened her own dermatology practice in Germany in 2009 ([www.haut-tierarzt.de](http://www.haut-tierarzt.de)).

Today, she works in 4 veterinary centres. She has kept her interest in scientific and lecture work. She has authored scientific articles in national and international journals. Her areas of special interest besides otology and allergy are dermatological lasers, perianal fistulas and client communication. Since 2010 she holds the position of the Further Education Meetings Secretary on the board of the ESVD (European Society of Veterinary Dermatology).

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## Pascal Prélaud

Pascal graduated in 1984 from Toulouse Vet School. In 1987 he founded CERL, a veterinary clinical pathology laboratory in Paris, which he continues to manage. This laboratory was a pioneer in the field of allergic testing in Europe. Pascal has worked as a specialist in veterinary dermatology since 1987. He now works in Paris in a veterinary specialists clinic (Advetia).

Member of the International Task Force on Canine Atopic Dermatitis, he is the author of many scientific articles and lectures, mainly on allergic dermatitis in dogs and cats and otology. He has authored three books on veterinary allergies (1991, 1999, 2008), two on ear diseases (2010) and a book on endocrinology (2002), which has been translated into several languages. Pascal Prélaud is co-author of *A Practical Guide to Feline Dermatology* (2000) and *A Practical Guide to Canine Dermatology* (2008) with Dr. Eric Guaguère.

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# Introduction



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## There is no intuition in dermatology

Dermatology is different! The classic approach based on pattern recognition and on the practitioner's experience unfortunately doesn't work... There is no room for intuition in dermatology, only a step-by-step approach will work requiring patience, method and time.

This explains the frequent disappointments throughout this discipline and has led the authors of this Focus Special Edition to develop the concept of a "15-minute consultation": what to do – and more importantly what not to do – when you have only limited time to handle a new dermatology case.

This Focus is therefore dedicated to general practitioners. It lists all the pitfalls in the management of dog pruritus, including overly simplistic history taking, the systematic use of inappropriate complementary tests (biopsies, allergy testing...) or the misuse of drug cocktails before a diagnosis is made... In this issue, you will find the keys to easier and more valuable gathering of information from the owner as well as how to help him implement a long-lasting treatment.

Finally, this magazine will stress the much overlooked value of a forgotten tool: the microscope. Skin scraping and cytology are the complementary tests with the highest added value in dermatology, both on the scientific and the financial sides. Buying a microscope guarantees a return on investment in only one month. To help you, the authors have summarised their many years of experience and given you all their tips to master the myriad uses of a microscope in less than 6 months. Even if it bears an oldish image, together with a video and a plasma screen, the microscope can become a "high-tech" tool with indisputable benefits to communicate with the owner.

It is my pleasure to share this original Focus as the result of four European dermatologists' work, and hope it will help you find more pleasure in dermatology.



**Philippe Marniquet,**  
DVM, Dipl. ESSEC  
Royal Canin



# 1. Dermatology is different

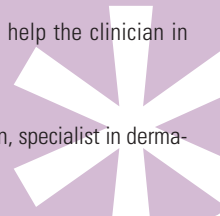
## > SUMMARY

There are two diagnostic approaches in veterinary medicine (pattern recognition and problem-based approach) and dermatology is best practised following the second approach.

This chapter will help the clinician to implement dermatology more effectively in a first opinion practice. An approach to the 15-minute consult is given which meets the needs of the busy practice without preventing a diagnosis being made.

The importance of a logical approach is stressed and many useful tips are given to help the clinician in approaching the dog with pruritus.

They also clarify how the different tasks should be split between the referral veterinarian, specialist in dermatology, and the general practitioner who refers to him.



## Introduction

Are you familiar with this situation? Reception or the waiting room announces the next patient suffering from chronic itching on your computer and you are wondering if you should refer the case to one of your colleagues. Unfortunately this is not possible as everybody is busy. After only 5 minutes in the treatment room you have the urgent desire to scream and the owner is bombarding you with questions and telling you that she has already seen many of your colleagues who have only taken her money because her dog is still itching. You are her last hope and are now expected to solve the problem in 10 minutes, because then, the next patient on the list will be waiting for you.

There are only a few general practitioners who are happy to deal with dermatology cases. Skin problems are a frequent reason for owners to change vets. Why is this field of veterinary medicine so difficult and frustrating for vets and owners?

The problem lies not with the vets, nor with the owners but with the subject. Let's examine it more closely.

## 1/ Diagnostic approaches in medicine

### A) Pattern recognition

Pattern recognition is frequently used in medicine. From this, based on a short preliminary history and clinical examination, a suspected diagnosis is made and the animal is treated. For example a young dog is brought into the practice with a dry cough and unaffected general condition. On examination the dog is found to have red tonsils and the cough can be triggered, otherwise nothing abnormal is found. This was already the third case with similar symptoms the vet had that week. In most cases a diagnosis of kennel cough was made and treated accordingly. However, the vet was not able to prove with a clear test that it was this disease and not another that was causing the cough. The



**Figure 1.** In dermatology, the problem-based approach works better than the pattern recognition.



advantages of this method are that a diagnosis is made with little outlay in terms of time and money and that it is very likely to be correct. Most of the time, the animal can be rapidly helped and the owner is satisfied because he or she now knows what the animal is suffering from and how it can be made better rapidly.

## B) Problem-based approach

On the other hand, in the problem-based approach, after a detailed history and examination, a list of problems is drawn up. The differential diagnoses are listed for each problem in order to draw up a plan to work out the cause. Here the various illnesses are included or excluded using further tests (*e.g.* blood tests, diagnostic therapies) - until a definitive diagnosis is reached (**Figure 1**). Only then the treatment can be given. This approach is mainly used in

complicated clinical cases *i.e.* for animals that do not respond to standard treatments or chronic diseases. The advantage of this method is that a definitive diagnosis is reached and therefore the best treatment and a soundly-reasoned prognosis can be drawn up. Furthermore, with this approach, even complicated clinical signs with multiple diseases or factors can be unravelled.

## 2/ Why is dermatology different?

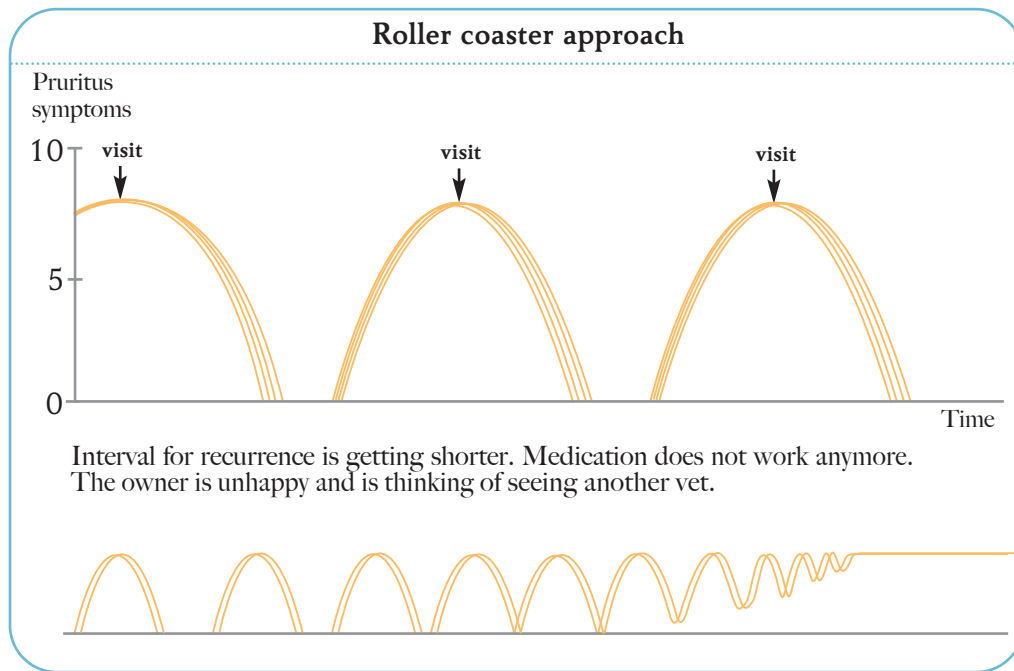
The particular feature of dermatology is that the pattern recognition approach is rarely successful and in most cases the problem-based approach has to be used. Initially this can be more expensive than the pattern recognition approach. However, reaching a diagnosis early saves money later because ineffective treatments are not given and the dog is more likely to improve with correct treatment. Only then can the treatment of the problem start. This goes against an owner's normal expectations, however, who would most prefer his vet to recognise the cause of his pet's suffering immediately and in the best case scenario give the animal an injection which could solve the problem in a few days, without the beloved pet or him having to suffer.

## A) Why are "first-sight diagnoses" so rare in dermatology?

The skin is an organ which has only very limited opportunities to respond to various stimuli. As a result of this, many skin diseases look the same. However it is a fact that the same skin disease can display very different clinical signs (*e.g.* dermatophytosis with or without itching; multi-

### Why are "first-sight diagnoses" so rare in dermatology?

- Everything looks the same – there is little opportunity for the skin to respond.
- The same disease can have different manifestations.
- Secondary infections almost always cause general itching and mask the original manifestation.
- Several diseases are present at the same time.
- In chronic diseases, changes in the skin mostly look alike.
- Many diseases have a multi-factorial origin.



**Figure 2.** This is what may happen when the pattern recognition approach is used in dermatology.

focal alopecia with or without skin inflammation, folliculitis, furunculosis or nodular changes (kerion); in cats feline acne or miliary dermatitis is possible, whilst in dogs trichophyton infections a *pemphigus*-like reaction can occur on the head region with the presence of acantholysis on cytology ...).

In most skin diseases damage to the skin barrier or weakening of the immune system occur – which can lead to secondary infections with bacteria or yeasts. These are parts of the normal skin population but can increase excessively and lead to infection with inflammation and itching. As a result "everything" looks the same and even diseases without primary itching are accompanied by itching.

Often we also have to deal with several diseases at the same time, the manifestations of which overlap (*e.g.* secondary pyoderma and hypothyroidism or a demodicosis triggered by iatrogenic Cushing's disease due to the steroid treatment of an underlying allergy).

The chronic nature of many diseases also contributes to the similar appearance of the clinical picture with lichenification (elephant skin) and hyperpigmentation due to various causes. Moreover there are many diseases which have multifactorial causes: *e.g.* otitis has predisposing factors (*e.g.* pendulous ears), a primary cause (*e.g.* allergy),

secondary causes (*e.g.* yeast infection) and perpetuating factors with chronicity (swelling of the auditory canal). It is important to take all the factors into account here as treating only one of them will not lead to a successful outcome.

## B) What happens when pattern recognition is applied to dermatology problems?

A dog with itching and dermatitis comes to the veterinary practice. The vet wonders what is the mostly likely diagnosis for this animal: allergy with pyoderma (pattern recognition model)? The dog is treated with cortisone and antibiotics. It soon gets better. The owner is pleased. After a time the dog again displays itching and dermatitis. The owner returns with confidence to the vet who has helped his pet. The vet checks in his files and finds out that his last treatment worked and gives the pet the same treatment. Once again the treatment helps. However, over time the intervals between the bouts of symptoms become shorter and shorter. Some animals also develop side-effects to the cortisone or there are yeast infections or bacterial resistances. As a consequence, the treatment no longer works. The vet then often tries another anti-microbial or increases the dose of cortisone. This does not really work either and the owner

**Figure 3.** Ask the owner to summarize the reason for his visit in two sentences. Then ask him closed questions in order to have a full picture of the problem.



gets more and more unhappy and decides to find another vet (**Figure 2**).

### 3/ How can you improve matters?

#### A) The 15-minute consultation - what can you do in 15 minutes?

##### 1) Short history (5 minutes)

In order to be able to take a dermatology history in such a short time, you will have to ask only a few open and many closed questions. The owner is often not very compliant with this and there is the danger of missing important inform-

ation. Therefore, prepare the owner by explaining beforehand that to solve a dermatological problem you will need more time, however this exercise will help find the cause of the animal's condition and a solution more quickly. A longer follow-up appointment will be necessary. There will be then sufficient time to go into all the important details. Take account of the animal's signalment and ask the owner to summarise the reason for his visit in a couple of sentences. Then ask closed questions in order to understand the problem more specifically (**Figures 3 and 4**).

##### 2) General and dermatology examination, collecting samples for the minimum database (5-10 minutes)

The dermatology minimum database include flea comb, surface and deep skin scrapings (in alopecia and/or itching) and samples for cytologic examination of the ears and skin (where the skin surface is broken).

Staining and evaluation of the dermatology minimum database samples:

- Labelling and staining by a trained nurse, microscopic examination by the vet at the end of the consultation period. The owner is informed by phone or during the follow-up appointment. Then the further treatment is also decided. The disadvantage with superficial skin scrapings is that some mites can escape from the slide (*e.g. otodectes*). When possible look at the slides as soon as you can (the procedure should only take 30 seconds).
- Send them to a laboratory for evaluation. Inform the owner by telephone or at the next appointment of the results (generally within 1-3 days). The disadvantage is that skin scrapings can hardly be sent without some

#### The most important questions to ask during the first consultation

- What was the first symptom that struck you and what did it look like at the beginning?
- Is itching present? If so how severe is it and what came first, skin lesions or itching?
- Which parts of the body are affected (by itching, by skin lesions)?
- The duration of the disease and course (is it the same as it was before, is it getting increasingly worse, or does it wax and wane)?
- Are there any other animals or people in contact with the affected pet?
- Has the animal ever been abroad?
- General condition, other diseases, vaccination, worming and parasite prophylaxis?

## Tips and tricks

A good way to gain experience in skin cytology is to look at the slides yourself and if you are unsure about your conclusions to send them to a veterinary laboratory then. This way you will be able to compare your results and learn quickly.

material from the slide being lost. It is better to put the scraped material into some paraffin oil within a sealable container before sending it to the laboratory.

### 3) Further procedure in the treatment (5-10 minutes)

- If the problem is not really serious, no treatment is required, until the results of the dermatology minimum database are available. It is good to schedule a longer appointment in the next 1-3 days *i.e.* when the results are expected.
- If the problem is serious or the owner wishes the treatment to start immediately without waiting for the longer follow-up appointment:
  - 1) **Suspected skin infection:** treat with anti-microbial shampoos, foam, or the like. If dermatophytosis is suspected, if possible take a sample for fungal culture beforehand as in this situation diagnosis after topical treatment is often more difficult to reach.
  - 2) **Suspected parasites:** treat with antiparasitics for fleas and mites (a flea comb should be used and skin scrapings taken beforehand).
  - 3) **Serious itching:** use antihistamines.
  - 4) **Combination of the first three possibilities:** be careful when combining antiparasitic and shampoo treatment (do not bathe for at least 24 hours before and after applying spot-on treatments. Select waterproof anti-parasitics).
  - 5) **Suspected systemic disease, systemically ill patient:** if the clinic is well equipped and has experienced personnel: in-patient admittance – begin the evaluation and treatment in the clinic. If it is not possible to do it in the clinic, refer the animal immediately to a suitable colleague.
- The patient is to be referred, but getting an appointment with a specialist requires waiting for a fairly lengthy period (weeks). A treatment until then remains necessary: treatment options 1-3 above-mentioned, if possible after

discussion with the specialist. A letter of referral must be provided as well as preliminary findings, drug history to be taken to the appointment or faxed in advance.

- Dermatology minimum database collection is not possible because time is limited or you have little experience. Arrange a follow-up appointment as soon as possible where tests can be performed or the animal referred. If at all possible do not start any treatment at this stage as topical treatment or antiparasitics can produce a false result for these kind of tests (skin scraping, cytology). Antihistamines can already be given if there is itching.

Give the owner a dermatology history sheet to take home to be completed at leisure and before the next appointment (see **Chapter 2**). At the longer follow-up appointment, go through this with the owner in order to fill in any information missing in the history report. Then you can discuss the problems, results of the quick tests, differential diagnosis, plan for evaluation and treatment with the owner.

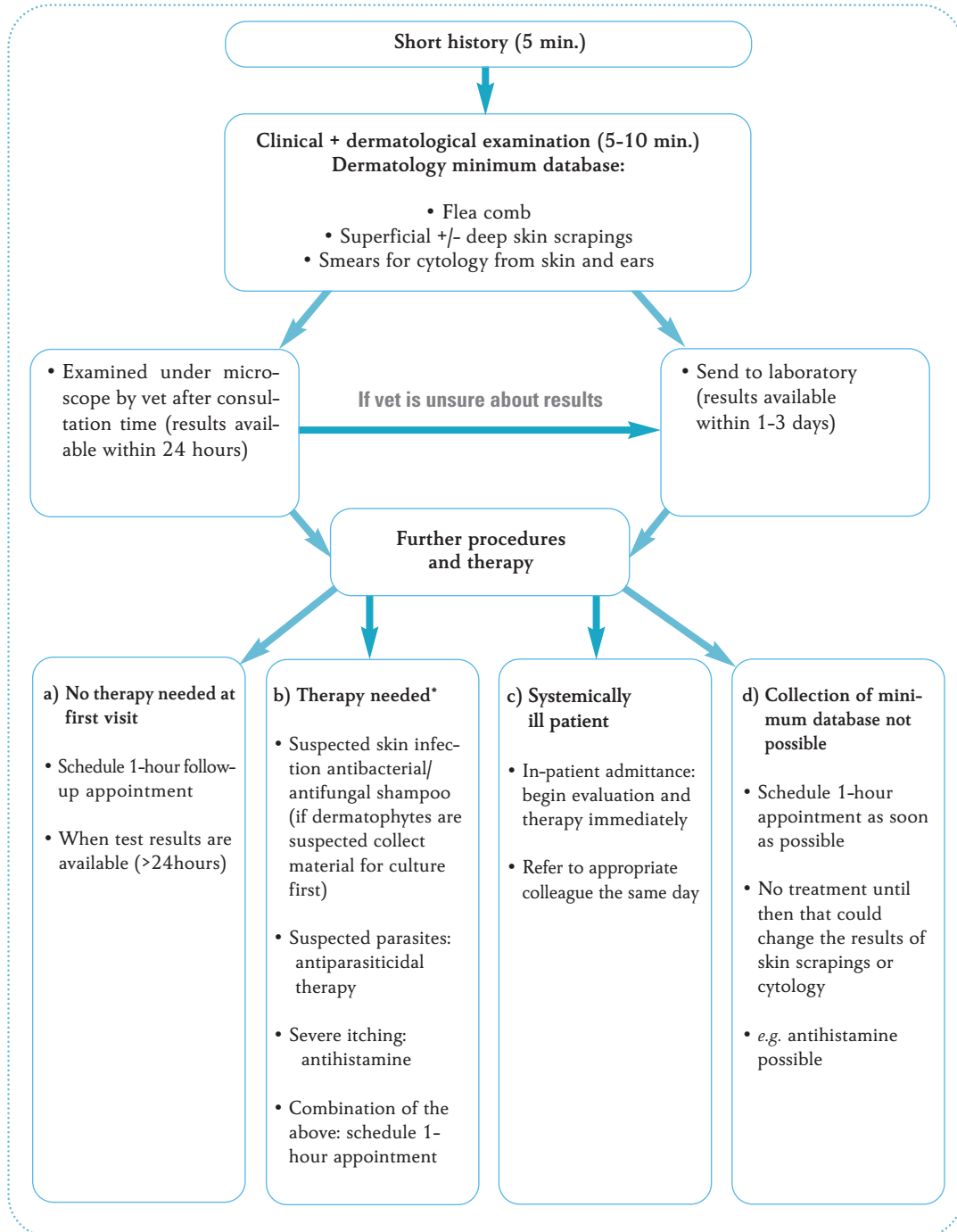
## B) Integrating dermatology patients into the practice

Making a few organisational changes can offer a better service to dermatology patients and their owners and make them happier.

### 1) Making appointments

The first appointment in a dermatology case can take a long time because you need to compile a detailed history, which can take up to 30 minutes as well as carry out additional tests, allow time for communicating and sharing information with the owner. You need to train your reception staff accordingly. It helps if the owner fills in a history form and an itching scale (**Figure 5**) at home before the appointment. This gives him/her time to think about the often long standing nature of the disease and enables them to have all the necessary information ready for the

**Figure 4.** 15-minute consultation decision tree.



*\*Referral: if appointment in >1 week time and treatment needed follow b, if possible after discussion with specialist.  
(Please be aware, that different legal regulations may apply in different countries)*

To differentiate between different causes of a skin or ear problem, in order to treat the disorder (e.g. through an elimination diet) and to assess the success of the treatment, it is often important to assess the severity of the itching as precisely as possible.

Your assessment is very important in this as you can observe your animal day in, day out in its normal environment. The descriptions below should make this easier for you.

Itching in animals can manifest as scratching, licking, increased cleaning, gnawing, rubbing against objects and shaking the ears.

When you have decided how severe your animal's itching is, please mark a cross on the following line:



0 = no itching

1 to 2 = mild itching

3 to 4 = frequent itching, but not when sleeping, feeding, playing or walking (other interesting activities)

5 to 6 = frequent itching, wakes up partially to scratch, no itching when feeding or playing

7 to 8 = very frequent itching, frequently wakes up to scratch, sometimes also when feeding or playing

9 to 10 = uninterrupted itching, interrupts play, feeding, sleeps little, scratches in the consultation room (environment where there is a lot to distract the animal)

Figure 5. Example of an itching scale to be filled by the dog owner.

appointment. The assessment of the itching by the owner is very subjective. The owner of a dog that is constantly scratching even in the treatment room could describe it as scratching a little; another would say that his dog is scratching a great deal even if it has only been scratching itself for a short period three times a day. Providing itching scales with description helps to objectivise this kind of assessment. This is also very useful for further treatment and therapy, as the owner is thus trained to observe and assess the itching effectively.

- The owner makes an appointment at reception:

In chronic skin cases allow 1 hour for the first appointment – arrange for all the preliminary forms to be provided and filled in.

- Acute case in the consultation: 15-minute visit – followed by a 1-hour appointment in the next 1-3 days.

## 2) Give the owner written information to take home

As we frequently have to deal with chronic diseases in dermatology, it is very helpful if the owner learns as much as possible about the disease, so that he/she can make well-informed decisions about further diagnostics and treatment. Usually the amount of information to remember during the visit to the vet is too much to take for the owner. Many pet owners are indeed quite stressed and some are so

concerned about their pets' health that they do not listen or understand things very well. Written information they can take home with them is always very helpful. Have information sheets on diseases and diagnostic measures available and give them to the owners to take home.

The treatment the owner has to carry out at home is very often a challenge for him or her. In the field of dermatology it is frequent that several drugs have to be administered at the same time over lengthy periods. For example, antibiotic tablets to be given twice a day over 3 weeks; weekly bathing with a medical shampoo and application of an antiparasitic. The ears may also have to be cleaned with a cleanser (1 x daily) and treated with an ear medicine (2 x daily) and additional tablets may need to be given to reduce the itching. It is extremely important not only to explain how to administer the treatments and show the owners how to use ear medication for example, but also to give them all the necessary information in writing. Give them an appointment summary with specific treatment instructions to take home.

In the decision-making process about further diagnostics and treatment, evaluating the various costs, benefits and potential side-effects is also extremely important. This can also be done beforehand by preparing information sheets compiling all the common diseases and treatments and giving them to the owners. Therefore they can decide at home with the whole family which option is best for them and their pet.

**Figure 6.** A dermatologist's best friend. The microscope with the video and the plasma screen to show to the dog owner.



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### 3) Veterinary nurse-training

Explaining the diagnostic measures and treatments is time-consuming and needs to be repeated over and over. It is very helpful to train your veterinary nurses to do this. Training can include: explaining and practising ear cleaning, applying topical ear medications and how to correctly apply flea control or to shampoo an animal. Furthermore, knowing when to use the suitable kind of shampoo or how to give an animal a pill is crucial. Telephone follow-up is extremely important in dermatology but takes time. In many cases it can be done by a trained nurse. A nurse can also play a vital role in making sure that elimination diets are effective.

### 4) Regular controls

Always set an appointment for the next check-up and explain to the owners how important it is. Many skin diseases get better after the first treatment (*e.g.* the secondary infections) which encourages the owner not to present the animal for a check-up. However, the problems frequently return after a short time. The owners seldom link it to the fact they have not brought the animal back for a check-up but rather believe the vet has made a wrong diagnosis or given the wrong treatment. It is precisely for this reason that you should also consider phoning the owners who have missed or refused to be given a follow-up appointment.

### 5) Build up a good working relationship with a skin specialist

The successful treatment of skin diseases requires a great deal of specialist knowledge and organisation. You need to evaluate if you can offer these services in your practice. Not every vet can be proficient in all the veterinary fields. Therefore, build up a good relationship with a skin specialist of trust to whom you can refer cases which go beyond what your practice can offer. This will ensure customers' faithfulness to your practice.

### 6) Continuing education in dermatology: microscopy

If your interest in skin diseases is aroused, there is a great deal of further training available in this area. For all the vets who would like to offer more than the basic dermatological treatment in their practice, a good microscope (**Figure 6**) plus a knowledge combined with a practice of skin scrapings and cytologic smears examination are essential. Dermatology without this competence is like driving a car without a steering wheel.

## Tips and tricks

- Dermatology appointments:
  - 15-minute consultation: if longer appointment not possible,
  - 1-hour appointment: owner should fill in history form and itch scale before.
- Written owner information: explain one or two things at the consultation, give written treatment summary and owner information sheets about dermatological diseases for use at home.
- Veterinary nurse training: telephone follow-up, owner compliance, instructions for therapy (ears, shampoo, flea treatment).
- Regular controls: always schedule next appointment, phone the pet's owner if it is missed.
- Good working relationship with the veterinary dermatologist.
- Buy a microscope, pursue training on how to use it.

**Table 1.** Responsibilities of referring vets and vets to whom the referral is made (adapted from AAHA - American Animal Hospital Association).

Referring vet	Vet to whom the referral is made	Both
<b>1. Before the referral</b>		
<p>Know which specialists are available locally.</p> <p>Consider a referral in good time.</p> <p>Respect an owner's wish for a second opinion.</p>	<p>Inform professional veterinary circles about treatments offered, qualifications, the organisational procedure and approximate costs for an initial consultation (homepage, flyer etc.).</p>	<p>Building up a relationship based on mutual trust and respect.</p> <p>Everybody's aim is the best treatment for the patient.</p>
<p>Inform the owners about the qualifications and additional knowledge of the specialists, as well as about the costs they can expect and the timeframe for the initial consultation.</p>	<p>Inform veterinary professionals and owners about which cases fall within their own area of specialist knowledge.</p>	<p>Emphasise the relationship and communication between general vet and specialist in their own marketing:</p> <ul style="list-style-type: none"> <li>- Working together as a team.</li> <li>- Emphasise the additional qualifications that specialists have.</li> <li>- Emphasise the important role of general vets.</li> </ul>
<p>Recognise that telephone consultations through a specialist require time and resources which it is appropriate to pay for.</p>	<p>In the case of own referral by an owner – point out the advantage of teamwork and communication with the general vet.</p>	<p>Make all efforts to maintain the relationship between the owner and both vets.</p>
<b>2. During and after the referral</b>		
<p>Transfer responsibility for the case to the specialist.</p>	<p>Explain the reasons to the owner if tests have to be repeated.</p>	<p>Communication should always take place directly between the vets and not via the owner.</p>
<p>Summarise the course of the case as well as the treatment in a letter of referral and give the owner preliminary findings to take with him to the appointment or fax them.</p>	<p>Limit the treatment to your own special area. Only give further treatments when necessary, in the best interest of the patient and in consultation with the general vet.</p>	<p>Communication between the vets in cases of doubt or criticism by the owner – with one of the vets involved.</p>
<p>Don't start any diagnostic testing which will not be available in time for the referral vet or which will need to be repeated by him.</p>	<p>Timely information in writing or orally of the general vet on the treatment with regular updates.</p>	<p>Direct communication between the vets in cases where there is dissatisfaction with the other vet.</p>
<p>Inform the specialist if the patient returns to the general vet's practice with the same problem.</p>	<p>Communication with the general vet on the wish to refer the animal on to a further specialist.</p>	
	<p>Communication with the general vet on the timing and further treatment by him.</p>	
	<p>As much support for the general vet as possible without prejudicing one's own integrity.</p>	

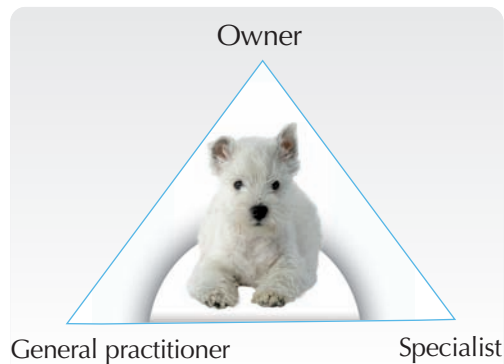
*(Please be aware, that different legal regulations may apply in different countries.)*



### When should a referral be considered?

- If there is a need for additional specialist knowledge and experience (*e.g.* therapy).
- If there is a requirement for specialist instruments/equipment or services.
- If no clear diagnosis can be reached.
- If some cases cannot be explained or when a case is becoming worse.
- If the owner is dissatisfied with the progress of his case.

**Figure 7.** The best treatment of the pet can only be performed by a tight co-operation between owner, general practitioner and specialist.



available. For the general vet it is very difficult to meet these requirements and the probability of losing these patients, even without a referral, is very high.

A further concern is that advising owners that they should be referred to a specialist could be perceived as an admission of a lack of professional competence. However, owners are usually familiar with the system of general practitioners and specialists from human medicine. Explaining that veterinary medicine also has experienced very rapid development in recent years and that all vets are not as equally well trained in some specialist areas will ensure that such a suspicion rarely arises. The common interest shared by owner, general practitioner and specialist is the best medical care of the pet – which for many diseases can only be achieved by a tight co-operation between the 3 parties (**Table 1 and Figure 7**).

### C) Referral to animal dermatologists

Vets are often frightened to lose patients to referral clinics, or have had negative experiences further to referrals. Our experience, however, is that the owners of pets referred at the right time very frequently request the option to be referred back, and return to your clinic. This is partly because the treatment at the specialist's has been associated in the owner's mind with unpleasant matters, such as a lengthier journey, less flexibility in terms of appointments and so on. Nonetheless, at your clinic, you have managed to build up a relationship of trust with the owner over the years.

However, pet owners who are unhappy with the treatment provided by the general veterinary surgeon or were only referred after asking to be so several times, are more unlikely to return. The same applies to the owners who have the impression that they have been referred too late. Of course there are also owners who, for any tiny medical problem, want their pet to be treated by a specialist and therefore decide to go to larger clinics where many specialists are

The right time to refer a pet depends on the dermatological expertise of the vet and what the owner wishes. The option of referral should, however, preferably be proposed at a too early stage rather than at a too late one, because if the decision is in the owner's hands, the latter cannot be unhappy with the vet.

### D) Communicating with the owner

Explain to your customers that dermatology is different so that they understand what to expect and what contribution they must make to ensure the success of the treatment. You, as the doctor, are the adviser. The owner is the person carrying out the treatment and who can observe his/her pet on a day-to-day basis in its normal environment. Give your customers the necessary information and guidance to perform these tasks, ask for observations from the domestic environment at check-up appointments and adjust the treatment accordingly to the greatest benefit to both the pet and the owner (for more details see **Chapter 4**).

## 2. History taking: a key element

### > SUMMARY

A questionnaire filled by the owner prior to the consultation is the first step. But then, active listening with open questions (proven to be more useful than closed questions) is a key element.

Information collected helps not only in compiling the differential diagnosis but also in choosing a treatment adapted to the owner's constraints.

The authors list the different hypothesis induced by the information collected in the various areas of the history.



### Introduction

Chronic pruritic dermatitis can pose a diagnostic challenge and its treatment can be even more challenging. In many cases the disease is long-standing and multifactorial, which necessitates elucidation and above all adaptation of the case to the owner's motivations. It is therefore essential to take a clear and detailed history, ideally comprising two distinct phases: the first involves a closed and exhaustive questionnaire, whilst the second phase comprises very open questioning to reiterate certain points raised in the questionnaire but also to determine the motivation and means available to the owner.

### 1/ Data collection

Numerous elements are needed for the diagnosis and establishment of a therapeutic protocol. To ensure that nothing is overlooked, a questionnaire can be a very useful aid (see **page 19**). The owner is asked to fill it out, with the help of a nurse if necessary. We then go over the important elements of this questionnaire during the consultation (**Table 1**). This approach ensures that nothing is overlooked and we can then concentrate on the most essential elements in the second phase of the visit.

**Table 1.** Questions that are often overlooked.

- Presence of other animals of the same species (at home + in other places)
- Age at the onset of the first symptoms
- Contagious nature
- Details of flea treatment and ear care
- Consistency of faeces
- Diet and any titbits
- Duration of each treatment undertaken
- Difficulties with compliance
- Reactions to topical treatments or shampoos

**Figure 1.** Closed questions are quicker but can induce misunderstanding (for instance, the owner does not consider a piece of cheese as a treat).



## 2/ Listen to the owner

By allowing the consultation to take place in a very open manner one can identify two essential elements for the implementation of an effective treatment protocol: the expectations of the owners and any difficulties encountered with previous prescriptions. One of the common problems encountered in practice is the ability of the practitioner to put themselves in the owner's shoes. By allowing the people who are requesting the treatment to express themselves, it is easier to adapt the treatment to them and their capacities.

Also, open questions (**Figure 1**) often reveal anomalies that can be packed with information, such as erratic food intake, places that the dog visits and the owner forgot to mention on the first questionnaire (workplace, neighbours, car etc.), reactions to topical products, inappropriate applications of topical products, etc.

A recent study revealed that more answers are obtained by open questions (Dysart, 2011). It is therefore important to allow the owners to express themselves without interrupting them. The most useful information is often obtained at the end of the history taking phase, by going back over certain aspects from a different angle.

**Table 2.** Diagnostic orientations provided by the history.

- Frequent shampoos: ineffective flea treatment
- Flea treatment not given often enough, possible flea infestation
- Presence of a cat: think of fleas and ringworm
- Human contagion: zones of tight clothing (fleas), pruritus of the arms, trunk (*Cheyletiella*, sarcoptic mange), ringworm often found on face or arms (dermatophytosis)
- Soft stools: possible food hypersensitivity
- Dog irritated after shampooing: irritant dermatitis
- Aggravated by topical corticosteroids: demodectic mange, ringworm
- Onset <6 months: ectoparasitic disease, allergic dermatitis in some breeds (French bulldog, Shar Pei, West Highland White Terrier)
- Onset between 6 months and 3 years: allergic dermatitis
- Onset >8 years: flea allergy dermatitis, food hypersensitivity, cutaneous lymphoma
- Predisposed breeds: atopic dermatitis, *Malassezia* dermatitis, syringomyelia, demodectic mange
- Lifestyle: behavioural disorders, sources of contamination, difficulty of administering future treatments

## 3/ Diagnostic value of the information obtained

The principal diagnostic aids provided by this step are summarised in **Table 2**.

### A) Breed

There are numerous breed predispositions for pruritic dermatitis (**Table 3**). In practice, the most useful are those

1/ Your name: .....

2/ Your pet:  
Name: ..... sex: ..... breed: ..... date of birth: .....

3/ Reason for consultation: .....

4/ Lifestyle:  
Living places (house, flat, garden): .....

Occasional living places (friends, kennel, weekend, holidays...): .....

Sleeping places: .....

Other pets (please circle the appropriate answer): •dog •cat •small pets •birds

Food: .....

•Regular: .....

•Titbits: .....

Foods used to give tablets: .....

5/ Current treatments:

Flea and tick treatments:

Product name	Frequency	Efficacy	Side-effects

Ear treatment:

Product name	Frequency	Efficacy	Side-effects

Shampoos:

Product name	Frequency	Efficacy	Side-effects

Other treatments:

Product name	Frequency	Efficacy	Side-effects

6/ Medical history:

Gastrointestinal disorders: .....

Respiratory disorders: .....

Behavioural disorders: .....

Others: .....

7/ Disease onset:

Date: ..... Lesions or itching localisation: .....

Contagious to man:      YES    NO

Behavioural disorders:      YES    NO



8/ Previous medical examinations:  
(circle the appropriate answer)

- Allergy tests
- Skin biopsies
- Skin scrapings
- Hormonal tests
- Haematological assessment
- Biochemical assessment
- Bacterial culture (antibiogramm)
- Fungal culture

Suggested diagnosis: .....

9/ Previous treatments:

Date	Drug	Efficacy	Side-effects

**Table 3.** Examples of main breed predisposition to pruritic dermatitis.

<b>Atopic dermatitis:</b>
Cavalier King Charles, Bulldogs, Staffordshire terriers, West Highland White Terrier, Labradors, Fox terrier, Jack Russel, Dalmatian, Boxer, German shepherd, Shar pei, Shih tzu, Bull terriers, Golden retrievers
<b>Flea allergy dermatitis:</b>
German shepherd, Chow chow
<b>Behaviour:</b>
Doberman
<b>Sebaceous adenitis:</b>
Akita, German shepherd, Belgian Shepherd, Poodle, Vizsla, Hovawart
<b>Syringomyelia:</b>
Cavalier King Charles, Yorkshire
<b>Epitheliotropic lymphoma:</b>
Cocker spaniel, Yorkshire terrier, Labrador
<b>Primary <i>Malassezia</i> dermatitis:</b>
Basset hound

*Note: there can be variation from country to country.*

for atopic dermatitis, syringomyelia, demodectic mange, behavioural disorders, and primary *Malassezia* dermatitis.

## B) Age at onset of lesions

Any pruritus that starts in a young animal (under 6 months) should invoke a diagnosis of ectoparasitic disease, or even an allergic dermatitis in some breeds (Westie, French bulldog, Shar Pei); in adults, consider ectoparasitic disease or allergic dermatitis, whilst in elderly dogs certain neoplastic disease should also be envisaged (cutaneous lymphoma). In animals under one year of age, a dietary cause is more common in cases of atopic dermatitis (Picco, 2008).

## C) Circumstances surrounding the onset

Certain circumstances of onset can help to orientate the diagnosis (**Figure 2**):

- A recent stay in a boarding kennel, recent contact with other animals, indirect contact with foxes: ectoparasites (fleas, sarcoptic mange),
- Recent infestation with fleas: pulicosis, flea allergy dermatitis, atopic dermatitis,
- Use of topical products: contact dermatitis, granular parakeratosis,
- Provoked by stroking or massages around the neck or after pulling on the lead: syringomyelia,
- After a visit to the grooming parlour: contact dermatitis, ectoparasites, ringworm,
- Following flea infestation: flea allergy dermatitis, atopic dermatitis,
- Lifestyle and environment.

## D) Habitat

The habitat provides vital information for the diagnosis of a possible contact allergy (where the animal sleeps for example), flea infestation, or trombiculiasis.

## E) Lifestyle

The lifestyle is very important in that it can be directly responsible for pruritic dermatoses:

- Exposure to the sun (solar dermatitis, actinic keratosis),
- Hierarchical disorders (licking dermatitis, alesional pruritus),
- Frequent baths (suppurative otitis, ineffective flea treatment), direct or indirect contact with wildlife (dermatophytosis), with foxes (sarcoptic mange),

- Hunting (traumatic folliculitis, dermatophytosis, ectoparasitic diseases: trombiculiasis, sarcoptic mange),
- Group housing (ectoparasitic disease: fleas, *Sarcoptes*, *Cheyletiella*).

## F) Living areas

It is important to be aware of all of the living areas frequented by the animal to implement effective and comprehensive external parasite control, but also to identify zones of parasitic contamination that are often overlooked by the owners.

## G) Diet

Knowledge of the animal's diet enables the implementation of an appropriate exclusion diet or the identification of any dietary imbalances. Recording every meal or titbit that the animal receives may prove difficult; the owners often omit numerous instances of food intake (breakfast, treats, titbits, walks, etc.) (**Figure 3**).

Contrary to common belief, animals fed on red meat do not present a higher risk of developing food allergy than those fed on white meat.

## H) Previous disease history

The existence of gastrointestinal disorders associated with the pruritus is indicative of a food allergy. The presence of rhinitis or conjunctivitis may indicate an allergy to airborne allergens. A previous history of urticaria or angioedema is often considered as a minor diagnostic criterion for canine atopic dermatitis.

## I) Progression of symptoms over time and seasonality of the pruritus

The existence of regular itching in specific sites is indicative of atopic dermatitis or flea allergy dermatitis. Pruritic dermatitis that arises primarily in the summer or autumn is indicative of parasitic dermatoses (trombiculiasis etc.) or

**Figure 2.** Each case is a puzzle and history taking is collecting the pieces... but in dermatology there are a lot of pieces!



allergies such as flea allergy dermatitis or more rarely pollen allergy.

## J) Topography at the start of the dermatosis

Knowledge of the localisation of the lesions at the start of the problem is essential since numerous dermatoses exhibit a preferential topography:

- Otitis, pododermatitis in atopic dermatitis,
- Dorsolumbar pruritus in flea allergy dermatitis,
- Elbows, free margin of the ear pinna with sarcoptic mange,
- Abdomen with superficial pyoderma,
- Scrotum with contact allergy,
- Periorificial zones with disorders of zinc metabolism.

**Figure 3.** Dermatology is an investigation: as with behavioural cases, the environment needs to be taken into account.



**Figure 4.** Pruritic papules of sarcoptic mange in a pet owner.



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## K) Response to previous treatments

The most important aspect is their efficacy over time. Dose rates and durations of treatments are checked.

The response to steroid therapy is good in flea allergic dermatitis, superficial pyoderma, atopic dermatitis, and in the early stages of food allergies; it is partial or poor in chronic food allergies, demodectic mange, or *Malassezia* dermatitis.

The flea control strategy should be thoroughly and critically analysed. The latter is an essential element for diagnosis (exclusion of the diagnosis of FAD or louse infestation) and for the implementation of anti-parasitic control. The correct use of topical treatments is another element that is often overlooked.

Some shampoos are used repeatedly despite the fact that they provoke cutaneous inflammation at each use. Topical corticosteroids are sometimes used in large quantities, promoting the emergence of cutaneous infections.

Recording the administration of any medication is a useful way of determining causative agents if a toxic dermatitis is suspected or to diagnose cutaneous calcinosis following prolonged corticosteroid administration.

## L) Contagious nature

If there is apparent contagion (human or animal), the diagnosis is restricted to the detection and identification of sarcoptic mange, cheyletiellosis, dermatophytosis, or a massive flea infestation in the environment (**Figure 4**).

## 3. Diagnosis of pruritus in the dog

### > SUMMARY

Diagnosing pruritic dermatitis in the dog is a relatively simple matter provided one follows a rigorous approach, starting with eliminating parasitic and infectious causes.

It is essential to have a good working knowledge of first line diagnostic tests such as skin scrapes or surface cytology. Pruritus falls into one of two easily identifiable case presentations: pruritus present with lesions and without lesions.

### 1/ Clinical cases

#### A) Case 1

An 11-year-old West Highland White Terrier was presented for severe pruritic and painful dermatitis which began two months earlier with foot pads licking and lameness. This dog has no previous history of dermatological problems (**Figure 1**).

Through this short history what is the main differential? :

- Allergic dermatitis
- Hepatocutaneous syndrome
- Neoplasia

The breed, age and description of lesion tended to minimize the allergic hypothesis. First line diagnostic tests were biochemistry, skin biopsies and ultrasound.

#### B) Case 2

An owner called the clinic for his 1.5-year-old Cavalier King Charles which was scratching its neck when the lead or leash was pulled. This short description leads already to one differential:

- Behavioural disorder
- Syringomyelia

**Figure 1.** Hepatocutaneous syndrome in a West Highland White Terrier : severe pedal and facial lesions.



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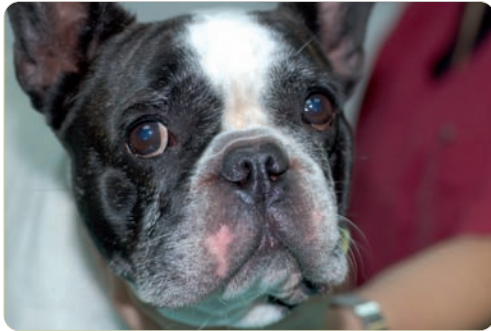


**Figure 2.** Syringomyelia in a Cavalier King Charles: pruritus is provoked by lead pulling.



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**Figure 3.** Atopic dermatitis in a French bulldog: facial erythema.



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**Figure 4.** Pruritic nodular lesions of the face of a Dogue de Bordeaux with mucocutaneous lymphoma.



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- Allergic pruritus
- Flea infestation

Breed, location of lesion and description of severe pruritus were highly suggestive of syringomyelia (**Figure 2**).

### C) Case 3

A 1-year-old French bulldog is presented for feet licking and recurrent otitis both steroid responsive (**Figure 3**). What is your first differential?

- Atopic dermatitis
- Sarcoptic mange
- Demodicosis
- Pyoderma

This history includes 3 major diagnostic criteria of canine atopic dermatitis, therefore it will probably be the first hypothesis.

## 2/ Pruritus with lesions

If the pruritus is associated with skin lesions, the potential causes are far more varied and localisation alone is not always enough to narrow down the differential diagnosis.

Identifying the type of lesions is the first essential step. If the lesions are nodular or ulcerated (**Figures 4 and 5**), cytology and histopathology are always indicated as a first line examination. Such examinations could be considered in first line in elderly animals with erythematous or scaly labial or trunk lesions to eliminate the hypothesis of cutaneous-mucosal lymphoma (**Figures 6 and 7**).

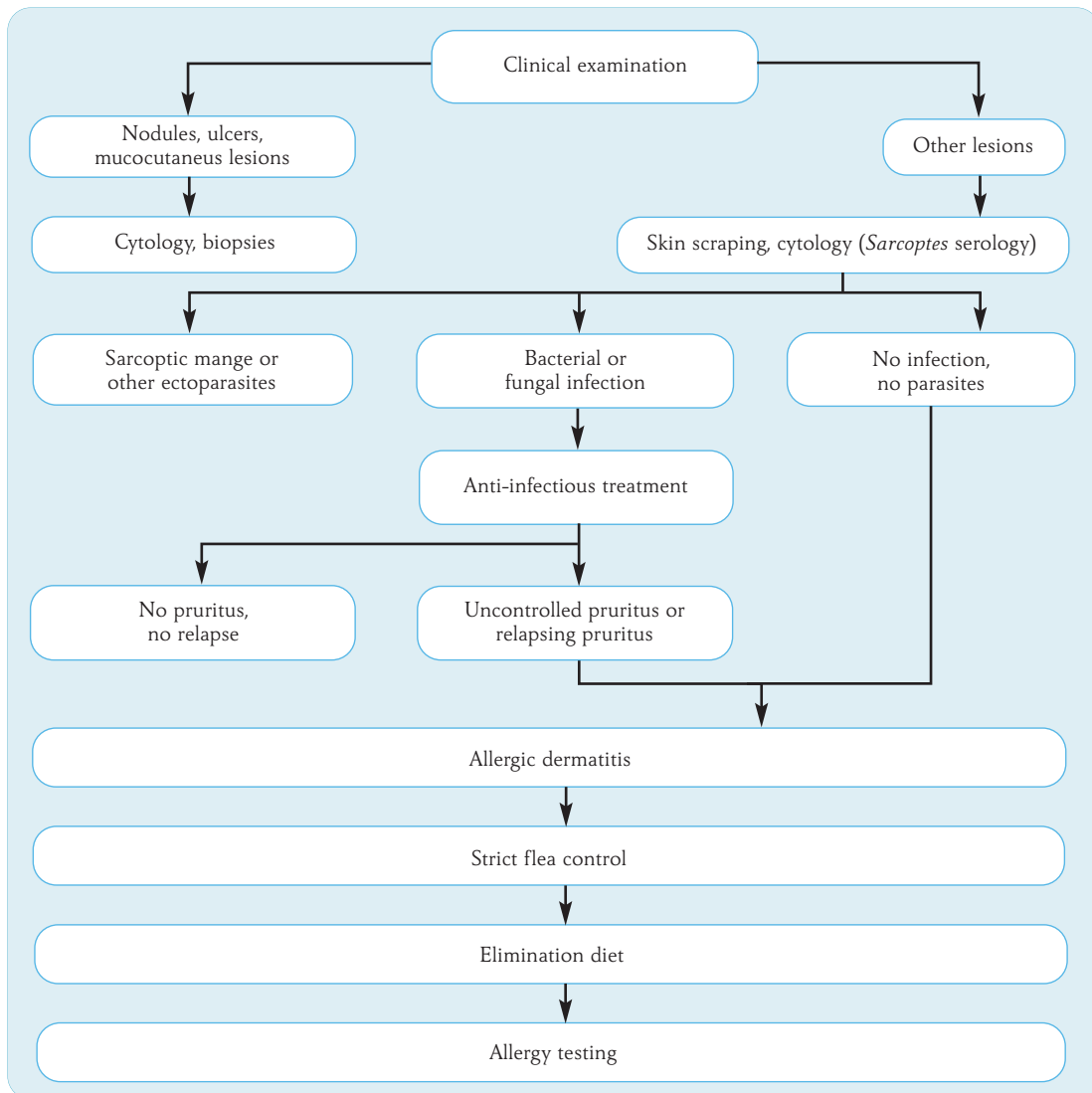
In other cases (erythema, papules, scales, crusts etc.) the diagnostic work-up involves looking for the three main causes of pruritus: infection, ectoparasites, and allergy. Unlike the commonly held belief, allergy tests are of no help in such cases.

The first step is to take skin scrapes and perform surface cytology.

### A) Isolating ectoparasites

If ectoparasites are found (fleas, *Sarcoptes*, *Demodex*, *Cheyletiella* spp., *Neotrombicula autumnalis*, etc.), appropri-

Figure 5. Dog with lesional pruritus.



### When to take a biopsy?

- It may be tempting to take skin biopsies to determine the origin of pruritic dermatitis. However, other than in rare cases of neoplasia, metabolic, or autoimmune disease, histopathology is often uninformative in such cases and may lead to diagnostic errors. Indeed, the existence of perivascular dermatitis is a classic pattern in cases of allergic dermatitis, but it is by no means diagnostic. It cannot be used to exclude the existence of a bacterial or fungal infection or infestation with ectoparasites.
- Biopsies are therefore primarily indicated in elderly dogs with suspected cutaneous-mucosal lymphoma, and in cases with nodular or ulcerated lesions. In second line, biopsies can be used for scales (suspicion of granulomatous sebaceous adenitis), crusting, or pustular lesions.
- If possible, exclude secondary infection (bacteria, *Malassezia*) before taking a biopsy.

**Figure 6.** Ulcerative lesions of mucocutaneous pyoderma in a Yorkshire terrier.



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**Figure 7.** Truncal lesions of mucocutaneous lymphoma in a Yorkshire terrier.



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iate treatment should be given and the animal reassessed 3 to 4 weeks later. If you don't find them, a diagnostic therapy can be considered.

### B) Strong suspicion of mange

Even if the parasite is not found on direct examinations, Sarcoptic mange cannot be ruled out, especially if the distribution of pruritus is highly suggestive: external aspect of the elbows, ear pinna, face. Serological testing can be useful in such cases to confirm the diagnosis. If this is not available, a therapeutic trial can be instigated (e.g. selamectin/3 treatments with an interval of 15 days, moxidectin spot on, milbemycin oxime *per os*, amitraz lotion).

### C) Bacterial or fungal infection

If a superficial pyoderma or *Malassezia* dermatitis is diagnosed, it should be treated to determine whether it is the cause of the pruritus or if pruritus persists once the dermatitis has resolved. The animal should therefore be reassessed 2 to 3 weeks after appropriate anti-microbial treatment.

### D) Absence of infection or ectoparasites

In the absence of infection or ectoparasites, or if the pruritus persists once the infection is under control, an allergic origin should be considered. The diagnosis of flea allergy derma-

**Table 1.** Diagnostic criteria for canine atopic dermatitis (Favrot 2010).

• First symptoms before 3 years of age	• Affects the toes of the forelimbs
• Essentially indoor life	• Affects the ear pinna
• Pruritus responds to steroid treatment	• Absence of lesions on the edges of the ear pinnae
• The pruritus is present before any lesions	• Absence of dorsolumbar lesions

If 5 criteria are fulfilled, the sensitivity of diagnosing CAD over another cause of chronic pruritus is 85% with a specificity of 79%. If 6 criteria are fulfilled, the specificity is 89%, but the sensitivity falls to 58%.

These criteria must not be used as an absolute tool to diagnose CAD (sensitivity and specificity are not perfect), but as a help in the diagnosis of classical form of the disease.

**Table 2.** Localisation of pruritus and its interpretation. This table helps to choose which test to do first.

Localisation	Cause	Frequency	Indicative elements
Face	• Allergic dermatitis	+++	• Face and feet involved, responds to steroids
	• <i>Malassezia</i> dermatitis (lips)	+	• Breed predisposed to Atopic Dermatitis (AD)
	• Otitis externa	++	• Head shaking
	• Otitis media, polyps	+	• Head shaking
	• Aujeszky's disease	-	• Sudden onset, extremely violent pruritus
	• Behavioural disorders	+	• Precise circumstances surrounding onset
Neck, shoulder	• Syringomyelia	+++	• Breed (Cavalier King Charles, Yorkshire terrier, French bulldog)
	• Fleas	-	• Absent or inadequate flea treatment, lives with cats
Extremity of the limbs (excluding paws)	• Peripheral nervous irritation	-	• History of trauma, breed in young animals (German pointer, French spaniel)
	• Behavioural disorders	+	• Breed, circumstances surrounding onset
Base of the tail	• Flea Allergy Dermatitis (FAD)	+++	• Primarily concentrated around the base of the tail
Tip of the tail	• Behavioural disorders		• Triggering circumstances
Flanks	• Flea Allergy Dermatitis (FAD)	+++	• Absent or inadequate flea treatment, lives with cats
	• AD (atypical form)	+++	• Especially in Scandinavian breeds
	• Behavioural disorders	+	• Doberman, circumstances surrounding onset and triggering factors
Back	• FAD or lice	+++	• Absence or inadequate ectoparasite treatment, lives with cats
	• Vertebral pain, herniated disc	-	

titis relies on the observation of lesions or pruritus in the dorso-lumbar region, whilst atopic dermatitis is associated with various specific epidemiological and clinical criteria (**Table 1**).

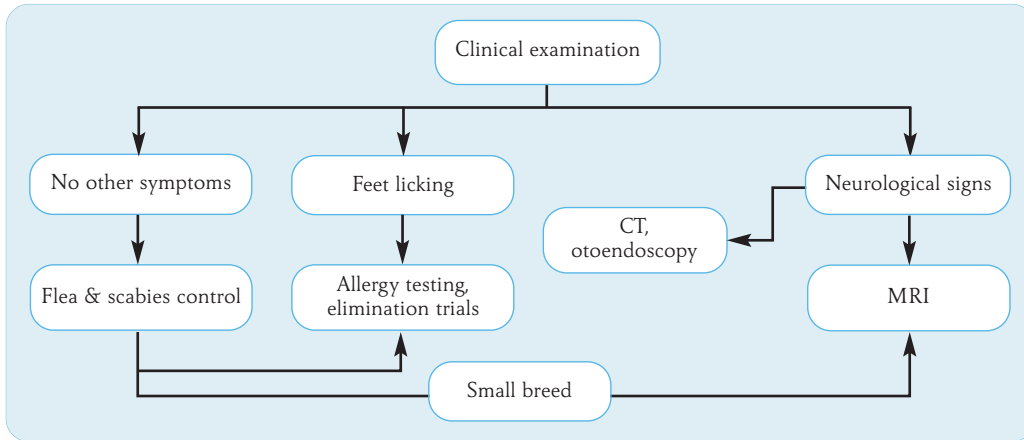
The other cases are likely to be suffering from an atypical allergic dermatitis, in which the allergen may be food or airborne allergens.

The first step is therefore to instigate rigorous antiparasitic treatment and control of secondary infections to narrow the differential diagnosis and limit secondary causes of pruritus. If there is no response to this treatment, an elim-

ination diet is implemented over a period of at least one month (ideally 8 weeks).

Allergy tests are only indicated to obtain an aetiological diagnosis for atopic dermatitis and select an appropriate desensitisation programme.

Therefore the diagnosis of allergic dermatitis is mainly made by elimination of ectoparasite cause of pruritus and observation of criteria obtained from history and clinical examination without allergy testing. This concept which is largely used in human medicine is now more and more widely used in canine dermatology.

**Figure 8.** Dog with non-lesional pruritus.

### 3/ Pruritus without lesions

The principal causes of pruritus that starts before the onset of lesions are summarised in **Table 2**. The first step is to determine the localisation of the pruritus as this often provides a valuable diagnostic clue (**Figure 8**). It is also important to take a detailed history from the owner. These initial observations will guide the choice of further diagnostic tests such as skin scrapes, cytology, serology for scabies, and in many cases of cervical pruritus or of the extremities, a neurological examination combined with an EMG (pruritus of the extremities of the limbs) or MRI (suspicion of syringomyelia).

### 4/ Highly specific indicative signs for specific diseases

Although in dermatology, pattern recognition is rare, some diseases are an exception, but you should work out a dia-

gnosis. Certain symptoms or lesion distribution patterns are highly suggestive of specific causes of pruritus. The most common examples are:

- Pruritus of the shoulder or neck in a Cavalier King Charles: syringomyelia,
- Hyperhidrosis (excessive sweating in the absence of stress): atopic dermatitis,
- Chronic otitis externa: atopic dermatitis,
- Flank sucking in Dobermans (behavioural disorder),
- Dorsolumbar pruritus: FAD,
- Licking and chewing the tip of the tail: behavioural disorder,
- Pinnal-pedal reflex: sarcoptic mange, but also commonly observed with *Malassezia* otitis with lesions on the ear pinna,
- Crusty, pruritic lesions on the free margin of the ear pinnae: sarcoptic mange.

## 4. Microscopic diagnosis of ectoparasites

### > SUMMARY

There are three very useful techniques for ruling out ectoparasites infestations in a pruritic dog:

- Skin scraping
- Examination of plucked hair
- Adhesive tape examination

They require some experience but enable definitive diagnosis.



### 1/ Case study: 18-month-old Bull Terrier bitch

The dog had been scratching, biting and rubbing herself against objects intensely for the last six months. She has been given several oral antibiotic courses, which, according to the owner, were to treat the presence of "bacterial infections". Initially there was a good clinical response with a reduction in the skin lesions and pruritus, but later it was observed that there was no longer any response to treatment. A 6-week low-allergy diet based on hydrolysed proteins did not eliminate the pruritus or the skin lesions. Therefore, a clinical diagnosis was made of atopic dermatitis and treatment was commenced with cyclosporine at a dose of 5 mg/kg orally on an empty stomach once daily.

At presentation, and despite the 4-weeks of cyclosporine treatment, the patient had diffuse and intensely itchy skin lesions.

The dog appeared to be healthy, was fully vaccinated and was given monthly anti-parasite prophylaxis using imidacloprid spot-on.

The general physical examination did not show any abnormal changes apart from mildly enlarged popliteal lymph nodes.

The dermatological examination showed hypotrichosis with erythema and excoriation on the side of the body and extremities (**Figures 1 and 2**) and erythematous macules and papules throughout the underside of the body (**Figure 3**). The patient also presented alopecia with haemorrhagic crusts on the pinna margins (**Figure 4**) and had a positive pinna-pedal reflex when the ear margins were rubbed.

### What diagnostic and/or therapeutic steps do you suggest?

1. Add 22 mg/kg cephalexin twice daily to current treatment.
2. Increase the cyclosporine dose to 5 mg/kg twice daily.
3. Perform a skin biopsy for dermatohistopathological examination.
4. Perform multiple microscopic examinations of hair and superficial and deep skin scrapes, and perform a cytology examination of the papules.

Based on the clinical symptoms observed (papular dermatitis, dermatitis with scabs on the margins of the pinna and severe pruritus) and the dog's clinical history (pruritus that is unresponsive to cyclosporine used at the correct dose), the most likely differential diagnoses are, in this order:

**Figure 1.** Hypotrichosis with erythema, general view of the young pruritic Bull Terrier.



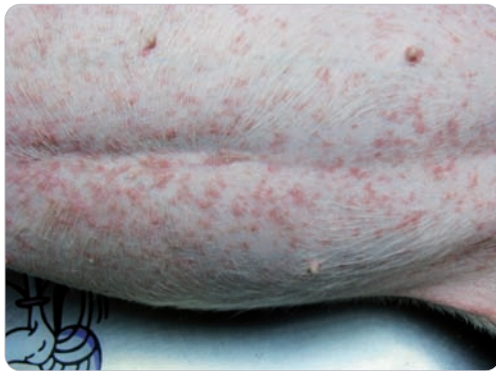
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**Figure 2.** Hypotrichosis, erythema and excoriation on the side of the body.



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**Figure 3.** Erythematous macules and papules throughout the underside of the body.



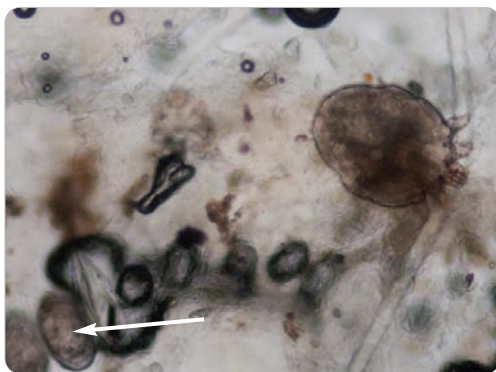
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**Figure 4.** Alopecia with haemorrhagic crusts on the pinna margin.



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**Figure 5.** Adult of *Sarcoptes* mite and few eggs (arrow).



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1. Sarcoptic mange,
2. Generalised demodicosis,
3. Atopic dermatitis,
4. One of the above with superficial pyoderma (bacterial folliculitis).

In a dog with pruritus, and in particular if pruritus is intense, it is essential to rule out parasitic skin diseases, mainly superficial mites such as *Sarcoptes* and *Cheyletiella*, before a final diagnosis of allergic dermatitis is made.

Multiple microscopic examinations were performed on hairs plucked from the side of the body and the side of the extremities, which did not reveal the presence of parasites. Superficial scrapes were taken of some abdominal papules

and ear margins, which confirmed the presence of mites that were consistent with *Sarcoptes scabiei* (Figure 5). Finally, an impression cytology technique was used to examine the surface of one of the partially-eroded papules. This showed the presence of some neutrophils and eosinophils and absence of cocci.

#### Final diagnosis → Sarcoptic mange

Acaricide treatment was prescribed with one selamectin spot-on application every 21 days, three times, associated with a topical antiseptic treatment with a 3% chlorhexidine-based shampoo every 7 days. The cyclosporine treatment was discontinued. After 40 days the pruritus and skin lesions had resolved.

## 2/ Microscopic diagnosis of common ectoparasites

The techniques used to diagnose ectoparasites caused by superficial and deep mites are skin scrapes (superficial and deep), microscopic examination of plucked hair and adhesive tape impression examination. These are basic complementary tests that are simple to perform and they provide immediate information. For this reason they should be routinely used at dermatology consultations of dogs with pruritus.

### A) Indications

#### These tests are particularly indicated:

- To confirm the diagnosis of ectoparasitic diseases caused by superficial or follicular parasites (mainly sarcoptic mange, cheyletiellosis and demodicosis).
- If there are signs or lesions suggestive of: pruritus, erythematous macules and papules, crusts, scaling, follicular pustules, multifocal alopecia, follicular casts, comedones.

#### Furthermore, the plucked hair microscopic examination permits:

- Determination of hair growth phase,
- Examination of hair morphology,
- Detection of arthrospores and dermatophyte hyphae on the hair shaft.

### B) Material required

- Scalpel blades, n° 10 or 20,
- Curved haemostatic forceps,
- Adhesive tape, ideally Scotch® Crystal Clear Tape, 3M,
- Curved scissors or razor,
- Moisturising agents: mineral oil such as liquid paraffin,
- 10% KOH,
- Ground-edge slides,
- Cover glasses (slides),
- Pencil or permanent pen to mark the slide with the case name and the body area of sample,
- Disinfectant,
- Microscope.

### C) Sample collection techniques

#### 1) Superficial skin scrapes

This technique is used to identify superficial mites such as *Sarcoptes scabiei* and *Cheyletiella* spp. There are usually only a small number of superficial mites, especially in the case of sarcoptic mange, and so test sensitivity is low (about 50%). Therefore, this test should not be used to rule out the disease.

#### A few tips to increase the diagnostic sensitivity of this test:

- Perform several scrapes (at least 4-6). This increases the amount of skin surface examined and improves the possibility of finding parasitic agents.
- Choose appropriate lesions and areas for sampling. Thus, if cheyletiellosis is suspected, collect the characteristic whitish scales that are found in this disease (Figure 6). If sarcoptic scabies is suspected, samples should be taken from skin areas that are not too exposed to the dog's scratching (pinna margins, elbows) because these areas are likely to have more mites. If there are papules, the papule surface is the best area for scraping, because each papule represents a local lesion in response to the presence of the mite.
- Be sure of examining the whole sample.
- Avoid taking samples from areas covered with crusts that are particularly haemorrhagic or exudative, because the presence of debris and blood hinder the examination, and in highly traumatised areas there will be fewer parasites.

Before collecting the sample it is best to cut or shave the hair in order to remove structures that could hinder the



**Figure 6.** Characteristic whitish scales in the dorsum of a young Cavalier Charles King Spaniel with cheyletiellosis.



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**Figure 7.** Mineral oil has been placed on the ear margin of this young English bulldog with sarcoptic mange before superficial skin scraping has been made.



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**Figure 8.** The skin is being pinched between the first finger and thumb to help express the mites out of the hair follicle before doing a deep skin scraping.



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microscopic assessment of the sampled material. Place some mineral oil on the area to be sampled in order not to disperse the material (**Figure 7**). Use the scalpel to carefully scrape the area, trying to collect as many scales and/or crusts as possible. The sample should be spread on the slide like "butter on bread". The slide should be previously prepared with a small amount of mineral oil. Afterwards, the area that has been scraped should be disinfected with a surgical disinfectant.

## 2) Deep skin scrapes

This technique is used to identify parasites in the hair follicle such as *Demodex canis*. It is considered the test of choice to confirm or rule out the presence of demodicosis. The area to be sampled is prepared the same way as described for superficial scrapes, and the material used is also the same. The most significant differences in this technique are as follows:

- The sampling area is smaller than for a superficial scrape.
- It is recommended to pinch the skin between your first finger and thumb to help express the mites out of the hair follicle (**Figure 8**).
- The area should be scraped until there is mild capillary bleeding. This shows that the epidermis has been removed and the dermis is being scraped.

## 3) Microscopic examination of plucked hair

This test is used to identify *Demodex canis* and dermatophytes, and to assess hair shaft morphology.

The plucked hair test is considered as being less sensitive than deep scrapes in the diagnosis of demodicosis, especially in localised cases and when there are no complications from secondary pyoderma. However, it is particularly indicated for the assessment of areas where it is harder to perform deep skin scrapings (e.g. periorcular or perioral areas, interdigital spaces and perineal area).

### Tips for performing this test successfully and for increasing diagnostic sensitivity:

- Use the curved haemostatic forceps to firmly grip a group of hairs at their base - no more than 5-10 at a time - and then gently pull out the hairs in the direction of hair growth. Pull slowly and continuously to ensure that the peripilar keratin is removed together with the hair, because this is where the parasite is located (**Figures 9 and 10**).
- Take a good number of samples.
- In order not to break or deform the hair at the point of contact with the forceps, you may pluck out the hair with your fingers or with rubber-tipped forceps. This is espe-

**Figures 9 and 10.** The hair should be pulled slowly and continuously to ensure that the peripilar keratin is removed together with the hair for its microscopical examination.



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cially useful if the aim of the microscopic examination is to diagnose changes in hair shaft morphology.

- After plucking out the hairs, place them in the mineral oil on a slide, carefully positioning them in parallel in order to examine them more easily.

#### 4) Adhesive tape examination

This technique is mainly used to detect parasites that move on the skin surface, especially *Cheyletiella spp.* It is also particularly useful for showing the owner the fleas or lice that are infesting his/her pet, because the parasites get trapped on the tape.

The procedure consists of using a piece of transparent adhesive tape to collect scales attached to the animal's skin and/or hair, brushing the hair beforehand in order to loosen the scales. Any scales that have fallen off onto the examination table can also be analysed. The tape should

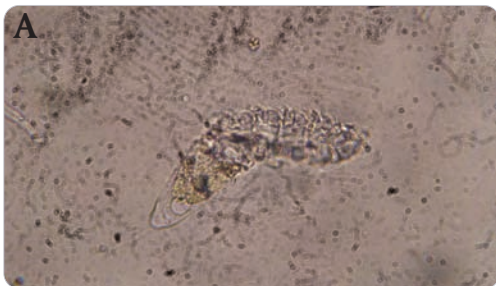
then be carefully stuck onto the slide, trying to avoid creases, and then it can be observed under the microscope.

#### D) Examination of the sample

An alternative to liquid paraffin is 10% potassium hydroxide (10% KOH). It dissolves the scales in the sample and improves visibility. However, unlike the oils, it kills the parasites and so they can be overlooked as they will no longer be mobile. The use of KOH is mainly recommended to identify dermatophytes, because it is easier to differentiate the spores from peripilar keratin on the hair shaft.

After preparing the slides with the samples collected using the techniques described above, the samples are covered with a cover glass (slide) (except in the case of the adhesive test tape) to improve quality of vision and are carefully examined under a microscope. Care should be taken to partly close

**Figures 11.** **A)** Microscopic examination of (one cadaver of) *Demodex canis* using the diaphragm partially closed (100x). **B)** Microscopic examination of the same *Demodex* using the diaphragm opened. Note that the amount of light reduces the contrast and the mite become almost transparent and invisible (100x).



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the microscope diaphragm, as this will reduce the amount of light and increase the contrast (too much light can reduce sensitivity because the mites become almost transparent and invisible (**Figures 11 a and b**)).

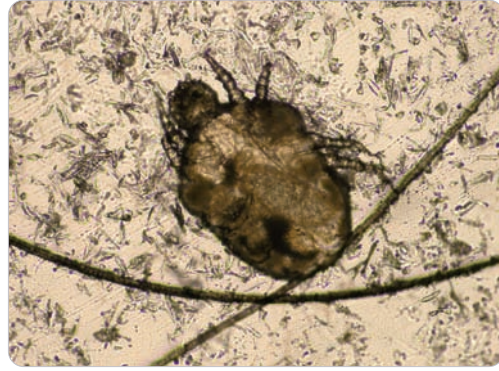
Mites and their eggs are easily seen under low-power magnification (20x-40x). Furthermore, the whole sample will be visible when low-power magnification is used, thus saving time. It is sometimes useful to use medium-power magnification (100x) to check details of material that has been viewed under low power.

### E) Interpretation

No mites should be found in healthy animal samples. This is particularly true for superficial mites, when the presence of even a single adult mite or a single egg of *Sarcoptes* or *Cheyletiella* is considered to be diagnostic of the disease (**Figure 12**). However, the presence of a single specimen of *Demodex* makes the diagnosis questionable. Although *Demodex canis* may inhabit the skin of healthy dogs, the probability of finding them by chance is very low (5.4% of healthy dogs may have *Demodex canis* in a microscopic hair examination). Therefore, the finding of a single mite could suggest the presence of demodicosis and it warrants further deep scrapes or microscopic hair examinations (**Figure 13**). Rarely, a longer form of *Demodex*, namely *Demodex injai*, might be observed on the skin surface of dogs, especially on the dorsal surface of allergic Terriers (**Figure 14**).

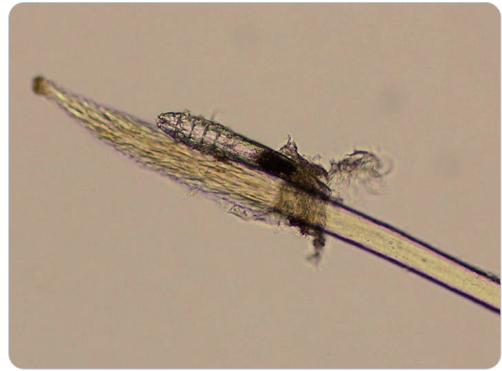
Occasionally, macroconidia from ambient saprophytic fungi, pollen or pieces of tissue fibres may be observed in the lesion samples as a result of ambient contamination.

**Figure 12.** Adult of *Cheyletiella* observed during examination of an adhesive tape examination (40x).



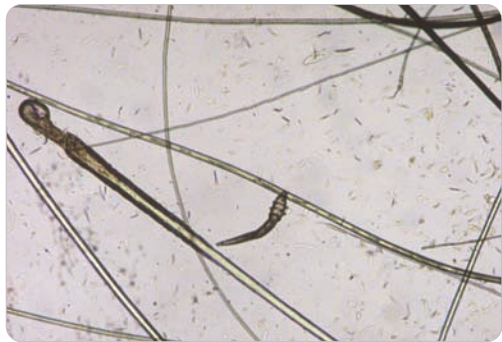
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**Figure 13.** Adult mite of *Demodex canis* next to the hair bulb within the peripilar keratin (100x).



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**Figure 14.** Adult mite of *Demodex injai*. Note the characteristic long opisthosoma (40x).



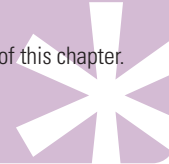
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## 5. Superficial skin cytology

### > SUMMARY

Superficial skin cytology is one of the most useful test in dermatology because it is simple, quick and inexpensive. The authors review the indications, the different samplings, their preparation, examination and interpretation with useful tips.

Finally, all the reasons to acquire a microscope and how to use it are listed in a box at the end of this chapter.



### 1/5-year-old German Shepherd cross, neutered bitch

At presentation the dog had intense pruritus in its face, paws and groin that was not responding to prednisone (0.5 mg/kg once daily).

Apart from the dermatology problem, the dog was apparently healthy, fully vaccinated and was given spot-on flea prophylaxis irregularly (every two months and only in summer).

The general physical examination did not show any abnormal changes, while the dermatological examination showed alopecia with erythema and crusts in the skin of the lower lips (**Figure 1**), erythema in the palmar interdigital spaces of the forelegs and perianal area (**Figures 2 and 3**) and erythema with hyperpigmentation and mild lichenification on the abdomen and groins (**Figure 4**).

### What diagnostic and/or therapeutic steps do you suggest?

1. Commence allergen-specific immunotherapy immediately.
2. Increase the prednisone dose to 0.5 mg/kg twice daily.
3. Administer cyclosporine A orally at a dose of 5 mg/kg once daily.

**Figure 1.** Alopecia with erythema and crusts in the skin of the lower lips of this patient with seasonal pruritus.



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4. Perform a cytology examination of the surface of the affected areas and also multiple microscopic examinations of hair and superficial skin scrapes.

Based on the clinical symptoms observed (pruritic erythematous dermatitis of the face, paws and abdomen) and the dog's clinical history (seasonal atopic dermatitis), the most likely differential diagnoses are, in this order:

1. Atopic dermatitis (seasonal or otherwise) with or without:
  - a. Superficial pyoderma and/or *Malassezia*-induced dermatitis,
  - b. Flea infestation,
  - c. Flea bite-induced allergic dermatitis (this is unlikely due to the absence of dorsal-lumbar pruritus and specific IgE against flea-saliva allergen in the serology test).

**Figure 2.** Erythema in the ventral interdigital spaces of the forelegs.



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**Figure 3.** Same dog, with erythema in the perianal area.



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2. Sarcoptic mange (unlikely because the distribution of the pruritus is not consistent with this).
3. Demodicosis (unlikely due to the presence of pruritus and only moderate alopecia).

The clinical manifestations of patients with atopic dermatitis are often exacerbated by the presence of factors that are considered to aggravate or trigger allergic inflammation. In dogs, these factors are typically skin infections caused by *Staphylococcus* and *Malassezia*, fleas and food allergens.

Therefore, in dogs with atopic dermatitis, it is necessary to identify and control these factors before deciding on a specific treatment option for the allergic reaction (anti-inflammatory treatment or prophylaxis with specific allergen immunotherapy).

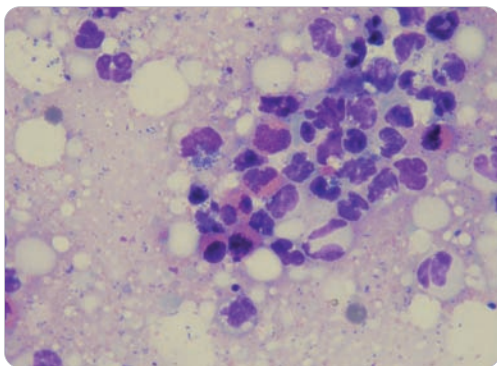
Microscopic examinations on plucked hair and superficial skin scrapes did not reveal the presence of parasites. Brushing to look for fleas did not show the presence of adult fleas or faeces. In addition, direct impression samples

**Figure 4.** Same dog, with erythema with hyperpigmentation and mild lichenification on the abdomen and groins.



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**Figure 5.** Cytological examination from an impression of the skin surface shows abundant neutrophils with eosinophils and intracellular cocci (Diff Quick, 1000x).



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**Figure 6.** Same dog than in **Figure 4** after treatment.



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**Figure 7.** Same dog than in **Figure 1** after treatment.



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were taken of the abdominal skin and adhesive tape impressions of the skin on the lip and interdigital spaces for cytology examination, showing the presence of abundant neutrophils with some eosinophils and intra-cellular cocci in all samples (**Figure 5**).

**Final diagnosis** —> **Superficial pyoderma**

Empirical antibiotic treatment was commenced with oral cephalixin (22 mg/kg twice daily) along with baths using a 3% chlorhexidine-based shampoo every 2-3 days. A parasitocidal treatment was also commenced with a selamectin-based spot-on application every 21 days. At 21 days, the clinical response was excellent with almost complete absence of lesions (**Figures 6 and 7**) and highly notable reduction in pruritus, suggesting a final diagnosis of superficial pyoderma secondary to seasonal atopic dermatitis. It was not necessary to prescribe any anti-inflammatory treatment to control the clinical symptoms and no recurrence of pruritus was observed until the following year, and so it was not necessary either to commence allergen-specific immunotherapy.

## 2/ Superficial skin cytology examination (non-neoplastic skin cytology)

Superficial skin cytology examination is a very valuable

test in veterinary dermatology practice. It provides very useful information in a short space of time so that an action plan can be made quickly (*e.g.* deciding between empirical antibiotic therapy or performing a culture and antibiogram).

It permits inflammatory and neoplastic cell types to be defined and microorganisms to be identified.

### A) Indications

A superficial skin cytology examination is indicated in all conditions that present:

- Papules, pustules and/or epidermal collarettes.
- Erosions, ulcers and/or crusts.
- Dry or oily scale.
- Increased secretions or exudate present in the ear canals.

In addition, in dogs with facial pruritus, cytology examination of conjunctival mucosa may be indicated if there is:

- Congestion.
- Presence of mucopurulent discharge.

### B) Material required

- Curved scissors,
- Sterile 25-gauge needles,
- Transparent adhesive tape, ideally Scotch® Crystal Clear Tape, 3M,
- Scalpel blades, n° 10 or 20,
- Cotton-tipped swabs,
- Ground-edge slides,

**Figure 8.** Intact pustule in a Doberman with bacterial folliculitis.



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**Figure 9.** Epidermal collarette in a Labrador with superficial pyoderma.



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**Figure 10.** Ulcer in a dog with deep pyoderma.



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- Pencil or permanent pen to mark the slide with the case name and the body area of sample,
- Lighter,
- Rapid staining,
- Cover glasses (slides),
- Microscope,
- Immersion oil.

### C) Sample collection techniques

Different techniques exist and the choice depends on the type and location of the lesion. For example, samples to be taken in areas that are hard to access (skin surface of the ear canal, skin folds, interdigital spaces, perianal area) can be obtained more easily with the adhesive tape technique or a swab.

The different techniques are described below, specifying the lesions for which they are indicated.

#### 1) Direct impression smear

This technique is used for flat, accessible body areas in the presence of:

- Pustules (**Figure 8**),
- Epidermal collarettes (not very chronic, when exudate is still present) (**Figure 9**),
- Erosions, ulcers or surfaces underneath a haemorrhagic crust (**Figure 10**).

This technique involves directly pressing the slide gently on the affected skin surface. Before collecting the sample it is best to cut the hair surrounding the lesion with scissors.

If pustules are intact they should be gently broken with the 25-gauge needle. The purulent material found is then collected by gently pressing the slide on the surface. This procedure may be repeated several times in order to collect a lot of samples from the same pustule.

Crusts, if present, must be lifted with a fine-gauge needle to expose the surface exudate. In the presence of erosive-ulcerative lesions, it is recommended to dry the exudative surface by rubbing it and then collect fresh exudate.

#### 2) Collection with a cotton-tipped swab

This technique is used to collect the following samples:

- Secretions inside the ear canals,
- Exudate from fistula tracts (**Figure 11**),

- Exudate present in the interdigital spaces or between skin folds (**Figure 12**),
- Conjunctiva (muco-purulent material present in the conjunctival sac in dogs with suspected allergic conjunctivitis).

It consists of collecting the exudate by exerting moderate pressure. The swab is then rolled gently on the slide.

### 3) Collection using adhesive tape

This technique is used to sample skin areas that would be hard to reach using a direct impression smear technique (interdigital spaces, eyelids, lips or perianal area).

It is ideally used in the presence of oily scale in order to identify the presence of *Malassezia* on the skin surface (**Figure 13**).

The technique consists of cutting a 3-5 cm strip of adhesive tape and pressing one end moderately but repeatedly on the surface to be sampled. After collecting the sample, the other end of the adhesive tape is stuck to the slide, leaving the end with the sample free for staining. These samples are stained directly, without using the alcohol fixative provided in the staining kit because the alcohol might remove the adhesive along with the sample from the tape. After staining, the tape is stuck to the slide with the sticky side down, avoiding making creases. The sample is examined under the microscope through the tape without needing a cover glass (slide).

### 4) Collection by means of superficial scrape

This technique is indicated for:

- Oily scale,
- Lichenification (**Figure 14**),
- Ulcers with thickened margins.

It consists of scraping the skin surface with a number 10 or 20 scalpel blade. In lichenified areas it is advisable to spread out the skin by stretching it between your first finger and thumb to expose the skin surface that is hidden in the folds. Once obtained, the material is spread on the slide like "butter on bread".

### D) Fixing and staining of samples

In all cases, the slide should be marked with the case name and the site or lesion where the sample was taken from.

**Figure 11.** Bacterial pododermatitis with fistula tracts.



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**Figure 12.** Exudate in the nasal skin fold.



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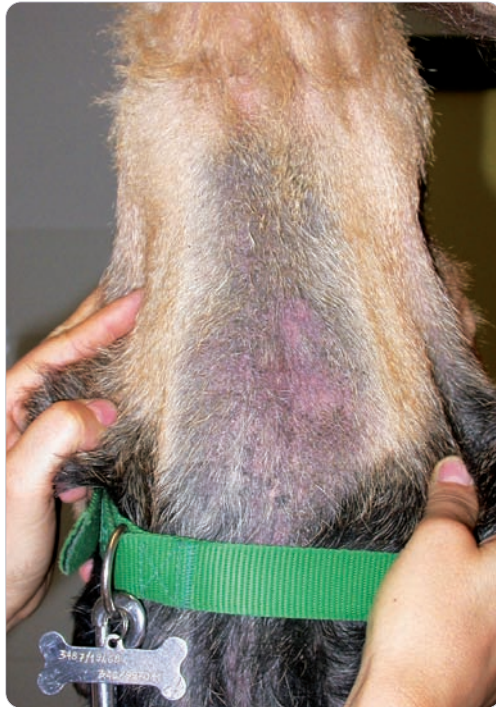
**Figure 13.** Oily scales in a dog with *Malassezia* dermatitis.



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**Figure 14.** Lichenification of the ventral part of the neck in a dog with *Malassezia dermatitis*.



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Most samples should be air dried, except for samples collected using adhesive tape, which can be stained directly. However, for very oily samples (ear wax secretions, oily scale) it is recommended to heat fix them before immersion into alcohol. To do this, simply pass a flame a couple of times some two centimetres' distance under the slide (on the opposite side from the sample).

The most commonly used stain in clinical practice is the Diff Quick stain. It is a Romanovsky-type panoptic stain that makes it possible to differentiate basophilic and acidophilic areas in a preparation, for the purpose of cytology study. Its main advantage over other similar types of stains is that it is simple and quick to perform (15-30 seconds). However, the quality is slightly lower than stains such as the May-Grundwald-Giemsa stain or Wright's stain that are used in diagnostic laboratories, especially for cytological preparations of neoplastic lesions.

The sample is immersed for 5-10 seconds in each step (1-fixation, 2-red dye, 3-blue dye). Between each step, the excess liquid should be allowed to drain onto a paper towel. After staining, the samples are rinsed rapidly under running water and left to air dry in a vertical position for later examination.

#### Tips for maintaining the staining kit in good condition:

- Number the bottle caps (1, 2 and 3): this should avoid mixing the caps up and staining the fixative with remnants of dye that may be left in the cap.
- Close the bottles immediately after use: this should prevent the volatile products from evaporating, with unnecessary product loss.
- Use two different fixative and dye kits: one for "clean" samples (e.g. nodule cytology, contents of intact pustules) and one for "dirty" samples (ear secretions, adhesive tapes, direct impressions, etc.).
- Filter the liquids regularly: this removes precipitate and sample remnants (wax, hairs).
- Change the kit regularly, depending on use, to prevent the formation of precipitate in the samples and to preserve the staining quality.

#### E) Examination of the sample

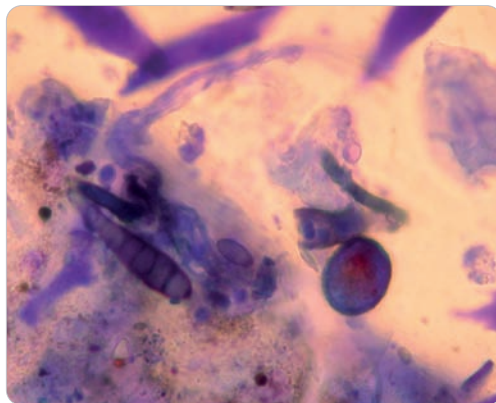
The samples are initially examined at low magnification (40x) to determine the sample area that contains the best characteristics to study (staining quality, high cellularity, single sample layer). Samples obtained by direct impression have the advantage of not misshaping the cells, although sometimes the material is too dense. In these cases it is recommended to identify outlying areas in the sample where it is possible to examine a single cell layer. Examination with low-power magnification permits larger structures to be observed, such as *Demodex* (Figure 15) or fungal spores (Figure 16), which could be overlooked if the examination were started at a higher magnification. However, by moving up to a higher magnification (100x), the entire cell population can be seen, evaluating signs of inflammation and selecting areas on the slide that seem to be the best for studying at a higher magnification (400x). Under high magnification, cell components can be clearly defined, and some microorganisms (yeasts and bacteria) can be identified. Finally, the sample is examined using maximum magnification (1000x, in oil immersion), which is indicated

**Figure 15.** Cytological examination of the skin surface of a dog with pyoderma secondary to demodicosis (Diff Quick, 400x).



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**Figure 16.** Cytological examination of the skin surface of a dog with an adhesive tape. Note saprophytic macroconidia and a spheric structure compatible with pollen (Diff Quick, 400x).



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for identifying infectious agents accurately (e.g. *Leishmania* and small bacilli) and cell details.

To conserve samples for a long period, they should be covered with a cover glass mounted with special glue (Eukitt), and they should be protected from the light. In daily practice, and in the case of samples that do not have to be kept, it is still recommended to cover the sample with a cover glass, placing a drop of liquid paraffin between the sample and the cover glass. This improves the quality of the image when examined at low (40x), medium (100x) or high (400x) power.

## F) Interpretation

### 1) Normal findings on the skin surface

- Keratinocytes are mostly enucleated (corneocytes) and a smaller proportion is nucleated. Frequently melanin granules are seen on the surface of epithelial cells (**Figure 17**).
- A small number of cocci and *Malassezia* may be present. Numbers vary depending on the breed, sample site, and the technique used. For example, a Basset Hound has numerous *Malassezia* without any evident clinical signs. Although there is no broadly-defined number of microorganisms that is considered normal in canine healthy

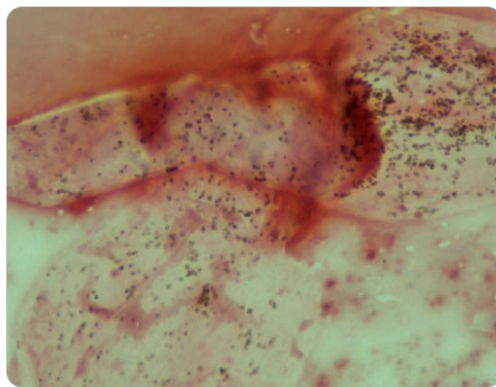
skin, it is commonly agreed that the maximum number of observable cocci is <2 per immersion field (1000x), and <1-2 per dry field (400x) for *Malassezia*.

- Absence of bacilli,
- Absence of inflammatory cells.

### 2) Normal findings on the skin surface of ear canals

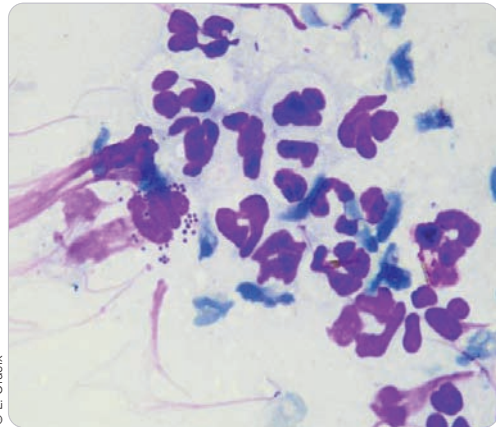
- Enucleated and nucleated keratinocytes,
- <5 cocci per immersion field (1000x),
- <4 *Malassezia* per immersion field (1000x),

**Figure 17.** Melanin granules on the surface of a keratinocyte (Diff Quick, 400x).



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**Figure 18.** Neutrophilic inflammation with numerous intracellular cocci diagnostic of pyoderma (Diff Quick, 1000x).



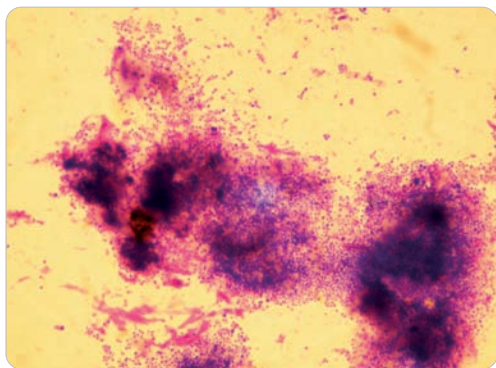
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- Absence of bacilli,
- Absence of inflammatory cells.

### 3) Normal findings of the conjunctiva

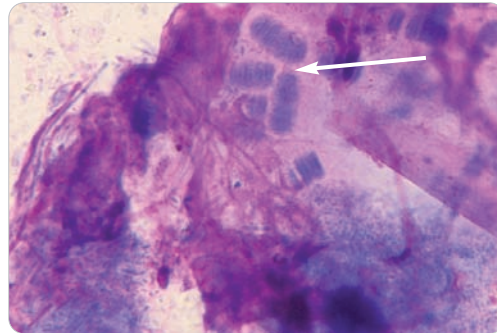
- Keratinised and non-keratinised epithelial cells,
- Lymphocytes,
- Neutrophils,
- A few cocci and bacilli.

**Figure 19.** Presence of an elevated numbers of cocci in the absence of inflammatory cells, diagnostic of bacterial overgrowth (Diff Quick, 1000x).



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**Figure 20.** Cytological examination from the skin surface of an atopic dog that licks continuously its feet. Note numerous and pleomorphic bacteria, originated from the oral cavity, in the absence of neutrophilic inflammation. Arrow, *Simonsiella* spp. (Diff Quick, 1000x).

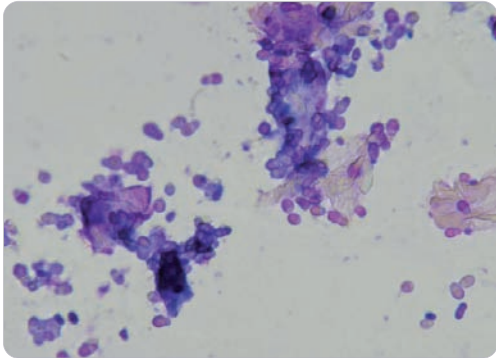


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### 4) Abnormal findings

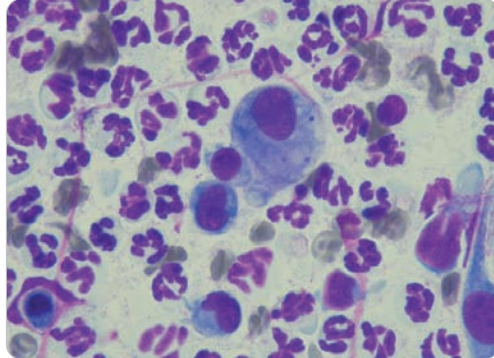
- The presence of degenerate neutrophils with intra-cellular cocci is diagnostic of bacterial infection (**Figure 18**).
- The presence of an elevated numbers of cocci or the presence of bacilli in the absence of inflammatory cells is diagnostic of bacterial overgrowth (**Figure 19**). This cytological diagnosis should be reached after an exhaustive examination of the sample to ensure absence of neutrophil and/or eosinophil granulocytes and of nuclear remnants that could suggest its presence. Cytological examination of pruritic areas where the dog licks may revealed bacteria from the oral cavity, without a pathological significance (**Figure 20**).
- The presence of an elevated number of *Malassezia* is diagnostic of overgrowth due to *Malassezia* (**Figure 21**).
- In general, when interpreting a sample and when significance should be given to the number of microorganisms in the absence of inflammatory cells (*i.e.* in microbial overgrowth), the clinical presentation should be taken into account. Atopic patients may develop a hypersensitivity reaction to components of bacteria or *Malassezia*. In such cases, even a very few organisms may be clinically relevant and cause inflammation and/or pruritus, and therefore anti-microbial therapy would be indicated.
- The presence of non-degenerate neutrophils and numerous acantholytic keratinocytes (keratinocytes with a large

**Figure 21.** Presence of an elevated numbers of yeast in the absence of inflammatory cells, diagnostic of *Malassezia* overgrowth (Diff Quick, 1000x).



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**Figure 22.** Cytological examination from dog with deep pyoderma. Note neutrophils, lymphocytes and macrophages, some of them showing phagocytosis of cocci and neutrophils (Diff Quick, 1000x).



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nucleus and rounded hyperbasophilic cytoplasm) in a sample collected from the contents of a pustule suggests the diagnosis of *pemphigus foliaceus*, which justifies carrying out a bacterial culture and biopsy to confirm that the lesion is sterile and to make the final dermatopathological diagnosis of *Pemphigus*.

- The presence of eosinophils in a cytology examination of superficial skin samples in dogs is uncommon and initially suggests allergic dermatitis and ectoparasitosis. Eosinophils may occasionally be seen inside pustules, suggesting an immune-mediated origin of the pustule,

such as *Pemphigus foliaceus*, *Pemphigus erythematosis* or sterile eosinophilic pustulosis.

- The presence of macrophages, lymphocytes or plasma cells together with degenerate neutrophils in a deep lesion sample (ulcers) suggests a deep pyoderma (furunculosis). In deep pyoderma there are very few bacteria and they are very difficult to identify (**Figure 22**).
- The presence of eosinophils and *Malassezia* in specimens collected in dogs with conjunctivitis is diagnostic of allergic conjunctivitis. In dogs with pruritus it is suggestive of atopic dermatitis.



## Principles of microscopy

- 🔬 Most basic complementary procedures used in veterinary dermatology that are performed to confirm a clinical suspicion, or at least reduce the list of possible differential diagnoses, require the use of a microscope.
- 🔬 You should invest in the purchase of a clinical diagnostic biological microscope for the following reasons:
  - To improve your professional practice: gaining access to immediate diagnostic information reduces the time required to complete a diagnostic-therapeutic protocol.
  - To increase profitability by reducing the number of tests sent to an external laboratory.
  - To show owners the aetiological agents causing their pet's problem, thus improving communication with owners in some cases.
- 🔬 The clinical biological microscope that you choose should be ergonomic, easy to use and is not too expensive (no more than 1000 euros and no less than 600 euros).
- 🔬 When you are looking to buy a biological microscope, it is useful to consider the following features:
  - Optical heads: the microscope may have a monocular or binocular head. Two heads are recommended, with adjustable interpupillary distance.
  - Magnification: this is the total magnification that results from multiplying the eye piece magnification, which is usually 10x, by the objective magnification (2x, 4x, 10x, 20x, 40x, 100x). The more powerful the magnification, the smaller the visual field.
  - Illumination: incident illumination should be used, *i.e.* bottom-up.
  - Stage: this is the square-shaped component that allows the slide holder to be moved by the millimetre.
  - Draw up a once- or twice-yearly cleaning service agreement with the microscope supplier to keep the microscope in a good condition.
- 🔬 Method:
  - In dermatology, most samples should first be examined with low-magnification objectives (2x - 4x). The condenser has to be lowered to improve the contrast. Parasites can now be identified and you can decide which areas of the slide you want to examine with higher-magnification objectives in order to identify infectious agents and cell details.
  - Scan the entire sample and always try to use the same method (*e.g.* from left to right and top to bottom and so on).
- 🔬 Clean the microscope every day after it has been used with lens wipes to remove traces of paraffin and/or oil immersion from the stage, condenser and objectives. If one of these liquids comes into contact with the dry objectives (<100x), quickly clean the objectives with lens cleaning tissues. Take special care when using solvents because they may damage the lenses.

## 6. Making treatment work

### > SUMMARY

Time is short in practice and treating pruritus in the dog often needs a multifactorial approach. This can be difficult to do in general practice so it is often easier to reach for the corticosteroids without attempting to make a diagnosis. The animal quickly improves but usually relapses once the treatment is stopped.

Treatment of pruritus in dogs should be considered on two levels:

1. Prior to diagnosis
2. Post-diagnosis



### 1/ Prior to diagnosis

Treatment prior to diagnosis should alleviate the discomfort of the dog without making diagnosis more difficult. This means that anti-inflammatory drugs such as corticosteroids and cyclosporine should be avoided if at all possible during this phase as they make diagnosis much more difficult.

It is important to clarify with the owner the areas where the dog is pruritic and then by a thorough examination of the dog deciding if the dog has a secondary microbial infection or not. The most common infections in dogs causing pruritus are staphylococcal pyoderma or *Malassezia* dermatitis. It is important to recognise pyoderma and *Malassezia* lesions in the dog and this has been discussed in the chapter "superficial skin cytology".

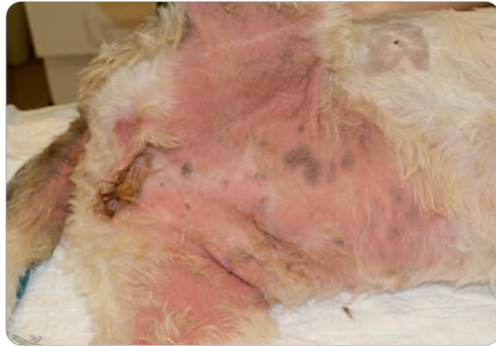
If a pyoderma is present it is important to treat for a minimum of 3 weeks and ideally one week past clinical cure. Longer treatments may be required especially if there is a deep pyoderma. Anti-inflammatories should not be given

at the same time. Many vets feel that anti-inflammatory use is necessary to help make the dog more comfortable but dogs not given anti-inflammatories often improve quicker than those who are. Other adjunct treatments can be used to help in this process such as shampoos.

Whenever a pyoderma is seen it is important for the clinician to remember that pyoderma is almost always secondary to an underlying problem. It is good at this point to make up a differential list as discussed previously. The most common causes of pruritus are allergic skin diseases and ectoparasites. During the diagnostic phase it is beneficial to treat for ectoparasites and also begin a food trial.

It is possible to see *Malassezia* (**Figures 1-2**) as a hypersensitivity problem. Treatment often needs to be lifelong treatment with topical or systemic drugs to keep the fungus at low levels on the patient's skin. These patients' pruritus often diminishes greatly with this approach and may need no further treatment. However, atopy may also be a component of the problem. Therefore, if they remain pruritic after cleaning the skin of its *Malassezia* then further allergy work-up will be necessary.

**Figure 1.** Grand Basset Griffon Vendéen with *Malassezia* hypersensitivity.



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At presentation.

**Figure 2.** Pruritus is much reduced when treated with oral itraconazole.



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Same dog four weeks later.

## A) Choosing an appropriate ectoparasitidal treatment

There are each year more and more treatments coming on the market to treat fleas, mites and lice. They may also treat ticks and worms. These are less often implicated in pruritus except for hookworm dermatitis which affects the feet and can often be seen in overcrowded, dirty kennels.

There is not one ectoparasitidal treatment that fits all situations. The first consideration when treating a potential ectoparasite problem is to determine what is the most likely parasite involved. Fleas are a common problem but in flea bite hypersensitivity only 2 or 3 fleas may be necessary to cause a reaction and consequent pruritus. Long-haired dogs may harbour a few fleas and may be very difficult to find, veritable needles in haystacks. If fleas are suspected as a cause of the problem, fipronil based products for the dog and methoprene/permethrin based products for the environment can be used. Spinosid and nitenpyram

can also be used for their quick knock down effect on fleas. An itchy dog should always receive a good quality flea product to ensure that fleas do not become a problem and then add to the pruritus. Atopic dogs can also be flea allergic.

This double-barrelled approach should ameliorate a flea issue quickly. In all cases where ectoparasites are suspected all dogs and cats in the household should be treated. This can often be forgotten! If the pet travels in the car it is important to also spray the car's upholstery.

However, if other ectoparasites are considered more likely such as *Sarcoptes scabiei* or *Demodex canis* then fipronil would not be effective. It can be difficult to find *Sarcoptes* on skin scraping and this can be missed by the clinician. An intensely pruritic dog should always be treated for scabies using selamectin or moxidectin. Selamectin will also treat fleas and the imidacloprid in the moxidectin product will treat fleas but is more likely to be washed-out with frequent washing.

### Pitfalls to consider prior to making a diagnosis

- Don't use steroids in diagnostic phase.
- Don't use steroids and antibiotics together.
- Treat for at least 3 weeks for pyoderma but probably longer.
- Pyoderma and *Malassezia* dermatitis is not recognised.
- You must make a diagnosis if possible.

### Pitfalls in treatments

- Missing sarcoptic mange.
- Inappropriate treatment used for parasite.
- Spot-on not applied correctly.
- Dog shampooed before spot-on has absorbed correctly or shampooed frequently and washing out flea preparation.
- Dog not weighed before ectoparasite treatment applied and then underdosed.

*Demodex* species can be a cause of pruritus but it is usually the secondary pyoderma or an underlying allergy that causes the pruritus. In these cases again corticosteroids are absolutely contraindicated as they will immunosuppress the patient and make replication of the mite easier.

and record in the history that the dog is on a food trial. However, on close questioning during the history it becomes apparent that the dog is getting titbits, chew sticks and dog biscuits as well as the hypoallergenic diet. The clients have not fully understood what the referring vet had asked them to do.

### B ) The difficulties in performing an effective food trial

Dietary hypersensitivity probably accounts for about 5-10% of pruritic patients in referral practices. Dust, pollen and flea bite hypersensitivity are much more common. However, food trials are relatively inexpensive and it is important to rule out a food component from the dog's problem. Pruritic dogs may present with several reasons for their pruritus. For example, the dog may be food allergic and have dust mite allergies. If the clinician only treats the dust mite allergies the dog will not do well.

It is important to spend several minutes really explaining what a food trial is to clients and also send them home with a hand-out re-iterating this information. This is essential. On many occasions, vets refer pets into specialist practices

Other problems can occur if there are children in the house who drop food which the dog eats before it can be removed. Sometimes, members of the family will be less committed than the client who brought the dog in and may continue to feed treats unbeknown to the owner. A food allergic dog will not improve in these circumstances but worse still a diagnosis will be missed condemning the dog to more preventable discomfort.

Bins need to be kept out of reach of dogs on a food trial as they may often scavenge. This may also happen when they are being walked. A lead may be necessary whilst the dog is on a food trial.

There are 3 choices when choosing a suitable food trial:

- An hydrolysate diet,

### Pitfalls during food trialling

- Dog has access to bins or scavenges on the street.
- Other people continue to give treats to the patient.
- Owner does not fully understand requirements and continues to feed other things.
- Diet chosen uses ingredients commonly fed to dog previously.
- Diet causes improvement but challenge is never performed leading to uncertain diagnosis.
- Not doing a second food trial with another product if still suspicious of food.
- Secondary infection and ectoparasites not eliminated during the diet.



- A commercial diet with a novel protein and carbohydrate,
- A home-prepared diet which the dog has not eaten before.

In cases where a food trial has been performed and the dog has not got better but food is still implicated it may be worth doing a second food trial using a different diet in case the dog had an intolerance to the first food trial. Finally it is also important when performing a food trial to make sure that any secondary infection is treated at the same time otherwise the dog may not improve because the infection has not been treated.

As previously mentioned, improving the quality of the diet may lead to an improvement in skin condition and pruritus in a dog that is not food allergic. This is because of the appropriate levels of omega 3 and omega 6 fatty acids and other ingredients that support skin functions (Le Blanc, 2008).

## C) Choosing an antibiotic

There are several antibiotics that have become favourites amongst veterinary dermatologists. These are included with dose rates in **Table 1**.

The bacteria most commonly implicated in canine pyoderma is *Staphylococcus pseudintermedius*. This name change from *Staphylococcus intermedius* is after a re-classification of the *Staphylococcus* group. It is usually resistant to oxytetracycline, penicillin, ampicillin and amoxicillin. These antibiotics should not be used in treating canine pyoderma. An ideal antibiotic should inhibit the specific bacteria in a bactericidal way, although, bacteriostatic antibiotics can be used if the dog is not immunosuppressed. It should have a narrow spectrum so that it does not damage the natural flora of the skin and intestinal tract. Antibiotics may be divided into 3 categories when they are used in veterinary dermatology (from GEDAC - AFVAC):

### Category 1: antibiotics of choice for dermatology:

- **Category 1a:** antibiotics that have maintained more than 90% of their activity against *Staphylococcus pseudintermedius* (SPI) over the years and whose efficacy has been proven in canine dermatology.
- Penicillinase-resistant penicillins: amoxicillin + clavulanic

- acid. Minimal dose rate: 12.5 mg/kg, twice daily.
- 1<sup>st</sup> generation cephalosporins: cephalexin. Minimal dose rate: 15 mg/kg, twice daily.
- Fusidic acid (topical only): twice daily on lesions that cover a relatively small surface area.

- **Category 1b:** antibiotics with an overall activity of 70 to 90% against SPI.
- Clindamycin: dose rate: 11 mg/kg once daily.
- Sulphonamide-trimethoprim: dose rate: 5 mg/kg/d of trimethoprim.

### Category 2: antibiotics for specific indications in dermatology:

- **Category 2a:** antibiotics that can be used for very precise indications after bacterial isolation and antibiotic sensitivity testing.
- Fluoroquinolones: enrofloxacin, marbofloxacin, ibafloxacin, difloxacin. Can be used for superficial or deep pyodermas that do not respond to an appropriate and correctly administered first-line treatment (with antibiotic sensitivity testing), deep pyoderma with risk of bacteraemia, pyoderma due to *Pseudomonas*, otitis media without bone lysis. Dose rate of enrofloxacin, difloxacin: 5 mg/kg/d, marbofloxacin: 2 mg/kg/d, ibafloxacin: 15 mg/kg/d.
- **Category 2b:** cefovecin (3<sup>rd</sup> generation cephalosporin): in the rare cases in which compliance is difficult, but it is essential to schedule repeated injections every 14 days until clinical recovery. Dose rate: 8 mg/kg SC repeated every 14 days. Its activity is not superior to first generation cephalosporins such as cephalexin and it also has an activity against a range of gram negative organisms. Its use could lead to the development of resistance.

### Category 3: antibiotics that are not recommended:

Those with frequent resistances (amoxicillin, ampicillin), poor skin diffusion (tetracyclines), or potential toxicity (gentamicin).

It is very important to weigh a dog suffering from pyoderma so that an accurate dose of antibiotic is given. As discussed previously, this must be given for a minimum of 3 weeks and much longer in the case of a dog with a deep pyoderma. It is common in referral practice to see multiple short courses of antibiotics which never completely clear the infection being administered by the referring vet. Recrudescence is

**Table 1.** List of antibiotics favoured by dermatologists and posology.

Family	Examples	Dose rate
• Macrolides and lincosamides	• Clindamycin • Erythromycin • Lincomycin	• 5-11 mg/kg/day • 15 mg/kg tid • 40-50 mg/kg/day
• Potentiated penicillins	• Clavulanic acid-potentiated amoxicillin	• 12.5-25 mg/kg bid
• Cephalosporins	• Cephalexin • Cefovecin	• 15-30 mg/kg bid • 8 mg/kg every 14 days
• Fluoroquinolones	• Enrofloxacin • Marbofloxacin • Ciprofloxacin	• 5-10 mg/kg sid • 2-5 mg/kg sid • 5-15 mg/kg sid
• Potentiated sulphonamides	• Trimethoprim-sulphadiazine	• 5 mg/kg bid

common. This can happen several times. This on-off use of antibiotics can lead to the development of resistant bacteria such as methicillin resistant *Staphylococcus aureus* (MRSA) or *pseudintermedius* (MRSP).

In cases where the response to a previously suitable antibiotic is poor, culture and sensitivity should be performed to look for the presence of MRSA or MRSP. Treatment should be based on the results of culture and sensitivity.

#### D) Treating *Malassezia* in dogs

Dogs may need systemic treatment or topical treatment. Common topical treatments contain chlorhexidine and miconazole or ketoconazole. Systemically, ketoconazole or itraconazole are the most commonly used drugs. A maintenance dose may be needed to keep the dog's fungal problem under control.

#### E) Treating whilst still diagnosing

During the diagnostic phase, it is good to measure the effect of treatment on pruritus. This will help the clinician secure a diagnosis. If a pet comes in and is very pruritic and a pyoderma is noted, the dog is sent home with four weeks of antibiotics, starting a food trial and receiving ectopara-

sitidal treatment. Four weeks later the dog returns. It may be much better, better to varying degrees, about the same or worse. This can be measured by the state of the skin (has the pyoderma improved, is hair growing back, etc.) and level of pruritus either measured numerically or on a visual analogue scale (see **page 13**). Having "cleaned" the dog of its infection it is possible to see how much of the pruritus is caused by the underlying primary cause (**Figures 3, 4 and 5**).

If the dog is much better with very little pruritus and a good improvement in skin quality there may have been an ectoparasite problem or the clinician may be seeing an improvement because of the food trial. If the original diet is tried again and the dog worsens within one to two weeks then a food allergy is considered likely. Putting the dog back onto its food trial should lead to improvement. The dog may have improved but the pruritus, though reduced, may still be present. This would be suggestive of atopic dermatitis. If no improvement or worse then atopic dermatitis, *Malassezia* or scabies may be present. This process is less likely to happen if multiple vets are involved in the case so continuity is important. This measuring of pruritus cannot happen if anti-inflammatories are given concurrently.

If there has been no or little improvement the clinician should review his diagnosis and if all other diseases have

**Figure 3.** Pyoderma on leg before treatment.



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**Figure 4.** Pyoderma after treatment - pruritus resolved underlying problem demodicosis (same dog as in Figure 3).



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been ruled out then this is the time to perform intradermal skin tests and allergy blood tests. Once a diagnosis has been made treatment to alleviate the pruritus can be instigated.

## F) Use of topical therapy in veterinary dermatology

Topical therapy will often reduce pruritus and have a steroid sparing effect too. However, it is important to realise that one shampoo does not fit all situations. Whichever company's products are used it is important to be aware of the different types of shampoos:

1. Shampoos for keratinisation disorders,
2. Shampoos for microbial infections,
3. Shampoos that help decrease pruritus by normalising the constituents of the stratum corneum.

Often when a dog is referred an inappropriate shampoo may be being used. The use of inappropriate shampoos by the clinician may cause, in the long run, the dog's coat to dry out and worsen the situation. It is also essential to test-wash a dog when a shampoo is being used for the first time. A small area is shampooed and left on for a minute and then rinsed off. If there is no problem subsequent washes can be on all affected areas with a contact time for the product of ten minutes. Often pruritic dogs may lick and bite their feet. If the dog is placed in a bath with water in it then the feet will never have the product on for ten minutes. It is always

best to shower the dog and treat the feet when there is no water in the bath. An appropriately chosen shampoo is likely, in combination with a systemic antibiotic, to quicken clinical cure.

In widespread, generalised pyoderma it is often appropriate to clip dogs, especially long-haired ones, to allow better penetration of the topical therapy into the skin and also because crusts and matted fur are removed. The hair will usually grow back reasonably rapidly and the skin will also improve quicker.

## G) Other topicals

Tacrolimus belongs to the same family as cyclosporine but can be applied topically. It can be very useful on small focal pruritic areas such as feet, face or anus. It is an unlicensed product and requires informed consent from the client.

A hydrocortisone aceponate spray is increasingly recognised as a useful adjunctive treatment for atopy particularly in dogs who cannot tolerate oral steroids for any reason, *e.g.* concurrent NSAID use, liver problems, aggression, etc. It can be used for short periods on atopic dogs to treat focal lesions. It may also allow intradermal skin testing to continue despite its concurrent use as long as it is not applied to the site where the test will be performed. In one study it was shown to have an equal efficacy compared with cyclosporine. If lesions are widespread then systemic medication is

**Figure 5.** Complete resolution of dermatitis in dog with pyoderma due to demodicosis (same dog as in **Figures 3 and 4**).



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always necessary. However, all of these techniques are worth considering by the clinician because they may allow a reduction in systemic anti-inflammatory use.

## 2/ Treating the pruritic dog post-diagnosis

Once a diagnosis is made, more specific treatment can be given. If a dog is discovered to be allergic to beef then not feeding beef containing pet food will, of course, lead to clinical improvement. It can be difficult to know what is in commercial pet food so more specialised diets may be necessary. The dog may also have multiple allergies including dust mites allergies.

The most common diagnosis is atopic dermatitis, made by excluding all other diagnoses. Most commonly atopic dermatitis is due to one or a mixture of the dust mites. The gold standard treatment is the use of allergen specific immunotherapy tailored to the particular dog. Clinicians often ask the question whether a standard vaccine including a mixture of dust mites can be used without using blood tests or intradermal skin tests. Studies on this have always shown allergen specific vaccines to be much more effective.

Allergen Specific Immunotherapy (ASIT) will not work initially and usually takes at least 4 months to become effective and may take longer. It is, therefore, important to be strict in following the vaccine interval protocol and also using other medications such as corticosteroid or cyclosporine in the early phases to keep the pruritus at a manageable level for the dog and client.

Reducing dust burdens in the house is also worth considering. Regular hoovering and use of miticidal sprays will help as will the use of regularly washed cotton sheets for the dog to lie on. *Tyrophagus putrescentiae* and *Acarus siro* are storage mites found in dry food. Storing dry dog food in an airtight container will slow down the multiplication of the mite.

## A) Use of anti-inflammatories in the pruritic dog

### 1) Steroids

Corticosteroids have a bad name in veterinary dermatology. However, if used correctly they can have a beneficial effect on dogs suffering from atopy whilst at the same time having minimal side-effects. It is very important to not use them until a diagnosis has been made and to aim for every other day dosing to decrease the chance of side-effects. Often corticosteroid is used without a proper diagnosis for long periods with decreasing effectiveness. Dogs on corticosteroid should be seen regularly by the vet to make sure that there is no recurrence of pyoderma or side-effects from the steroids. Using other drugs alongside the corticosteroid will allow lower doses to be used. Steroids have a fast action and will often give quick relief from pruritus. They are also relatively cheap.

### 2) Cyclosporine

Cyclosporine is a useful drug to have available in veterinary dermatology. However, it is more expensive product than corticosteroids and has some side-effects of its own. It often takes longer to have an effect than corticosteroids. The patient is usually placed on a month's supply of daily cyclosporine at 5 mg/kg sid and the dose is reduced to two to three times a week if efficacious. Two to three months at daily dosing may sometimes be necessary with recalcitrant cases. Cyclosporine is much more expensive than corticosteroids but may be a better product than steroids when there are side-effects or long-term use is necessary (**Table 2**).

**Figure 6.** The nurse is key for explaining how to apply ear medication, flea control, elimination diet, as well as for the telephone follow-up.



There are other treatments which can be used for pruritus. These include essential fatty acids, anti-histamines, Chinese herbal remedies and other products which are appearing on the market regularly.

**Table 2.** Corticosteroids versus cyclosporine.

Corticosteroids	Cyclosporine
Cheap	Expensive
Short-term use	Long-term use
Faster acting	Slower acting
Find minimal efficient dosage	May only need twice weekly dosing once atopy has settled
Side-effects likelier with long-term use	Side-effects less likely

In summary, a systematic approach to treatment using several therapies will usually lead to better results than an over reliance on one product. Regular feedback and communication with the client is important to ensure compliance and a good outcome for the pet.



## The importance of owner communication

### Give written information to the owner

It is vitally important to continue communicating with the client past the initial consult. At the initial consult it is always important to write down what you want the client to do until the next visit including clear instructions on food and flea trials and instructions on the usage of any medications prescribed. Clients will not always hear everything that is said to them. Written instructions can be looked at later if they are not sure of anything. It is also good to go over the list of instructions several times so the clinician is sure that everything has been understood. This is particularly important with food trials when the client will often still not understand how rigorous the trial must be. The written instructions provided to the client should also have email and telephone contact details. This makes it easier to stay in touch. The client's telephone and email details should be recorded in the history to make it easier to stay in contact. It is good to discuss what are the possible outcomes of treatment; any potential side-effects of drugs dispensed and what is likely to happen at the next visit.

### Schedule follow-up appointments

Review appointments are very important to check how the dog is doing. As previously mentioned, ascertaining the pruritic level is a very good way of helping establish the diagnosis. Gentle direction of the client might be necessary to get an understanding of what level of improvement, if any, there has been since the last appointment. Follow-up appointments also allow the clinician to check-up on the level of compliance: have all the antibiotics been used or have they been dosing them incorrectly? Has the food trial been adhered to or have "accidents" occurred? It is also important to see if the level of pruritus has diminished at all. There are various techniques to do this but one is the visual analogue scale. The client is shown a line and asked to note where on the line the dog's pruritus is. If this is done at each visit a subjective idea of deterioration or improvement is seen. A numerical scale of 1-10 can also be used (see **page 13**).

### Allocate a nurse to the follow-up of each pet (**Figure 6**)

If interest is shown by the clinical team then the client will also stay motivated. A nurse can keep in contact between appointments to see how the patient is progressing. The clients really appreciate this and it builds up trust and makes them more likely to contact the practice if there is any problems. As test results come in there may be a change in emphasis of treatment.

### Managing the motivation of an atopic dog's owner is a real skill

Atopic dogs can be difficult to keep comfortable. They are prone to having flare-ups. If there is a good relationship between vet and owner then it is more likely that they will contact the vet who can then begin appropriate treatment. This could be to increase their anti-inflammatory drug dose because pollens have increased or to treat with systemic antibiotics because pyoderma has recurred. If the pet is on allergen specific immunotherapy it is important to make sure that the pet has its injections at the correct intervals. A nurse can take these appointments and by careful listening to the client can see if there are any problems which the vet has to know about. Training the nurse to ask relevant questions is important. In long-term atopic cases, the dog should be seen every three to six months and earlier if there is a problem. Continuity of care will also improve compliance and results.

With successful communication between the client and the veterinary team a more successful outcome and a happier dog is more likely.

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# Personal notes



*This book has been prepared with the greatest care, taking into account the latest research and scientific discoveries. It is recommended that you refer to drug and food prescriptions and instructions, since they are likely to change. In view of the diversity and complexity of clinical cases for dogs, it is imperative to realise that any supplementary tests and therapeutic treatment described in this book are non-exhaustive. The treatments and solutions proposed can under no circumstances replace examination by a qualified veterinarian. The publisher and authors can in no way be held responsible for any failure of the suggested treatments and solutions.*

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