Virbac & Veterinarian Team Education Courses present

A Complete Approach to Treating the Chronic Allergy Patient

A one day interactive integrated CE program for veterinarians and the veterinary team on systemic approaches to treating the chronic allergy patient sponsored by Virbac

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DVM Note Section

Dermatology Diagnostics

1. Skin Scrape/Cytology: Good combination test
    a. Any primary lesion is good candidate
    b. Various collection methods
        i. Blade
        ii. Tape
        iii. Swab
        iv. Needle
    c. Look for microorganisms, mites, neoplastic cells, acantholytic cells, ectothrix hyphae,
    d. Scraping technique influenced by which mite is suspected. Scrape superficial and wide for Sarcoptes and Cheyletiella
2. Dermatophyte testing
    a. DTM with tooth brush
    b. Woods lamp and trichogram less reliable
    c. Always speciate
3. Skin Biopsy
    a. Most possible with local anesthesia only
    b. Do not prep lesions, leave crust on the skin
    c. Dermatopathologist is critical
4. Allergy testing
    a. Serology testing
        i. Readily available, less reliable
        ii. Offered by many laboratories, need to insure results are accurate
        iii. Results are delayed, and less flexibility with allergen selection for testing
        iv. Less suppression by drug therapy
    b. Intradermal allergy testing
        i. Requires practice, and usually referral
        ii. Fewer false positives
        iii. Suppressed by steroid and antihistamines
        iv. Patient sedation, and clipping, but results available same day
    c. Any type of allergy testing should not be considered until owner committed to allergy specific immunotherapy (ASIT) and veterinarian is knowledgeable of local and significant allergens and is willing to closely monitor patient response to ASIT and manipulate or adjust the protocols based on the patient's response.

Food Hypersensitivity

1. Several types of adverse reactions to foods
    a. Immediate or delayed reaction
    b. Offending allergen is usually > 12,000 Daltons, and is usually a protein
    c. Many proteins have been identified as potential allergen
    d. Cross reactions between different proteins also occurs
2. Food allergy more common in "allergic breeds"
    a. Any age, sex or breed possible
    b. Non seasonal pruritus, dermatitis, recurring pyoderma, otitis
        i. "ears and rears"
    c. 1/3 may have concurrent GI signs
        i. Vomiting, diarrhea, flatulence etc.
    d. In cats, can manifest as eosinophilic granuloma complex
3. Diagnostic tests: Elimination diets are the **only** accurate and dependable test for identifying food allergy in dogs or cats.
    a. Serology and intradermal testing give false positive and false negative results.
    b. Novel protein and hydrolyzed diets are the test diets of choice
        i. Beware previous exposure, treats, cross reactions between similar proteins
        ii. Beware additional medications (chewable, gelatin)
        iii. Client hand outs, and education of owners by our technicians invaluable
        iv. Control of concurrent allergy and infections are mandatory in order to determine progress or success with a food trial

Diagnosis and Treatment of the Pruritic Dog

1. Causes of Pruritus
    a. Parasites:
        i. Flea: Dx based on clinical exam, finding fleas. Treatments well discussed elsewhere, but resistance is NOT occurring. Misconception of flea resistance based on misunderstanding of flea life cycle, and misapplication of products.
        ii. Scabies: Intense pruritus may be acute. Physical lesions suggestive of scabies (crust on ear margin, elbow). Appropriate to treat even if suspect scabies. Clipping hair increases chances of finding mites. Ivermectin and Selemectin are my preferred products.
        iii. Cheyletiella: Not as intense as scabies, but may also be difficult to recover on scraping. Prefers dorsal trunk, with more scale. Treatment same as for Scabies. Treatment of environment also helpful, as Cheyletiella can live off the dog for 1-2 weeks.

iv. Demodex: Not always pruritic, but can be. Requires deeper scraping. Multiple treatment options, I prefer rotenone for localized patients, and ivermectin or Milbemycin for generalized patients. Benzoyl peroxide baths also helpful. Treatment of secondary infections often times reduces most of the pruritus.

b. Infection
    i. Staphylococcus pseudointermedius most common infection in our practice. Considered secondary to other underlying disorder. Can cause significant degree of pruritus. Diagnosis based on clinical signs and cytology. Treatment includes systemic antibiotics for 3-8 weeks depending on depth of infection. Resistance becoming a significant problem. Intensive topical therapy with antibacterial baths and rinses may decrease amount of systemic therapy necessary, and minimize recurrence. It is imperative to search for and deal with the underlying cause(s) when infections are recurrent. Allergy and endocrineopathy account for the majority of recurrent infections.
    ii. Malassezia pachydermatitis also commonly seen. Also considered to be secondary, usually to underlying allergy. May cause further hypersensitivity. Diagnosis based on cytology. Treatment with topical shampoos and rinses or medicated wipes. Systemic antifungal drugs (all of the azoles) are also helpful.
    iii. Dermatophytosis: Can potentially cause a significant amount of pruritus and is especially misdiagnosed in dogs. Best therapy is antifungal topically and systemically. Treatment more difficult in cattery or multi-pet homes. Useful website is www.giveshelter.org/sitemgr/ringworm
c. Allergy: Big three are environmental (atopy), food, and parasite
d. Less commonly: Sebaceous adenitis, T-cell lymphoma, pemphigus foliaceus

<u>Diagnosis and Treatment of Atopy</u>

2. Atopy: An inherited type 1 hypersensitivity reaction to percutaneously absorbed antigens.
    a. Known breed predispositions, but any breed or mixed breed is susceptible.
    b. 1-3 years of age most common age of onset. Clinical signs are pruritus, otitis, and recurring pyoderma or Malassezia dermatitis.
        i. Diagnosis based on history, physical exam, and the elimination of other causes of pruritus. Diagnosis is NOT based on allergy results. Pruritus of medial elbow highly consistent with atopy
        ii. Many atopic patients will have concurrent food or parasite hypersensitivity!
3. Treatment options for atopy
    a. Supportive care: Should be first line of therapy, but not sufficient in moderate or extreme cases. Supportive care will enhance other, more potent, therapies.
        i. Antihistamines: Many available. No one “best” antihistamine. I usually have owners try several to determine which might be best for each individual patient.
        ii. Fatty acid supplementation: Some diets excellent source of omega 3 oils. Many supplements also available.

iii. Frequent baths and rinses: Removes exogenous allergens, re-establish or enhance epidermal barrier, kill bacteria/yeast. Products with chlorhexidene and epidermal lipids far superior than oatmeal.

b. Corticosteroids: Potent, inexpensive, fast acting.
   i. Great in a crisis, and for patients with short, seasonal pruritus.
   ii. Long-term use can result in many side effects well known to veterinarians and many owners.
   iii. Methyl prednisolone oral has less PU/PD and behavioral side effects
      1. 4 mg Methyl prednisolone = 5 mg prednisone
   iv. Do not use prednisone in cats. Prednisolone or methyl prednisolone best.
c. Cyclosporin: More frequent use over the last decade. 5 mg/kg daily starting dose.
   i. Alters T cell function and IL-2 production
   ii. Formulation will affect absorption. Microemulsion or "modified" products more efficacious, but more expensive.
   iii. Not all patients respond, and some not able to be controlled with lower dosage
      1. Administer daily for 30 days before attempting to lower dosage
      2. One study determined no difference between lowering daily dosage vs. giving higher dose less often.
   iv. Significant drug interactions to consider and be aware of, especially with antifungal azoles, fluoroquinolones, phenobarbitol.
   v. Side effects include GI upset, gingival hyperplasia, opportunistic infections.
   vi. Contraindicated in liver or kidney disease, hypertension, neoplasia, or concurrent systemic infections.
d. Allergy specific immunotherapy (ASIT) or "desensitization"
   i. Proper diagnosis is mandatory. Control of concurrent allergy (food, flea) also necessary. Continual monitoring for secondary infections which exacerbate pruritus also necessary.
   ii. Requires an awareness of local allergens. Allergens with long seasons, and or high production levels should receive higher priority when mixing allergen vial.
   iii. Known "triggers" of pruritus (lying on the grass) should be considered.
   iv. Contents of allergen MUST correlate with patients history (seasonal vs. non) and likelihood of exposure.
   v. Proteolytic enzymes from molds, Staph, +/- dust mites may breakdown pollens when mixed in same vial.
   vi. In humans, higher levels of protein injected result in more favorable response. Many ASIT protocols utilize 2 or 3 diluted vial systems. In authors opinion this results in unnecessary delay (and patient suffering) before effective levels of allergen are administered. This may result in discontinuation of protocol by inpatient owners.
   vii. Many patients do "best" with 10,000-30,000 PNU given every 1-4 weeks, but this is highly variable, and should be based on patient's response.

viii. Adverse reactions NOT an indication to discontinue ASIT, but a signal that further manipulation is necessary. Usually smaller volumes, +/- pretreatment with antihistamine and or corticosteroid prior to allergen injection.

ix. Long-term benefits of ASIT are numerous. Many patients can be controlled more cost effectively and safely than with any other option. Most patients will not develop additional allergies while on ASIT. However, for maximum benefit, a veterinarian and owner need to take an active role in the implementation of this therapy. If not referred, then serology testing is likely utilized. Reliance on generic advice from the company regarding formulation of extracts and ASIT schedules may not result in the most optimum results possible.

4. To summarize, there is not one "best" option for the management of an atopic patient. Factors such as the severity, age and seasonality of the patient, financial constraints and expectations of the owner, and abilities and interest of the veterinarian and staff all play a role in determining the optimal treatment protocol. Many allergic patients, especially those with more moderate or severe allergies require multiple options to remain comfortable. The trend of reliance on some of the newer "big gun" treatment options for ALL atopic dogs concerns this author. To justify this concern, I would simply ask what treatment you would seek for yourself or your child. I would expect cyclosporine and corticosteroids would not be the first drug off the shelf. I encourage all veterinarians who treat allergic patients in their practice to become more knowledgeable with some of the other therapy options discussed today.

Dermatology Nuggets

Pattern of Distribution helpful for differential

a. Food allergies affect "Ears & Rears"
b. Atopy affects medial elbow
c. Fleas: Dorsal caudal trunk

5. Dermatology Mimickers
    a. Inflammatory alopecia with endocrine disorders
        i. Sebaceous adenitis and allergy may cause symmetrical alopecia
6. Pustule deceptions
    a. All pustules are not pyoderma
    b. Pemphigus foliaceus often misdiagnosed as pyoderma
        i. Cytology helpful to distinguish
            1. Culture if bacteria present
            2. Biopsy if bacteria absent
    c. Dermatophytosis can mimic pemphigus and pyoderma

7. Age of onset
    a. Atopy any age. 1-3 years most common, can range from 12 weeks to 12 years
    b. Food allergy at any age, especially in older dogs. German Shepherds and Shar Pei predisposed
8. Allergy misconceptions
    a. New hypersensitivity must be something new in environment or diet
    b. Instead, most new allergy caused by a allergen with chronic exposure
9. How to "convince" an owner to perform a food trial?
    a. "They are going to feed them anyway"
    b. Acute, intense pruritus in middle age dogs, Be CERTAIN to rule out
    c. Scabies
    d. Dermatophytosis
    e. Pemphigus
    f. Drug eruption
    g. In older dogs, also rule out T-cell lymphoma
10. Stop Saying
    a. You are over-bathing your dog
    b. It doesn't matter what he is allergic to, we can't do anything about it anyway
    c. Allergy testing is to expensive…and then prescribe cyclosporine

Otitis Diagnosis and Treatment

1. Otitis externa is a clinical sign, not a diagnosis!
2. Successful outcome requires
    a. Identification of underlying cause
        i. Allergy most common
        ii. Foreign body
        iii. Parasites
        iv. Endocrine, autoimmune, keratinization disorders less common causes
    b. Adequate treatment of secondary factors
        i. Bacteria and yeast are NOT the cause of otitis, but a secondary and perpetuating factor
    c. Predisposing factors
        i. Narrow ear canals
        ii. Pendulous pinnae
        iii. Recurring trauma (Q-tips)
        iv. Water (maceration)

3. Examination of the ear canal
    a. Pain, exudate, and stenosis can all make otoscopy more difficult
        i. Anesthesia or sedation allows better visualization and cleaning

ii. Pretreat with 7-10 days of corticosteroids to reduce swelling/stenosis

b. Cytology of exudate essential
    i. Coccoid bacteria: Treat as “normal” for Staph systemically. Most otic antibiotic and cleaners appropriate
    ii. Rod shaped bacteria: Culture, topical neomycin or gentamycin. Reserve tobramyacin and fluoroquinolones for resistant strains or for when tympanum ruptured (or unknown). Pre-treat with topical Tris-EDTA prior to antibacterial product topically. Culture if rods present, or not responding as expected to appropriate therapy.
    iii. Malassezia: Topical clotrimazole, miconazole, or ketoconazole and azoles systemically

4. Always treat systemically if tympanum ruptured, or if otitis media present or suspected
5. Otitis media requires longer therapy, Four weeks is minimum, may require 1-3 months
6. Ear Cleaning
    a. Ceruminolytics- use with caution when tympanum ruptured
        i. DSS and detergents are the strongest
        ii. Propylene glycol and Squalene are milder
    b. Flush with warm saline until clean
        i. Grasping forceps and curettes helpful
        ii. Once clean, suction until dry, then instill antibiotic and or Dexamethasone
7. At home cleaning
    a. Selection of cleaning solutions based partly on cytology results
    b. Author will occasionally have owners alternate an acidic ear wash with an alkaline product to prevent bacteria from adapting to one pH

Approach to Pruritus

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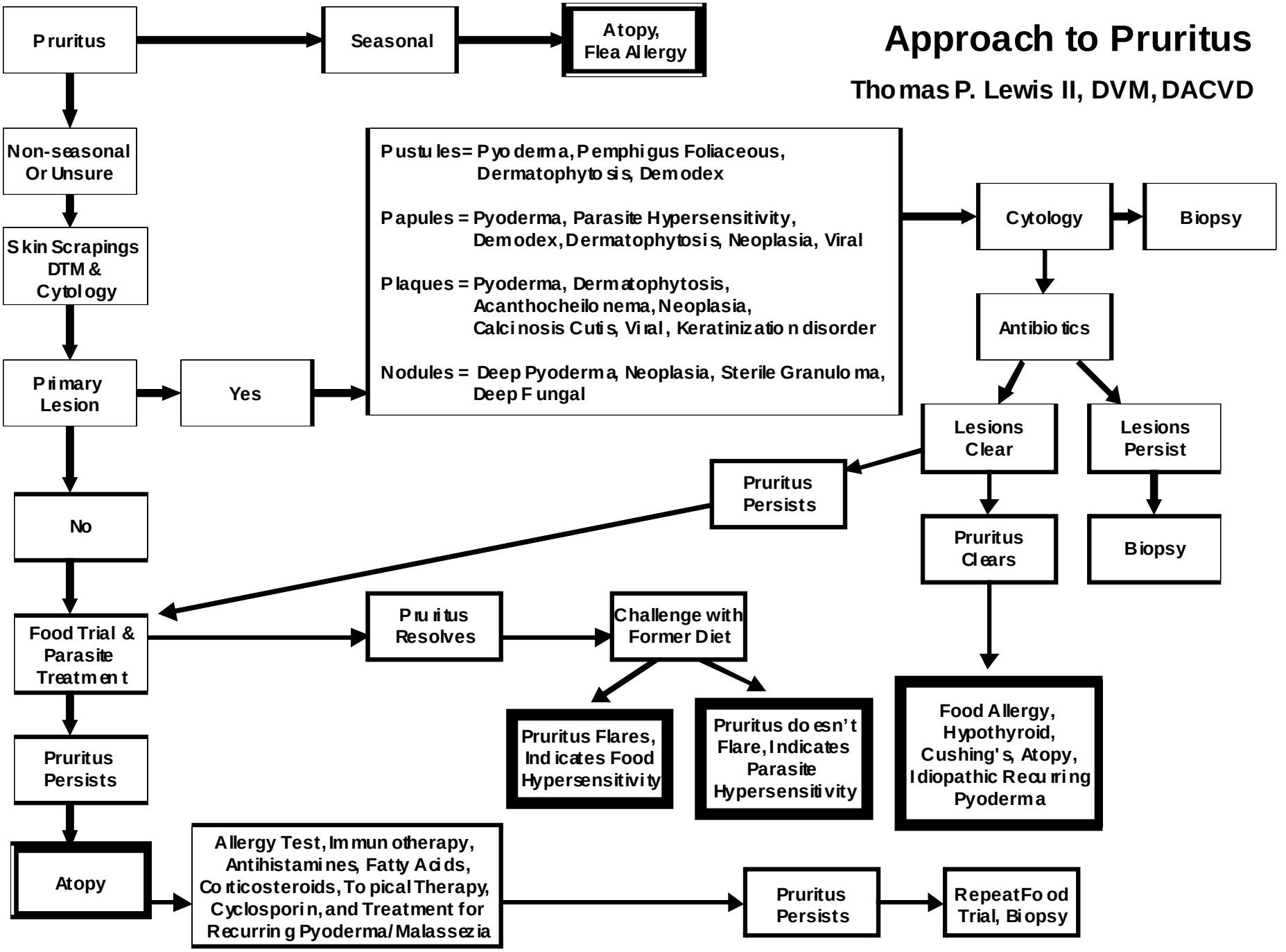


Team Notes

Integumentary System:

Skin can be affected by many primary diseases that can produce secondary changes in the skin. The medical team must differentiate primary skin problems from secondary changes caused by other disease entities. Some examples of diseases that can produce secondary skin changes are:

- **Nutritional Disease / Deficiency**
- **Chronic Infectious Disease**
- **Intestinal Parasitism**
- **Kidney Disease**
- **Liver Disease**
- **Hormonal Disease**
- **Cancer**

Further the medical team must be aware of skin diseases that pose a threat to other animals and people (Zoonotic Disease). Examples of these types of disease are:

- **Ringworm** – Medical team must differentiate the symptomatic patient from the carrier state.
- **Sarcoptic Mange**

Any patient with hair loss, flaking of the skin, or itchy (**pruritic**) skin should also be treated as a zoonotic potential suspect.

Obtaining a history in patients with skin disease: These questionnaires help to start the diagnostic process. In obtaining a medical history, some helpful questions are:

- **When did the first signs occur?**
- **What other treatment has the pet been on?**
- **Does your pet have a reoccurrence of skin problems seasonally?**
- **Where does the pet stay mainly - inside or outside pet?**
- **Does your pet have problems with fleas and ticks?**
- **Have there been any changes in topical medications used on your pet?**
- **What diet has your pet been on and how long**?
- **Is your pet on any dietary supplements**?.
- **Has your pet shown any signs of systemic disease (C/S/V/D/ PU/PD)?**

- **Has there been a history of weight change or chronic obesity?**
- **Are there any other animals in the household and if so how are they doing?**

Physical changes in the hair coat noticeable on initial assessment: When performing an initial assessment, the entire hair coat of the animal should be evaluated for change. It is important to assess where the changes in the hair coat are occurring most often. Common symptoms can be:

- **Erythema**
- **Pruritis**
- **Alopecia**
- **Pustules**
- **Excoriation**
- **Hyperpigmentation**
- **Seborrhea:** There are two types of seborrhea:
    - Dry (**seborrhea sicca**)
    - Oily (**seborrhea oleosa**)

Diagnostics for skin problems: An overview of the in-hospital clinical diagnostics includes:

- **Skin Scrapings:** A skin scraping should be performed on all pruritic animals. Animals presenting with weeping or moist lesions, crusts, excoriation, erythyematous or alopecic areas, papules or pustules should also have skin scraping performed. A properly performed skin scraping may aid in the diagnosis of Demodectic and Sarcoptic mange, and less commonly, identify cheyletiella mites.

- **Fungal Diagnostics:**

    - **Black light:** Some species of infectious fungal pathogens (dermatophytes) will light up or fluoresce in the presence of a black light.

    - **Fungal Culture:** A fungal culture is used to isolate and define the infectious fungal pathogen. Once the sample is collected and plated, it can take **up to 4 weeks** to adequately grow the dermatophyte for identification.

- **Skin Cytology:** With concerns of bacterial and fungal skin infection, skin cytology can be an extremely helpful tool in identifying causative agents producing signs of pruritus,

alopecia, erythema, scaling, and rash. There are many excellent ways to evaluate skin cytology dependent upon the type of lesion evident. Types of cytology include:

- **Scotch Tape Prep**: The scotch tape prep is helpful in identifying fungal and bacterial components in moist red and raw regions of skin where active infection is occurring.
- **Direct Smear:** Direct smears are used when lesions are producing a liquid discharge which can be clear, purulent (pus) or bloody in nature.
- **Impression Smear:** Impression smears are obtained when there is a lesion that is moist or producing a clear, purulent, or hemorrhagic discharge. These lesions are open and draining such that infectious agents and cells may be apparent at the surface of the skin.
- **Swab Method: the Q-Tip or Swab Method** is used to obtain crusts and debris from regions where a direct or impression smear are not possible (i.e. ear canal, interdigital region, skin fold…).
- **Fine Needle Aspirate:** is performed to obtain cell and fluid aspirates of masses and lesions that are involved within or below the skin. The fine needle aspirate samples a few hundred cells out of millions, and although it can be very helpful in suggesting the cause of the mass or lesion, a **negative fine needle aspirate cannot rule out malignancy.**

- **Advanced Diagnostic Procedures**:

  - **Skin Biopsy:** Taking a small skin biopsy of the full thickness of the skin with a specialized blade can allow veterinarians to more specifically identify what type of diseases may be affecting the pet's skin. The procedure is done with light to no sedation and a small local block at the biopsy site. These biopsies are placed in formalin and generally sent into the reference lab for histopathology.

  - **Skin Allergy Testing**: Very similar to human medicine, the animal is tested for specific allergens to inhalant allergies. Once the types of irritants are known, a vaccine can be made to try to help desensitize your pet to the specific allergens.

  - **Blood Allergy Testing**: It is also possible to draw samples of blood to help detect what allergens the patient is sensitive to. From the results of blood allergy testing, desensitization vaccines can be produced. Blood allergy testing can be less specific than skin testing, producing less reliable results.

  - **Complete Blood Count and Chemistry Panels**: Blood work can help detect if there are changes in the blood suggestive of chronic infectious, organ (i.e. liver or kidney), inflammatory or hormonal diseases that can cause of the skin problems. Further, thyroid blood work can evaluate if the patient has a thyroid abnormality.

Diseases of the Integumentary System

- **Allergies:** Allergies are one of the most frustrating non-life threatening illnesses the patient and client may have to face. Allergies are an allergic response to components of diet, inhalant allergens, fleas and topical irritants. Successful treatments vary from patient to patient, and can involve dietary trials, medications and desensitization vaccinations.

    - There are four basic components of allergies.

        - **Atopy**
        - **Food Allergy**
        - **Flea Allergy**
        - **Contact Allergy**

    - **Common Points in Medical History:**

        - Reoccurring pruritus, erythema, and hair loss that occurs seasonally (i.e. fall & spring) or year round.
        - Chronic ear infections
        - Chewing and licking between the toes
        - Pustules or Rashes
        - Excessive Shedding

    - **Common Observations in Initial Assessment:** All skin disease can have very similar signs. Common symptoms may be:

        - Itching / Scratching (Often Severe)
        - Redness of the skin
        - Licking of the paws
        - Chewing between the toes
        - Red-hot inflamed draining areas in the skin (Hot spots)
        - Discharge of the eyes and nose (Occasionally)
        - Pustules or Rashes
        - Areas of Hair Loss
        - Dry Flaky Skin

    - **Diagnosis**: See above

    - **Treatment: There is no absolute cure for Allergies.** Medical options in approaching pets with seasonal and year round itching are:

- Antihistamines
- Essential Fatty Acids (EFA)
- Steroids
- Cyclosporine.
- Food Trial
- Allergy Testing / Desensitization Vaccines

- **Demodecosis (Demodectic Mange): Demodecosis is a parasitic mite infection of the hair follicle.**

  - **Common Points on Medical History:** Generally Demodectic Mange produces a mildly to moderate pruritic localized to generalized infection in young pets.

  - **Common Observations in Initial Assessment:** Common physical symptoms are:

    - Areas of hair loss (Localized to general)
    - Redness of the skin
    - Itchiness
    - Areas of the skin begin to ooze pus and debris (secondary bacterial infection)
    - Scaling and dry flaky skin

  - **Diagnosis:**

    - **Juvenile:** Skin scrape
    - **Adult:**

      - Skin Scrape
      - Complete Blood Count
      - Chemistry
      - Thyroid panel
      - Infectious Disease Screenings

  - **Treatment:** Demodectic mange can be treated with topical salves, whole body dips or oral medications to help eliminate the active infection.

- **Sarcoptic Mange (Scabies) Sarcoptic** Mange is a parasitic infection of a skin mite of the epidermal skin layers. **It is a zoonotic disease and sarcoptic mange has a high incidence of infection to other animals or humans through direct contact; care must be taken when handling affected pets.**

- **Common Points on Medical History:** Sarcoptic Mange produces severely pruritic pet with regions of alopecia, rashes and scaling.

- **Common observations in Initial Assessment:** Common physical symptoms are:

  - Areas of hair loss (Localized to general)
  - Redness of the skin (Severe)
  - Itchiness
  - Areas of the skin begin to ooze pus and debris (secondary bacterial infection)
  - Scaling and dry flaky skin
  - **Generalized enlargement of all external lymph nodes**

- **Complications:** If not diagnosed and treated, Sarcoptic mange can produce severe hair loss and skin damage that can be infectious to other animals and humans.

- **Diagnosis:**

  - **Skin scrape (possibly)**
  - **Fecal Exam**
  - **Response to Treatemnt**

- **Treatment**: Treatment generally involves oral, topical or injectable medication to eliminate the infection, oral antibiotics to help decrease secondary bacterial infection, and oral and topical medication to decrease pruritus. **Further all dogs that have contact with the patient should also be treated.**

- **Dermatomycosis (Ring Worm):** Ringworm is a cutaneous fungal infection affecting the regions of the hair, nails and the superficial layers of the skin. **Ringworm has a high incidence of infection to other animals or humans through direct contact; care must be taken when handling affected pets.**

  - **Common points on Medical History:** Affected animals present with small to mild to moderate size regions of hair loss, dry flaky skin with moderate levels of pruritus.

  - **Common observations on Initial Assessment: Some pets may have no physical symptoms of disease; cats are often be carriers of the disease without any physical signs**. The fungus can exist below the hair line and it can still be infectious. However, classic symptoms can be:

- Circular regions of hair loss
- Poor hair coat
- Scales
- Erythema
- Areas of hyperpigmentation
- Pruritus

- **Diagnosis:** Diagnosis is based on medical history, physical examination and the following clinical diagnostic:

  - **Black Light Evaluation – Maybe**
  - **Dermatophyte Culture**

Endocrine Diseases of the Skin

- **The Thyroid Gland**:

  - **General**: The thyroid glands are a set of paired dark red glands on either side of the trachea, sitting lateral and ventral to the trachea. There can be tremendous variation between location and numbers of variation of glands depending on the animal. The more proximal edge of the thyroid begins close to the distal laryngeal region and ends at the 5th tracheal ring. **The thyroid gland is responsible for the production of** thyroxin **hormone that sets the** Basal Metabolic Rate (BMR). **The BMR regulates the level that cells burn energy and turnover. The hormone is released with ebb and flow patterns throughout the day to produce a sustained effect.**

    - Decreased production (Hypothyroid)
    - Increased production (Hyperthyroid)

    The diseases that produce hypothyroidism are broken into the following categories:

    - Idiopathic Thyroid Gland Atrophy
    - Immune Mediated Disease
    - Pituitary Neoplasia

    In Hyperthyroid animals, a thyroid tumor of the gland itself produces an over production of thyroid hormone.

- **Obtaining a history for animals affected by Thyroid Disease**: Some questions to focus on when thyroid disease is suspected are:

    - **What is the age of the patient**?
    - **What is the breed of the pet**?

        - **With Hypothyroidism**:

            - Airedale
            - Boxer
            - Cocker Spaniel
            - Dachshund
            - Doberman Pinscher
            - Golden Retriever
            - Great Dane
            - Irish Setter
            - Miniature Schnauzer
            - Old English Sheepdog
            - Pomeranian
            - Poodle
            - Shetland Sheepdog

        - **With Hyperthyroidism**: No breed predilection, however the disease is mostly observed in cats.

    - **How is the pet's energy level**?
    - **Is there an overall problem with weight? Lean vs. Obese**
    - **Has the animal been shedding excessively**?
    - **Is the animal a chronic vomiter or regurgitator**?
    - **Does your pet have a tragic expression**?
    - **Does the pet have a history of chronic ear infections**?
    - **Does the animal have a history of reproduction problems?**

- **Common Observations on Initial Evaluation:**

    - **Changes in the pet's general appearance:** Most animals with thyroid disease have poor hair coats with a lack luster appearance that appears unkempt. More specifically

        - **Hyperthyroid animals**: have very thin coats, which tend to be oily to dry. These pets can be chronic shedders.

- **Hypothyroid animals** also show severe shedding with potentially poor hair coat with a symmetrical hair loss over the sides of the abdomen (**Symmetrical Flank Alopecia**). There can be increased pigmentation of the skin, dry or oily skin, and thickening areas of skin. The animal may seem to have low energy, a tragic facial expression, and are more prone to skin and allergy problems.

- **Ears:** Low thyroid patients can have chronic ear infections with red inflamed ears.

- **Heart rate:**

  - **Bradycardia (heart rates < 80 beats / minute)** - hypothyroid patients (rarely).

  - **Tachycardia (heart rates > 200 beats / minute)** - hyperthyroid cats.

- **Thyroid gland enlargement:** Most hyperthyroid animals have palpable thyroid glands on one or both sides.

- **Neuromuscular Changes: Facial nerve paralysis (RARE)**

- **Keratoconjunctivitis Sicca (KCS)**

- **Clinical Diagnostic Testing for Evaluating Thyroid Function:** Some possible clinical diagnostics are:

  - **Lipemic Serum**
  - **Chemistry:**

    - With a **hyperthyroid patient**:

      - Increased Alanine Transferase (ALT) and other liver enzymes
      - Elevations in Alkaline Phosphatase, BUN, Glucose, Phosphorus and Bilirubin (rarely)
      - **Increased Blood Pressure**

    - With the **Hypothyroid patient -** Increased blood cholesterol levels

  - **Evaluating Thyroid Level:**

- **Total T_4 –** True Hypothyroidism vs. Euthyroid Sick.
- **Free T_4 done by Equilibrium Dialysis**
- **T_3 Level**
- **T_3 / T_4 / Thyroglobulin Autoantibodies**

- **Diseases of the Thyroid Gland**

  - **Hyperthyroidism**: Hyperthyroidism **is an over-production of thyroid hormone from the thyroid glands.**

    - **Common Points in Medical History:** Owners can report a variety of medical complaints with a hyperthyroid patient. The most common is weight loss, which can be mild to severe. Other common symptoms can be:

      - Increased Appetite (Ravenous)
      - Increased thirst and urination
      - Explosive Energy (Hyperactive)
      - Shedding / Hair Loss
      - Behavior Changes
      - Gastrointestinal Signs

    - **Common Points on Initial Assessment:** Affected animals are generally; stable, bright, alert and responsive. They may show the following symptoms on initial assessment:

      - Thin to Emaciated animals
      - Generalized poor muscle mass
      - Tachycardia
      - Poor Hair Coat
      - Palpable Thyroid gland (See above)

    - **Clinical Diagnostics:** Total / Free T_4

    - **Treatment:** The basic treatment options are:

      - **Medication**
      - **Surgical removal of the thyroid gland (Thyroidectomy)**
      - **Radioactive Iodine Therapy**

- **Hypothyroidism:** Hypothyroidism is an under production of thyroid gland from Pituitary or Idiopathic / Immune Mediated disease of the thyroid (See above).

  - **Common Points in Medical History:**

    - **Chronic Obesity**
    - **Chronic Skin / Shedding Issues**
    - **Decreased Energy**
    - **Animal becomes heat seeking**
    - **Reproductive issues**

  - **Common points on Initial Assessment:** The concern of low thyroid may be associated with older animals with poor skin, ears, allergy, and obesity issues.

  - **Clinical Diagnostics:** Total / Free T_4

  - **Treatment:** Medication

- **The Adrenal Gland:**

  - **General:** The adrenal glands are organs that respond to controlling chronic and acute stress in the body by regulating blood pressure, heart rate, bronchodilatation, electrolyte balance, and emergency blood sugar levels. The adrenal glands are small peanut shaped glands that sit cranial to both left and right kidney. The gland is composed of two distinctive and separate tissues, and each part has a different function**.**

    - **Adrenal Cortex**: is the outer tissue layer responsible for producing different types of steroids for maintenance of blood sugar, electrolytes and sex steroid production. The cortex has three distinct levels and compromises 75% of the entire gland. It comprised of three distinct tissue layers:

      - **Zona granulosa**
      - **Zona fasciculata**
      - **Zona reticularis**

    - **Adrenal Medulla**: is the section of tissue in the middle of the gland that is responsible for producing **epinephrine** to assist the body in times of crisis or life and death concern (**Fight or Flight System).**

- **Endocrine Function - Adrenal - Pituitary Axis - The production of cortisol:** Cortisol is produced by the adrenal cortex to take protein and fat and turn them into glucose in times of low blood sugar. The process is controlled by a small gland in the brain called the **pituitary gland**, also called the master gland. When the brain senses low blood sugar; the pituitary gland releases a hormone called **ACTH** to stimulate the adrenal gland to produce cortisol. ACTH is released into the blood stream until it encounters specific protein receptors in the adrenal cortex to stimulate the release of cortisol. Cortisol is then released into the blood stream to stimulate the breakdown of protein and fat into sugar. As cortisol levels rise in the body, the pituitary decreases the amount of ACTH release. **This is called a negative feedback loop.**

- **Hyperadrenocorticism (Cushing's disease**), which is an over production of cortisol from the body caused a primary adrenal or pituitary disease. There are three overall forms of the disease:

    - **Pituitary Dependent Hyperadrenocorticism (PDH)**
    - **Adrenal Tumor – Neoplasia**
    - **Iatrogenic Cause**

- **Obtaining a medical history for Adrenal Disease:** Some basic questions for the client are:

    - How old is the pet?
    - Is there breed specificity for adrenal disease?.
    - Has the progression of the disease been sudden or chronic?
    - Has there been a sharp increase in water consumption (polydipsia) or urination (polyuria)?
    - Has the animal been on oral steroidal medication (Prednisone)?

- **Initial Assessment of pets with Adrenal Disease:** Common notable changes can be:

    - **Pendulous Abdomen**
    - **Flank Alopecia**
    - **Increased Pigmentation of the skin**

- **Routine Diagnostics:**

    - **Complete Blood Count:** The complete blood count can be essentially normal, however on occasion; a **stress leukogram** can be seen.

- **Serum: Lipemic:** Patients with hypothyroidism can have decreased fat metabolism leading to an increased lipemic serum.

- **Chemistry:** Blood work on a routine chemistry can be extremely variable. **There is no absolute baseline test for Adrenal disease on routine chemistries; however some observed changes can be:**

  - **Alkaline Phosphatase**
  - **Cholesterol**
  - **Blood sugar**

- **Urinalysis:** With Cushing's disease**,** the ability of the kidneys to concentrate urine can be affected.

- **Radiology:** Abdominal radiographs are used to assess organ enlargement (i.e. Hepatomegally) or potential adrenal masses associated with Cushing's disease.

- **Urine Cortisol / Creatinine Ratio**: In animals with Cushing's disease, the excess cortisol is excreted by the kidneys increasing the amount of Cortisol in comparison to the normal levels of Creatinine in the urine.

- **ACTH Stimulation test**

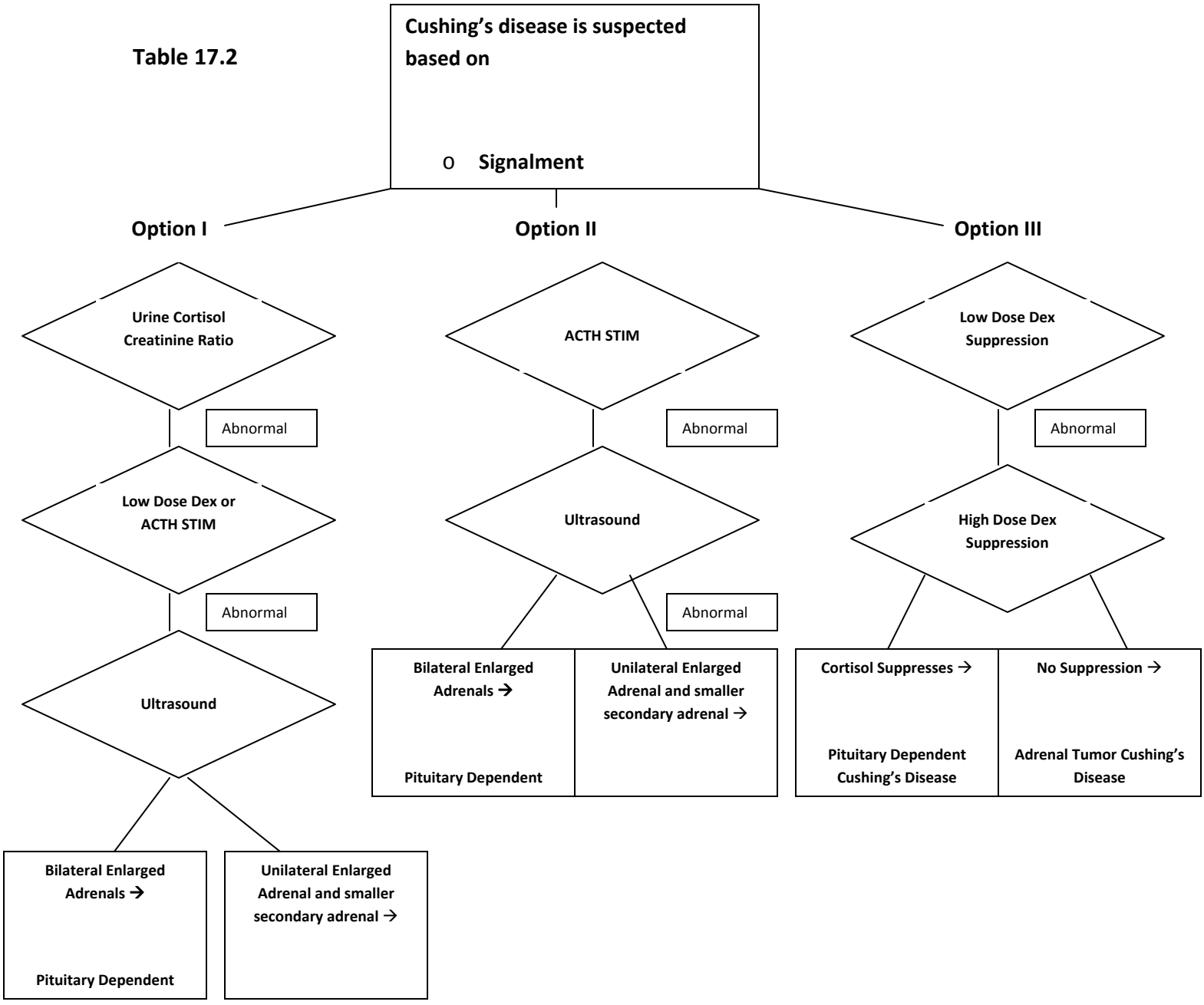
- **Low Dose Dexamethasone Suppression Test**

- **High Dose Dexamethasone Suppression Test**

- **Ultrasound**: Ultrasound can help detect:

  - Pituitary Dependent Disease
  - Adrenal tumor
  - With a Pheochromocytoma (Epinephrine producing tumor of the Adrenal Medulla)

Table 17.2


Cushing's disease is suspected based on
o Signalment
Option I
Option II
Option III
Urine Cortisol Creatinine Ratio
Abnormal
Low Dose Dex or ACTH STIM
Abnormal
Ultrasound
Bilateral Enlarged Adrenals →
Pituitary Dependent
Unilateral Enlarged Adrenal and smaller secondary adrenal →
ACTH STIM
Abnormal
Ultrasound
Abnormal
Bilateral Enlarged Adrenals →
Pituitary Dependent
Unilateral Enlarged Adrenal and smaller secondary adrenal →
Low Dose Dex Suppression
Abnormal
High Dose Dex Suppression
Cortisol Suppresses →
Pituitary Dependent Cushing's Disease
No Suppression →
Adrenal Tumor Cushing's Disease

Otology

- **General**: The ears have two functions; they receive auditory stimuli and maintain equilibrium and balance. The ear is divided into two parts: the external and internal aspects of the ear. In a general practice, the majority of otic disease is presented as an inflammatory external ear problem (**Otitis**). In severe cases, the patient may present with balance and deafness issues.

- **Obtaining a history in patients with otic disease:** Key points when obtaining a history from a patient with ear disease are:

    - Does the pet have a history of chronic ear infections?
    - Does the pet itch, scratch and chew elsewhere, or does the patient have a history of skin allergies?
    - Is the patient (canine) being treated for hypothyroidism?
    - Is the animal a swimmer?
    - Does the animal have a long pendulous pinna that covers the opening of the external ear canal?
    - Does the pet have exposure to strays and other animals?
    - Is there a time of the year (i.e. spring or fall) when the otitis occurs more frequently or is it all year round?
    - Does the patient have any systemic signs of disease (weight gain or loss, increased appetite/water intake/urination, lethargy, etc)?

- **Physical changes to the Eye on Initial Assessment:** When evaluating an animal on an initial assessment, some very simple observation of the ears can tell you a great deal about ear infections and the overall health of the animal. These factors are:

    - Is there debris, odor or purulent discharge evident in the ear canal?
    - Does the ear canal appear to be narrowed?
    - Is there unusual pigment or bruising to the ear flap?
    - Does the pet have a balance problem, rapid side to side eye movement or act as if he or she cannot balance themselves?
    - Does the patient exhibit Oral Pain?
    - Does the patient have decreased ability to hear?
    - Is there a facial paralysis, a Horner's syndrome, or evidence of Keratoconjunctiva sicca?
    - Is there a head tilt, circling toward affected side?
    - Is there ataxia, vomiting, or nausea evident?

- **Thorough clinical diagnostic testing for chronic ear infections can include:**

    - **Ear cytology**
    - **Ear Mite Cytology**
    - **Culture and Sensitivity**
    - **Diagnostic Blood work**:

        - Complete Blood Count
        - Chemistry Panel
        - Thyroid Panel
        - Viral Serology: Felv / FIV

    - **C/T – Head**

- **Diseases of the Ear**

    - **Ear Infections (Otitis)** Typically, Ear infections are inflammation and / or infection of the external ear canal by bacterial or fungal infections. These infections (**Otitis externa**) are generally the most common and benign. More rarely, infections of the inner ear canal (**Otitis media or Otitis interna**) can be much more serious as the infection can begin to affect balance.

    - **Common Points in Medical History:** Patients will present with a history of shaking the head, rubbing at their ears, malodor coming from the ears, ear sensitivity, and observable debris within the ear canal.

    - **Common Observations on Initial Examination:** Physical symptoms are dependent on the type of ear infection, its chronicity, and severity of infection. Common signs may be:

    - Physical signs with **Otitis Externa**:

        - Ears appear red and inflamed
        - Scratching of the ears
        - Tilting of the head
        - Pain and sensitivity around the ear
        - Odor and debris in the ear canal

    - Physical signs of **inner or middle ear infection (Otitis Media / Interna):**

        - Shaking of the head
        - Smell noted from the ears

- Ears appear red and inflamed
- Tilting of the head
- Pain and sensitivity around the ear
- Problems walking / Incoordination
- Vomiting / Nausea
- Inability to eat properly
- Rapid movement of the eyes back and forth (**Nystagmus**)
- Elevation of the third eyelid

- **Diagnosis:** See above

- **Treatment:**

  - Topical medications
  - Systemic Medications

    - Antibiotics
    - Steroidal Medication

  - Surgical Ear Flush / Otoscopy
  - Surgical Repair to the ear canal and opening of the inner ear drum

Topical Therapy

Condition	Topical Product	Indications/mechanism of action/Frequency of Use	Contraindications / Side Effects	Other recommended topical products
Normal to mildly Dry Hair Coat	Mild cleansing and Moisturizing shampoo/conditioner	Recommended for weekly use.	…	--
Bacterial Skin Infections	Chlorhexidine 0.5-4.0%	Works well in organic debris, up to 48hr residual activity Effective for Yeast Infections at higher concentrations	…	…
	Povidone - Iodine	Works well for bacterial and fungal infections	Inactivated by organic debris, only 4-6hr duration of residual activity Can Cause Contact Dermatitis	…

	Benzoyl Peroxide	**Excellent for degreasing and removing scales** **Used for Oily Hair Coat**	**Can be irritating and drying to the hair coat**	**Follow with conditioner**
	Triclosan	**A good disinfectant added to some antiseborrheic shampoos**	**…**	**…**
	Ethyl lactate	**A mild non-drying antibacterial and antiseborrheic agent**	**…**	**…**
Fungal Infections[1]	**Chlorhexidine 2.0-4.0%**	**Effective for Yeast Infections at higher concentrations**	**These preparations are less effective at treating dermatophytes**	**…**

[1] Owners must be cautioned that some Fungal Infections (I.e. Ringworm) is zoonotic.

	Miconazole / Ketoconazole	**Used for yeast and ringworm infections**	**…**	**…**
	Povidone - Iodine	**Works well for bacterial and fungal infections**	**Inactivated by organic debris** **Can Cause Contact Dermatitis**	**…**
	Selenium sulfide **(Selsun Blue™)**	**Used for yeast infections with greasy skin changes**	**Can be irritating** **Not to be used on cats.**	**Follow with conditioner**

	Lime Sulfur	**Best topical treatment available for ringworm, both treating the fungal disease and decreasing pruritus**	**Not Degreasing** **Topical treatment has a very potent odor, stains**	**…**
Antiseborrheic Shampoo – Oily Skin	**Benzoyl Peroxide**	**A degreasing shampoo that removes crusts, aids in follicular flushing and has antibacterial effects**	**Can be irritating and drying to the hair coat**	**A conditioner is recommended to help prevent hair coat drying.**
	Tar-free shampoo	**Tar-free shampoo to help degrease and remove scales/crusts without drying the skin**	**…**	**…**
	Tar Shampoo	**A degreasing / descaling shampoo**	**Little to no anti-bacterial effect** **Can be irritating** **Do not use in cats** **Used as a last resort**	**A conditioner is recommended to help prevent hair coat drying.**

	Selenium sulfide **(Selsen Blue™)**	**Used for yeast infections with greasy skin changes**	**Can be irritating** **Not to be used on cats.**	**A conditioner is recommended to help prevent hair coat drying.**
Antiseborrheic Shampoo – Dry Skin	**Sulfur / Salicylic Acid Shampoo**	**This topical treatment helps decreasing dry scaling with mild antibacterial action. The shampoo is non-drying and does help in decreasing pruritus**	**…**	**…**
Anti-Pruritic Treatments	**Colloidal Shampoos and Conditioners**	**Recommended for weekly use.**	**…**	**Topical steroidal / antihistamine leave on conditioner.**

	Antihistamine Shampoos	**Used to help to reduce physical signs of Atopy** **Use of leave on conditioners can help increase duration of effect.**	**Diphenhydramine can be contact sensitizer**	**Topical steroidal / antihistamine leave on conditioner.**
	ADD LIDOCAINE **Pramoxine Conditioner** **(ResiProx)**	**Pramoxine is a topical anesthetic with good residual activity; combined with oatmeal**	**Lidocaine can be contact sensitizer, has short duration of activity**	**Use after oatmeal or Antihistamine Shampoos**

	1% Hydrocortisone Spray	**Mildest topical steroid spray.** **Product comes in spray, shampoos and lotions.**	**Steroid sprays can rarely cause worsening of bacterial infection or local and systemic side effects with long term use.**	**…**
	0.015 % Triamcinolone Acetonide Spray **(Genesis)**	**Water/denatured alcohol base spray that is absorbed quickly after application.** **Very effective at reducing signs of pruritus.**	**Sneezing** **Slight decrease in White Blood Cell population** **Polyuria /Polydipsia (Rare)**	**…**

	Allermyl	**Cleansing/hydrating/antipruritic shampoo and spray** **Non-steroid-based Linoleic acid which helps maintain epidermal barrier** **Also contains Monosaccharides / Vitamin E which have anti-inflammatory effects**	**…**	**…**

The Business of Dermatology: Developing a Team Approach

- An overview to implanting Dermatology Wellness:

1. The goals of the program must be defined. Goals should be finite and attainable.
2. Evaluate the commitment of the staff to dermatology
3. Discuss goals and needs for the program with the entire medical team in order to:

    a. Develop equipment list for new services
    b. Develop Staffing Needs and Job Description
    c. Develop Educational Programs for all new services and equipment

4. Determine if the new services are competitively priced and realistic for the market.
5. Develop educational client educational programs and literature
6. Implement the program
7. Celebrate success

- **Step I – Hospital Teams Must Understand and Agree Upon Goals**
    - Write a mission statement
    - Develop a list of 3-5 finite measurable goals for the new program
- **Step II: Evaluating the commitment of the medical team**
    - Questionnaire
    - Medical Quiz (?)
    - Role Play
    - Independent Evaluator
- **Step III – Developing and reinforcing dermatology services with the medical team**
    - Develop an equipment list needed to perform exceptional dermatology and otology services
    - Outline Staff Responsibilities from entry of the patient to exit and recheck protocols
    - Develop and Implement and Education Curriculum (**Most challenging step)**
    - Develop tools to help the medical team succeed
- **Step IV: Determining the Market for Dermatology Care**
    - Regional Pricing Guides
    - "Secret Shopper" – for competitors and your own services
    - Discuss with colleagues – Do not price fix.

- **Step V – Developing Client Education Material**
    - Communicate your CE meetings, the time the clinics will be closed and the purpose of the meetings.
    - Create or obtain client handouts for medical conditions
    - Utilize your publishing resources

- **Step VI: Implementation**
    - **Develop tools for the medical leadership to evaluate success**
        - Chart Review
        - Leadership Observation
        - "Secret Shopper**"**
    - Give team 1 month to practice program
    - Implement for 6 (months minimum) – unless there is an unforeseen problem
    - Monitor and record goal parameters.

- **Step VII: Celebrate Success**
    - Discuss reward with TEAM
    - Discuss reward with distributors / reps – Think outside the box
    - Communicate how team is doing month to month
    - Celebrate success – make it important to you!!!