CAN'T SWITCH OFF THE ITCH? ALLERGIC DERMATITIS MANAGEMENT AND ANTIMICROBIAL STEWARDSHIP

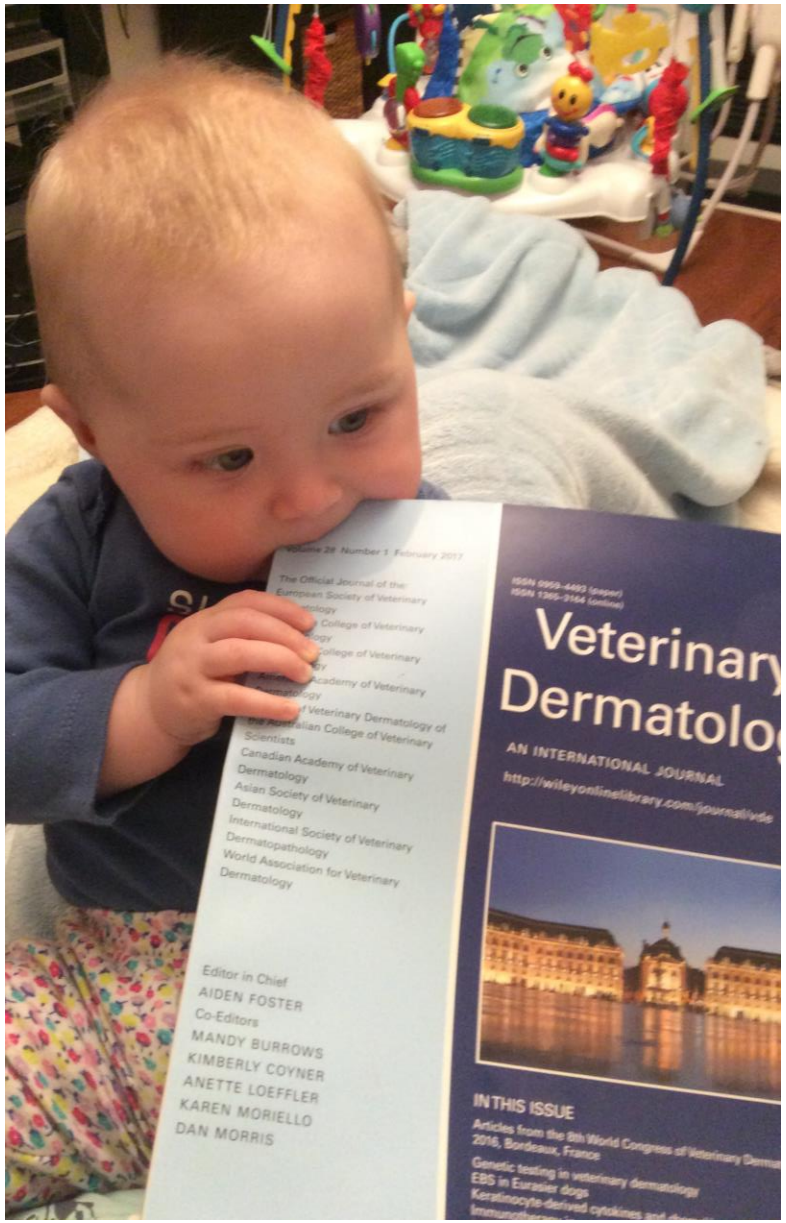
CHARLIE PYE BSC, DVM, DVSC, DACVD

Transforming Lives

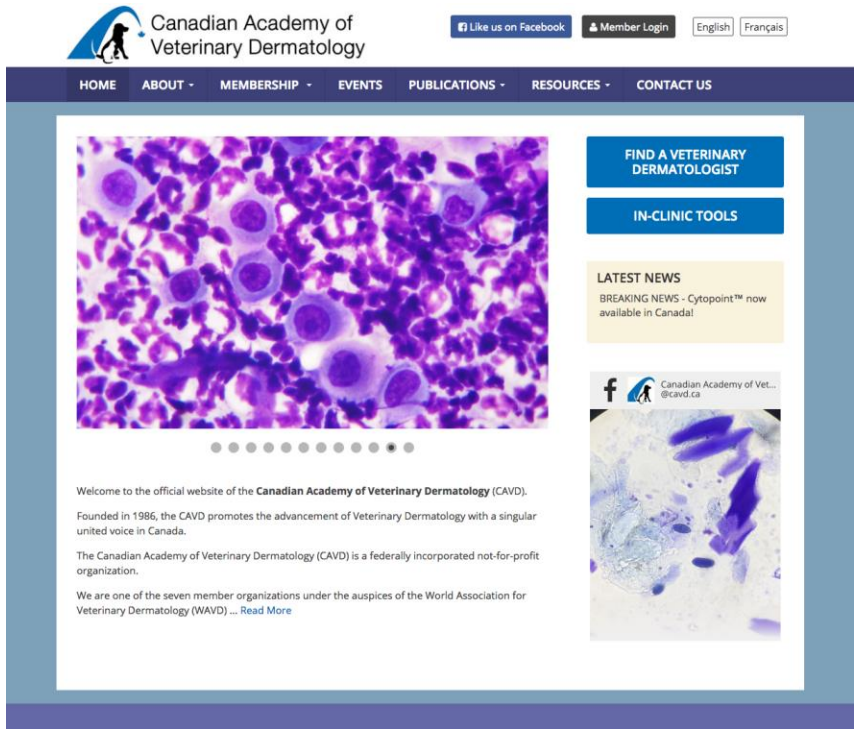
THANK YOU

OVERVIEW

- Clinical signs of atopic dermatitis
- Work-up for atopic dermatitis
- Treatment options for atopic dermatitis
- Antimicrobial stewardship
- Case based approach



CANADIAN ACADEMY OF VETERINARY DERMATOLOGY



Canadian Academy of Veterinary Dermatology

Académie Canadienne de Dermatologie Vétérinaire

- Dedicated to advancing and disseminating knowledge and information about veterinary dermatology
- Keep up to date with developments in this field
  - Bulletin
  - E-newsletter
  - Dermatology CE
- In-clinic tools – topical products, resistance, allergies
- Join us at www.cavd.ca
- Membership $50/year, free for students
- Follow us on

PRURITUS

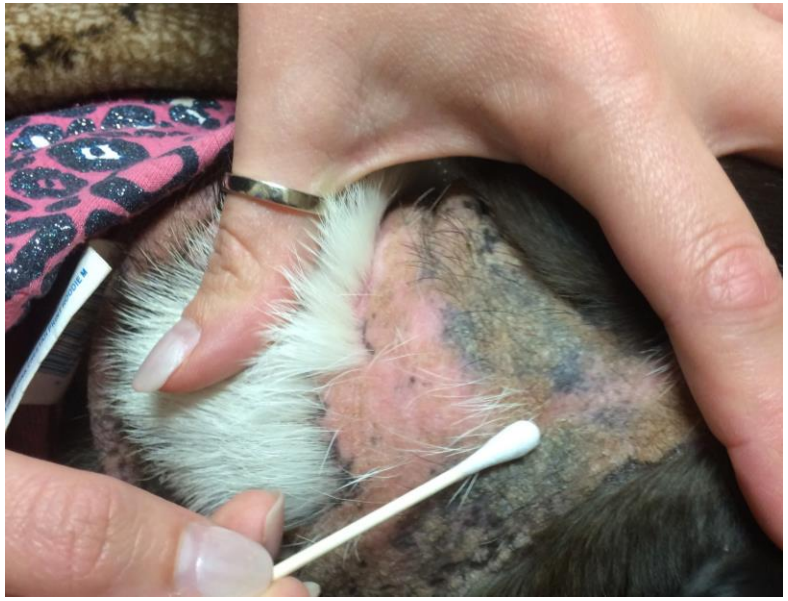
- Pruritus (or itch): unpleasant sensation = scratch
  - Licking, biting, nibbling and rubbing
- #1 pet owner complaint in derm
- Self-protective mechanism
- Wide variety of causes

DIFFERENTIAL DIAGNOSIS

- Allergic skin disease
  - Food
  - Environmental
  - Flea allergy
- Ectoparasites
- Secondary infection
- Dermatophytosis
- Cutaneous epitheliotropic T cell lymphoma
- Cutaneous adverse drug reaction

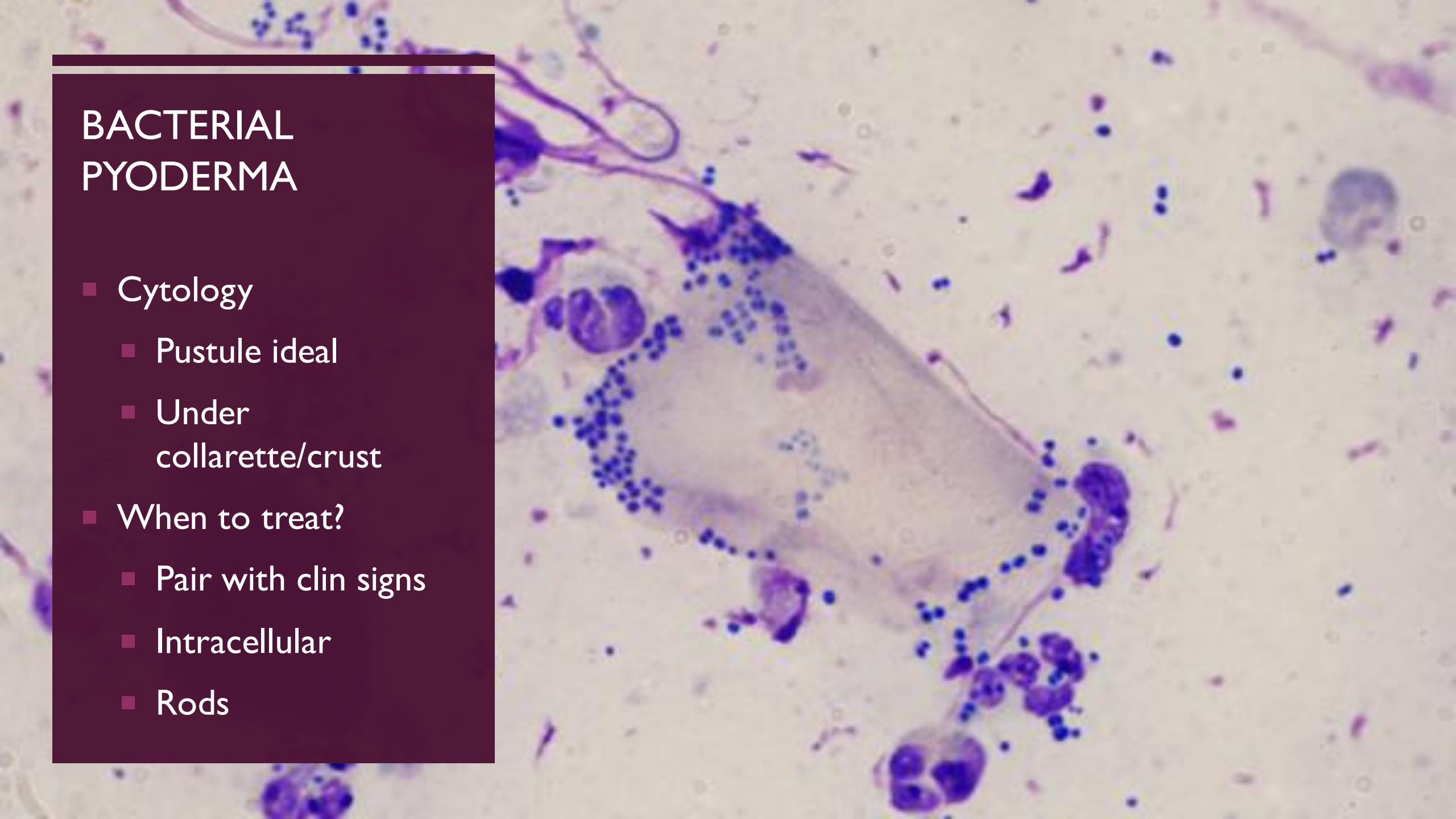
MINIMUM DATABASE

- Cytology
  - Only way to rule in or out infection
  - Infection is secondary
- Skin scrapings
  - Ectoparasiticidal trial -> Isoxazolines
  - Cross reaction between house dust mites (HDM) and Sarcoptes, Otodectes etc
  - **Rule out parasites prior to testing**

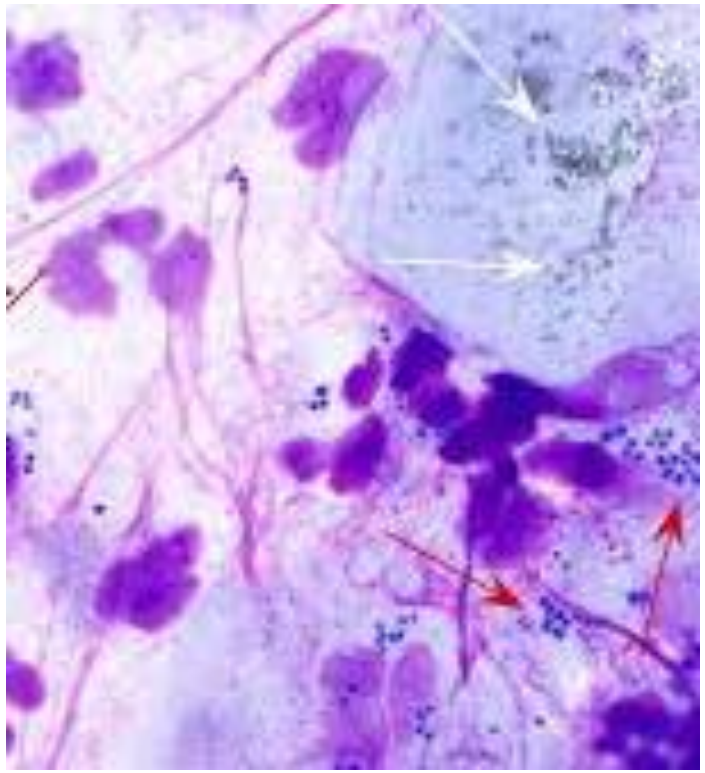


BACTERIAL PYODERMA

- Cytology
  - Pustule ideal
  - Under collarette/crust
- When to treat?
  - Pair with clin signs
  - Intracellular
  - Rods



BACTERIAL PYODERMA

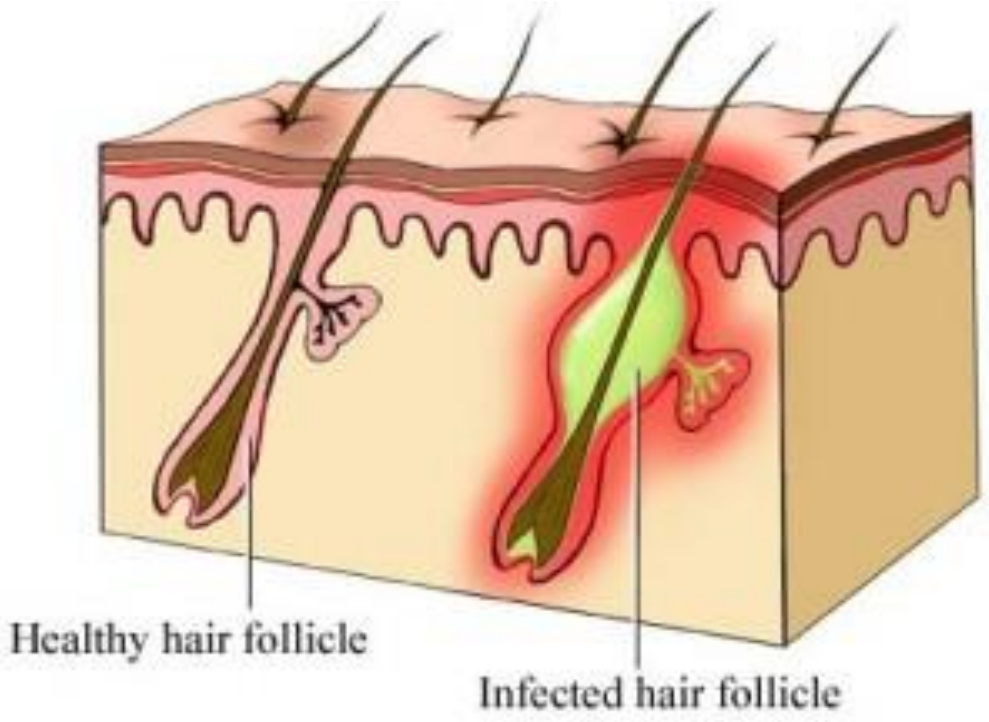


- ***Staphylococcus pseudintermedius***
  - Normal microflora of skin
    - >90% skin infections
- Secondary
  - Underlying cause e.g. allergic disease, endocrinopathies
  - Disrupts microenvironment of the skin
- Chronic, recurrent pyoderma
  - Inappropriate therapy, dosing or duration of treatment
  - Underlying not treated

NOT ALL PYODERMAS ARE CREATED EQUAL

- Surface
  - Facial folds, anatomic locations
  - Topical
- **Superficial**
  - Papules, pustules, crusts, epidermal collarettes
  - **Topical** vs. systemic
  - 3-4 week txt
- Deep (furunculosis)
  - Nodular, draining tracts
  - Systemic
    - 8-12 weeks

SUPERFICIAL PYODERMA (BACTERIAL FOLLICULITIS)



- Infection of follicle
- Inflammatory cells from perifollicular vessels
- **Most common cause of folliculitis in dogs**
  - Demodicosis 2nd Dermatophytosis, 3rd
  - All clinically indistinguishable
  - Diagnostic tests

SUPERFICIAL PYODERMA

Papule

Pustule

Crust

Epidermal collarette

BACTERIAL PYODERMA TREATMENT

- Appropriate antibiotic - Staphylococcal sp.
- Topical vs. systemic
  - Deep = systemic
  - Surface = topical
  - Superficial = **topical** vs systemic
- 3-4 weeks txt superficial – **repeat cytology at end of course**
  - 10-14 days past clinical cure
- 8 -12 weeks treatment for deep – **repeat cytology at end of course**

Veterinary Dermatology

Vet Dermatol 2014; **25**: 163–e43 DOI: 10.1111/vde.12118

Guidelines for the diagnosis and antimicrobial therapy of canine superficial bacterial folliculitis (Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases)

Andrew Hillier*, David H. Lloyd†, J. Scott Weese‡, Joseph M. Blondeau§, Dawn Boothe¶, Edward Breitschwerdt, Luca Guardabassi††, Mark G. Papich**, Shelley Rankin‡‡, John D. Turnidge§§ and Jane E. Sykes¶¶**

CURRENT PYODERMA TREATMENT GUIDELINES

- Consensus statement
  - Topical therapy, using antibacterial agents with proven anti-staphylococcal efficacy, is the recommended treatment modality for any surface and superficial pyoderma
- Consensus statement
  - Topical therapy should be used as the sole on-animal antibacterial treatment for surface and superficial infections whenever a pet and owner can be expected to be compliant

Morris DO, Loeffler A, Davis MF, Guardabassi L, Weese JS. Clinical Consensus Guidelines of the World Association for Veterinary Dermatology. Vet Dermatol 2017;28:304–e69.

TOPICAL THERAPY

- Shampoo, spray, mousse, ointment, wipes
- Chlorhexidine
  - 2 x week shampoo & daily spray
  - As effective as systemic antibiotics for MSSP and MRSP
- Benzoyl Peroxide – twice weekly
  - As effective as 3% chlorhexidine
  - Drying?
- Miconazole
  - In vitro activity against MRSP and MSSP
- CONTACT TIME

Borio S, *et al.* Effectiveness of a combined (4% chlorhexidine digluconate shampoo and solution) protocol in MRS and non-MRS canine superficial pyoderma. Vet Dermatol 2015;26:339–344.

TOPICAL THERAPY

- Fusidic acid
  - Effective against MRSP and MSSP
- Mupirocin
  - Effective against MRSP and MSSP
  - Important topical for treatment of MRSA – no significant resistance developed
- Polymixin-B
- Silver-sulfadiazine
- Sodium hypochlorite (bleach)

Loeffler A, *et al.* In vitro activity of fusidic acid and mupirocin against coagulase-positive staphylococci from pets. J Antimicrob Chemother 2008;62:1301–1304.

OVERCOMING BARRIERS

Time	• Doesn't have to take hours
Labour	• Doesn't have to involve heavy lifting
Perceived difficulty - compliance?	• Many variations
Tolerance of pet	• Positive reinforcement
Adverse reaction	• Different formulations

Shampoo therapy has been recommended for your dog…

…because medicated bathing is one of the safest and most effective ways to treat the skin. Shampoo therapy needs to be done correctly for its full benefits to be realized, so the Canadian Academy of Veterinary Dermatology would like to help you do it right.

Canadian Academy of Veterinary Dermatology

Académie Canadienne de Dermatologie Vétérinaire

How often do I need to shampoo my dog?

To combat an active infection, your veterinarian might ask you to bathe your dog several times a week, even daily at first. The frequency is reduced over time. While pet owners are often concerned about drying out their dog's skin by frequent bathing, this is rarely an issue when using shampoos and topical therapies as prescribed.

What are the benefits of shampoo therapy?

Shampoos directly target the skin, the area we want to reach. They are generally very safe and can be very effective at managing a variety of skin conditions. Shampoo therapy can be used to:

- Treat and prevent **skin infections**, reducing or eliminating the need for antibiotics.
- Remove **crusts, dandruff**, and other accumulated material.
- Reduce the amount of **hair and debris** shed in the home (though immediately after a bath you might notice increased shedding).
- Remove **allergens** from the skin of allergic dogs. These environmental substances, such as house dust mites and pollens, are absorbed through the skin.
- Reduce **itching and inflammation**, and physically soothe the skin.
- Improve the **health** and **barrier function** of the skin to prevent entry of allergens and microbes.
- Make your dog look and smell nice!

BATHING TIPS

- Bathing tips:
  - Use cool/lukewarm water
  - Contact time 5-10 mins
    - Training time in the tub
    - Play outside
    - Start with worst affected areas
    - Rinse thoroughly
  - Towel dry
- No blow dryers, towel dry

BACTERIAL PYODERMA SYSTEMIC TREATMENT

- First tier (empirical selection)
  - Clindamycin
  - 1st generation cephalosporins e.g. cephalexin
  - Amoxicillin and clavulanate
  - Trimethoprim-potentiated sulphonamides
- First or second tier
  - Third generation cephalosporins e.g. cefovecin, cefpodoxime
- ALL OTHER ANTIBIOTICS based on culture

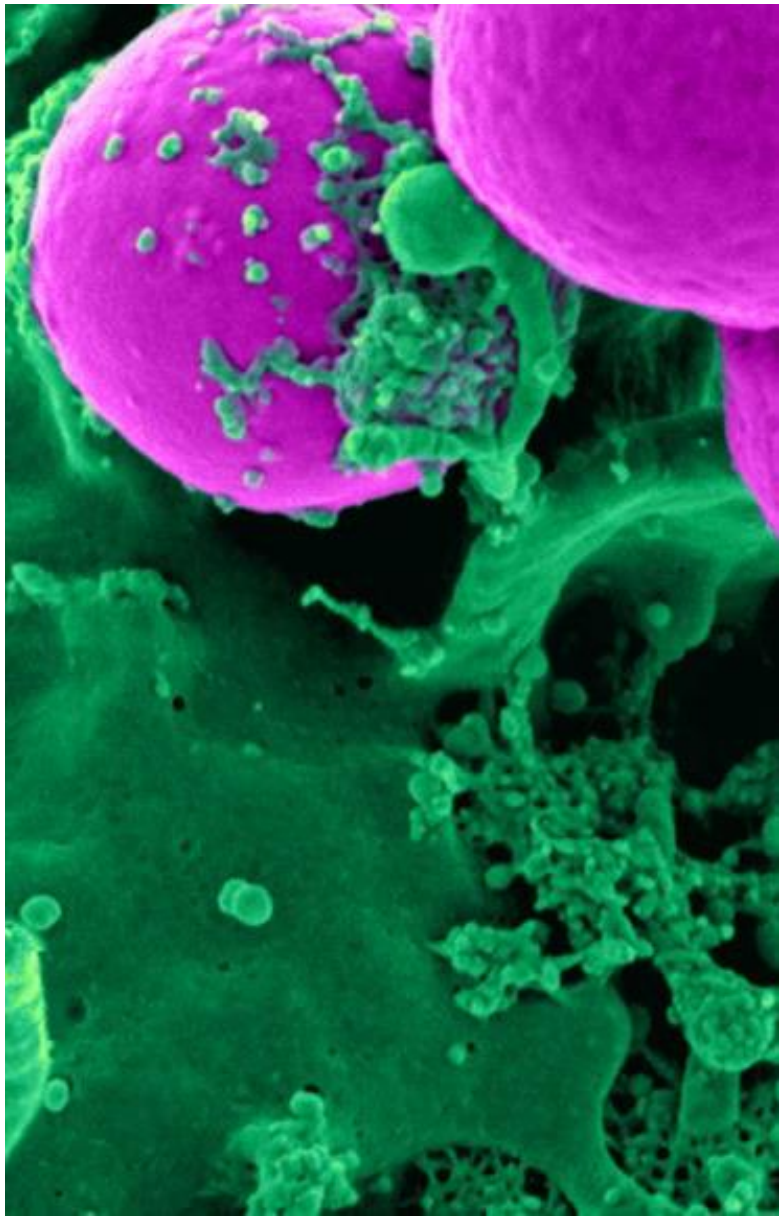
Hillier A, Lloyd DH, Weese JS, *et al.* Veterinary Dermatol, 2014; 25: 163-e43.

WHAT IF IT'S NOT COCCI?

- Rods on cytology
  - Interpret with caution!!
  - Look for neutrophils/high numbers + clinical signs
- Culture prior to systemic antimicrobial use
  - Gram-negative bacteria have many beta-lactamases
  - Varying levels of resistance to ampicillin/cephalosporins and amox-clav
  - Clindamycin - most gram-negative organisms are resistant
- Don't forget topical therapy

WHEN TO CULTURE

- NEVER culture without cytology
  - No resolution with appropriate therapy = culture
- 5 situations may indicate AMD resistance
  - 1. < 50% reduction in lesions in 2 wks
  - 2. New lesions 2 wks + after initiation
  - 3. Residual lesions after 6 wks (+ cocci on cytology)
  - 4. Intracellular rod-shaped bacteria on cytology
  - 5. History of multidrug-resistant infection (ind or household)
- Second-line antimicrobials only used if no sensitivity to first-line



METHICILLIN RESISTANT STAPHYLOCOCCUS PSEUDINTERMEDIUS

- *mec*A and *mec*C
  - Modified PBP = low affinity for BL abx
- Not a product of beta-lactamase production
  - Addition of BL inhibitors does not restore susceptibility
- Often susceptible to amikacin, chloramphenicol, rifampin
- DON'T forget topical therapy
  - MRSP is not more virulent

Bacterial And Fungal Diseases

Resources

- Skin and Ear Cytology Scale
- How to Collect Tape Cytology 🔒
- Cytology for your Derm Cases: Powerpoint Presentation for veterinary clinics 🔒
- WAVD Clinical Consensus Guidelines for Methicillin-Resistant Staphylococci
- ISCAID Guidelines for Canine Superficial Bacterial Folliculitis
- Recommendations for approaches to meticillin-resistant staphylococcal infections of small animals: diagnosis, therapeutic considerations and preventative measures
- Interpreting Small Animal Culture and Susceptibility Reports 🔒
- Precautions when Handling Animals with Antimicrobial Resistant Infections 🔒
- Hand Washing Poster 🔒
- Alcohol Hand Sanitizing Poster 🔒
- CVMA Guidelines for Veterinary Antimicrobial Use (CVMA log-in required) 🔒
- Veterinary Shampoos, Wipes, Mousses and Sprays
- WAVD Clinical Consensus Guidelines for Biology, diagnosis, and treatment of Malassezia dermatitis in dogs and cats
- WAVD Clinical Consensus Guidelines for Diagnosis and treatment of dermatophytosis in dogs and cats

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www.cavd.ca

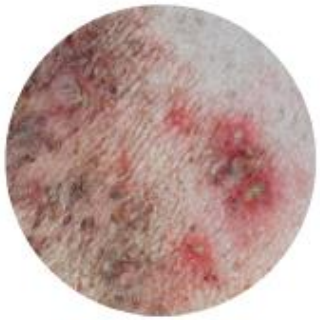
Worms & Germs Blog
Promoting Safe Pet Ownership

MRSP For Pet Owners

What is Methicillin-resistant *Staphylococcus Pseudintermedius*?

Scott Weese DVM, DVSc, DACVIM and **Charlie Pye DVM, DVSc, DACVD**

Staphylococcus pseudintermedius is a bacterium commonly found on the skin, nostrils, mouth, anus and in the intestines of most dogs. This bacterium usually does not cause any problems in healthy animals but is an opportunist, meaning that if there is damage to the skin, such as a wound or an animal with allergies, it can cause an infection. *S. pseudintermedius* is responsible for about 90% of skin infections in dogs with allergies and is also a common cause of ear infections.

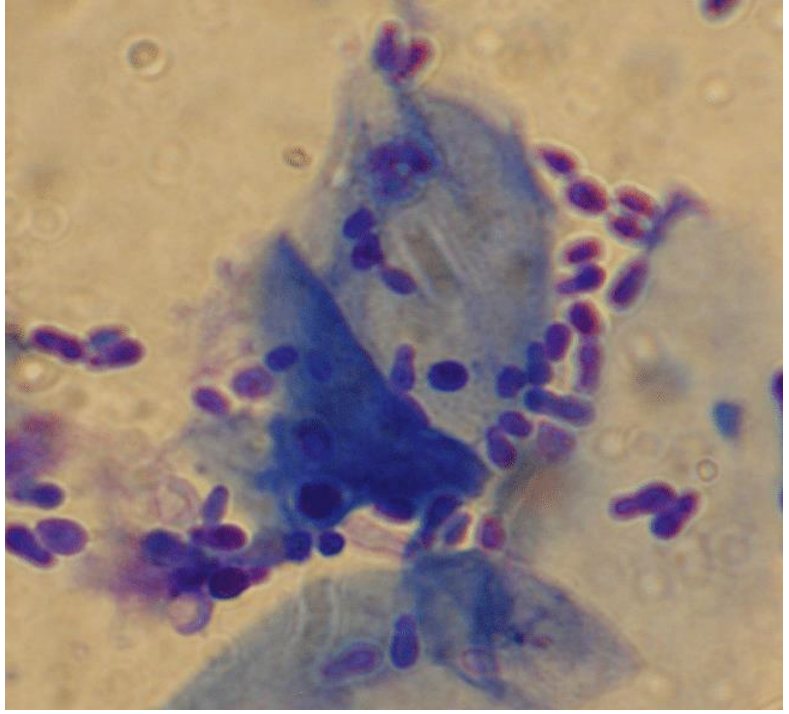


Bacterial skin infection

Bacterial skin infection

TREATING THE YEAST

- EITHER topical or oral
  - Bathing, spray, mousse etc
  - Bloodwork prior to ketoconazole
- Recheck:
  - 28 days for cytology



ALLERGY WORK UP

- Diet trial – **always rule out food first**
- Talk to owners
  - Ask owners to be honest!
    - NOT for ever!!!!
- Anti pruritic therapy for first part of diet trial
  - Taper over time

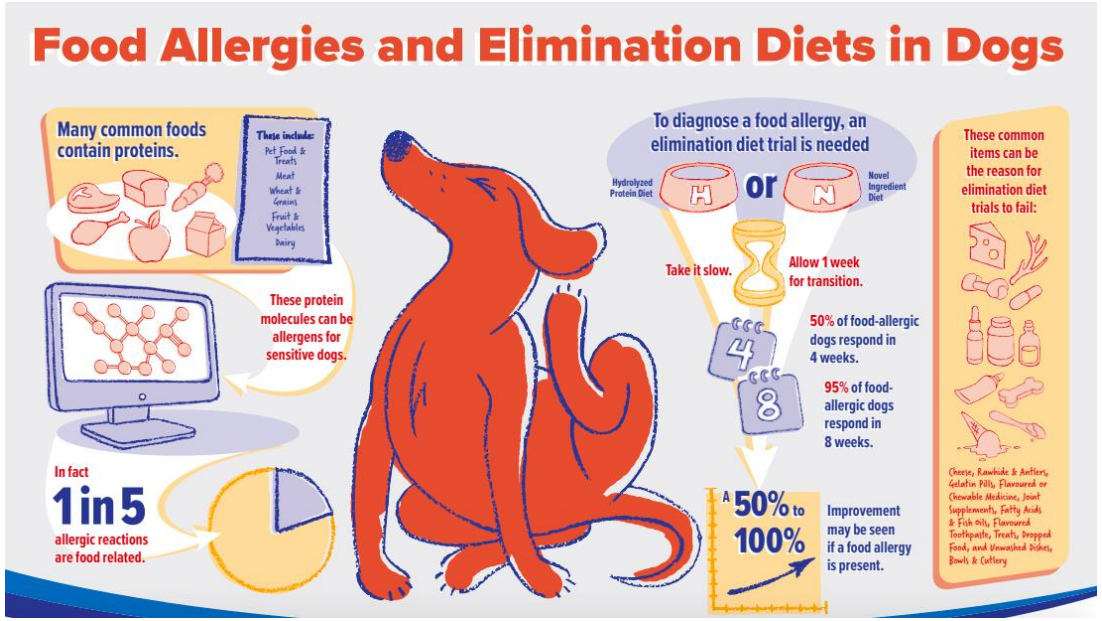
Veterinary Professionals - Atopic Dermatitis and Adverse Food Reactions

Resources

- Critically Appraised Topics on Adverse Food Reactions
- Veterinary Elimination Diets Available in Canada - Dogs 🔒
- Veterinary Elimination Diets Available in Canada - Cats 🔒
- Treatment of canine atopic dermatitis: 2015 updated guidelines (ICADA)

Handouts

- Dog and Cat Itch Scale
- Allergy Assessment Calendar + Printable Blank Calendar Pages
- CAVD Allergy Handout: a resource for dog and cat owners 🔒
- Canine Ear Anatomy Illustration 🔒
- CAVD Illustrated Diet Trial Handout for Dogs 🔒
- CAVD Illustrated Diet Trial Handout for Cats 🔒
- Elimination Diet Trial Handout for Dogs - Original 🔒
- Elimination Diet Trial Handout for Cats - Original 🔒
- How can we help your pet, Canine atopic dermatitis 🔒



WHEN THE DIET TRIAL FAILS

- Consider atopic dermatitis (**diagnosis of exclusion**)
- Genetics
  - AD/AD = 70-80%; AD/NonAD = 30-40%; NonAD/NonAD = 0-11%
- 4 routes – **Percutaneous**, inhalation, ingestion, conjuctival
- **Most often** 6 months-3 yrs of age (dog)
  - 78% during this time
  - 53.3% Frenchies, 66.7% Shar-Peis during 1st year
  - **Cats 4-5 yrs**
- Management vs cure = **Lifelong**

ATOPIC DERMATITIS

- Inside-out theory
  - IgE mediated (type I)
  - Cell-mediated (type IV)
- Outside-in theory
  - Decreased ceramides
  - Fillaggrin mutations
  - “Crumbly brick wall”
- Combination

AD CLINICAL SIGNS

- Pruritus
- Signs of chronic skin dz
- Coughing, sneezing, rhinitis
- Conjunctivitis
- Behavioural change
- Clinically indistinguishable from CAFR

DIAGNOSIS OF AD

- **Diagnosis of exclusion**
- Favrot's criteria
  - Combination of any 5/8 criteria:
  - 1. Onset of clinical signs under 3 years of age
  - 2. Dog living mostly indoors
  - 3. Glucocorticoid-responsive pruritus
  - 4. Alesional pruritus at onset
  - 5. Affected front feet
  - 6. Affected ear pinnae
  - 7. Non-affected ear margins
  - 8. Non-affected dorso-lumbar area

If only used these criteria would miss 1/5 atopic dogs

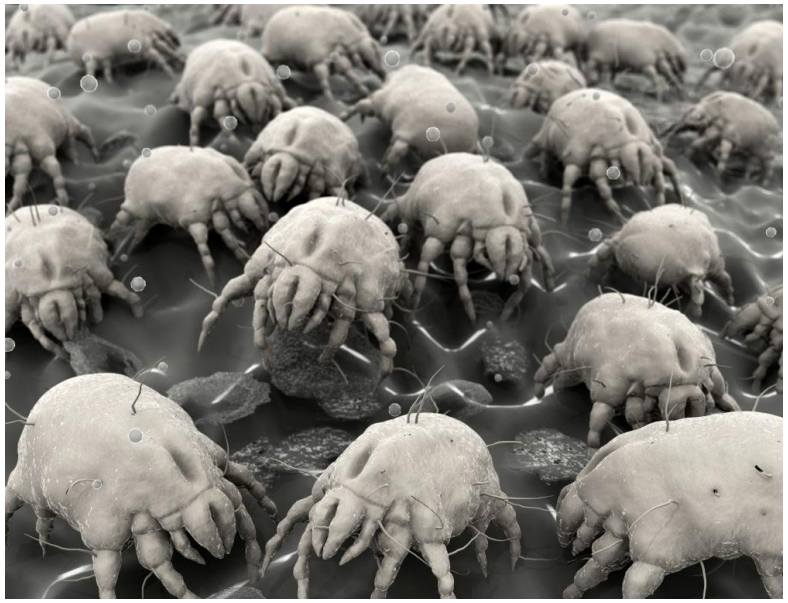
5/8

TREATING ATOPIC DERMATITIS

- Refer for allergy testing
- Medical management
  - 1. Anti-pruritic/anti inflammatory medication e.g. Atopica™ or steroids
  - 2. Anti-pruritic with mild anti-inflammatory properties e.g. Apoquel™
  - 3. Consider anti-pruritic e.g. Cytopoint™
  - Barrier repair, nutritional management, topicals, supplements
- Care giver burden??
- If one isn't working – CHANGE

ENVIRONMENTAL ALLERGY TESTS

- **NOT to diagnose**
  - False positives
- Negative test results do not rule out
- To identify positive reactions to include in ASIT
  - Interpret - history, seasonality and exposure

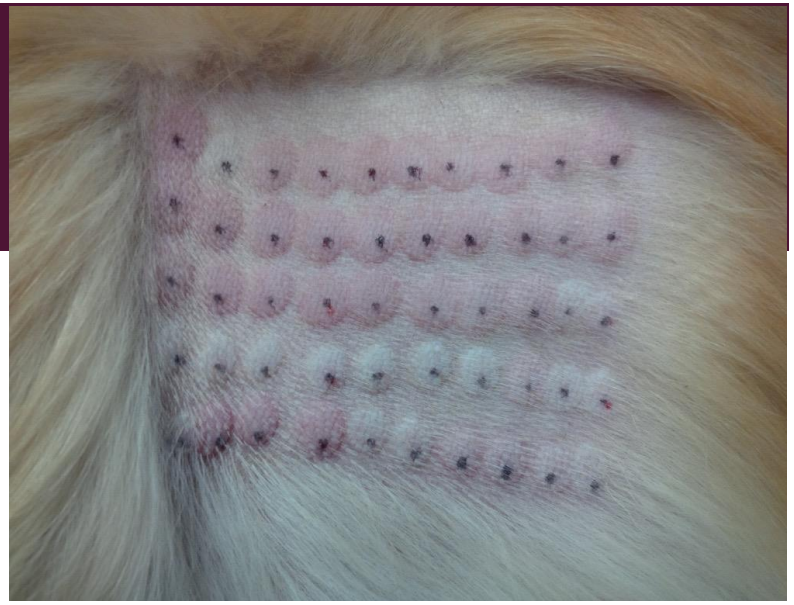


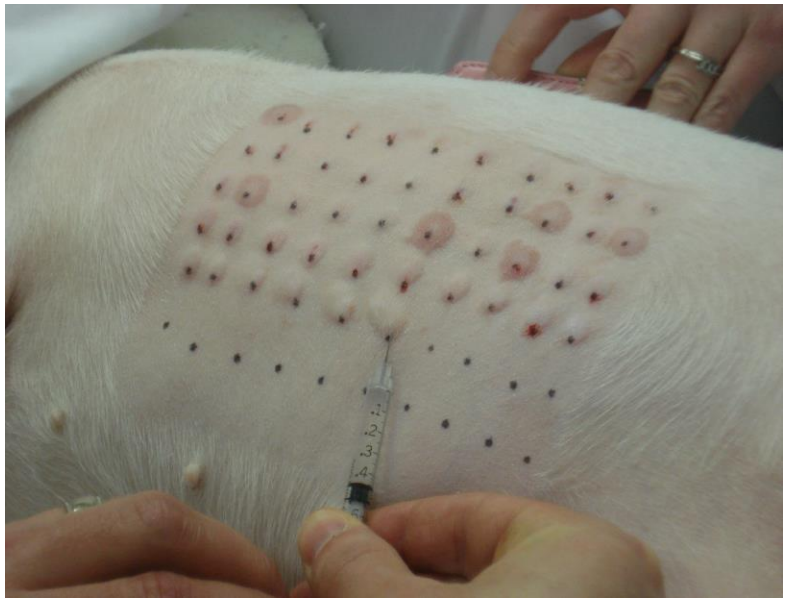
ENVIRONMENTAL ALLERGY TESTS

- Intradermal test (skin test, IDT)
  - Best after peak season
- Serum test
  - Prior to allergy season
- Cross reaction between house dust mites (HDM) and *Sarcoptes*, *Otodectes* etc
  - **Rule out parasites prior to testing**

ALLERGY TESTING

- Intradermal
  - Quick results
  - Referral
  - Gold standard (allergic response in skin) - controls
  - Sedation/shaving
  - Drug withdrawal
- Serum
  - No sedation
  - No drug withdrawal
  - Blood IgE versus skin?
  - Longer results
  - Limitations due to laboratories

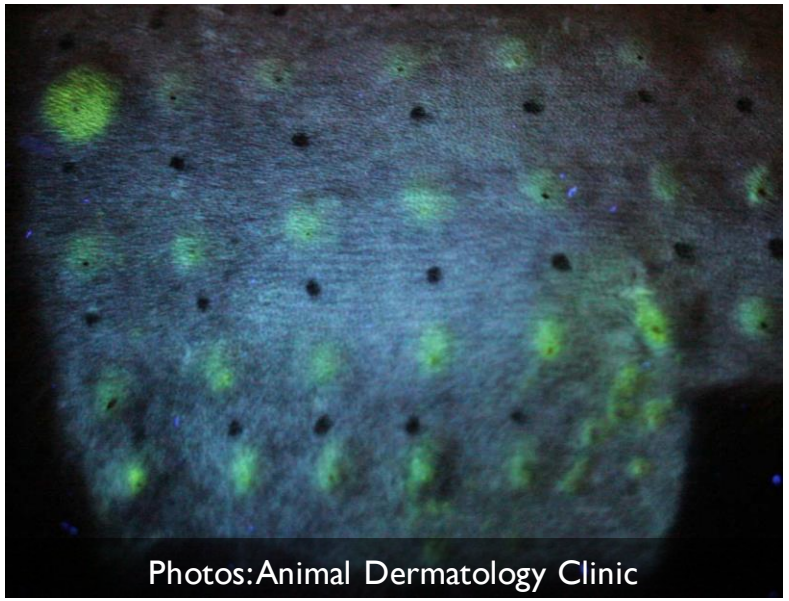




SERUM ALLERGY TESTING

- RAST or ELISA
  - VARL, Idexx, Greer, Spectrum
- Frequency of positive result
  - 1. Heat-inactivated fetal bovine serum
  - 2. Purified canine albumin in saline
  - 3. Pooled serum from specific pathogen free dogs
  - Triplicate to four laboratories
  - 11.1%, 1.4%, 29.1%, 3.3% false positives
- **IMPORTANT to review WITH history of patient**
- Take a part in serum formulation

Deboer DJ, Verbrugge MJ. 2005, Abstracts NAVDF.



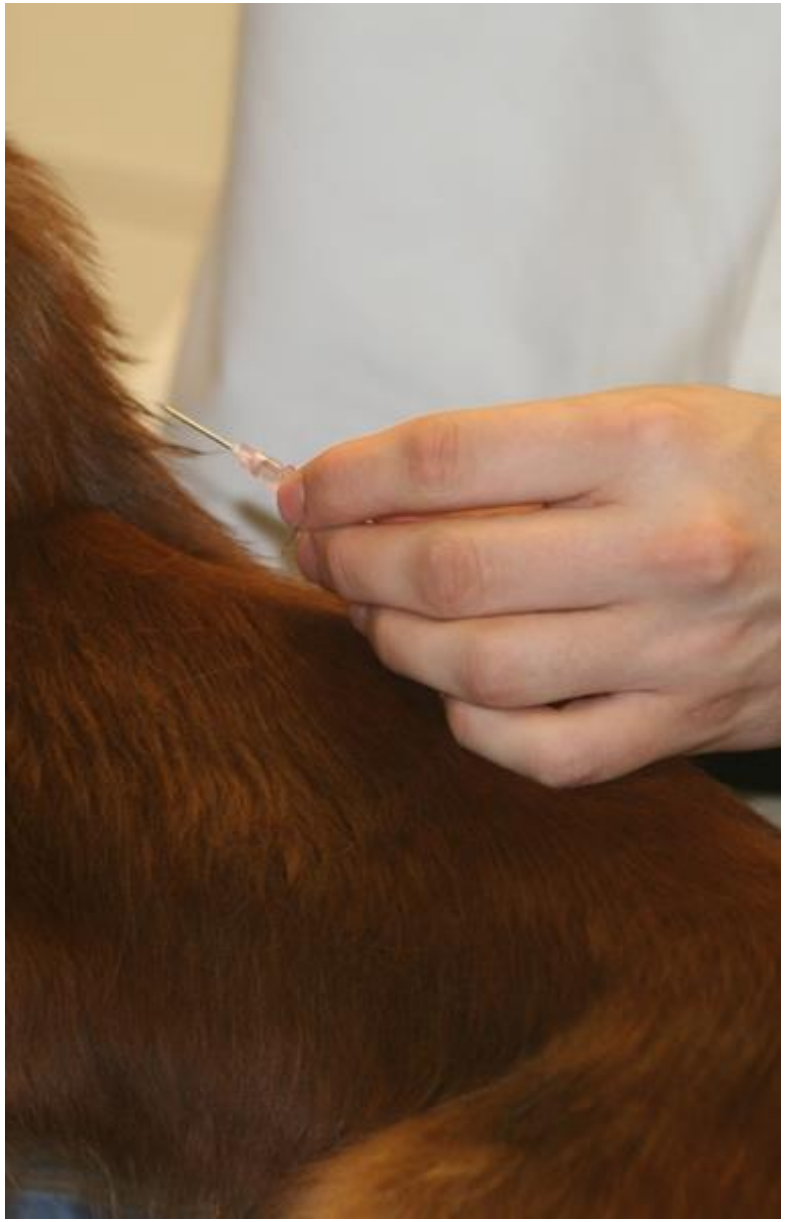
Photos: Animal Dermatology Clinic

INTRADERMAL TESTING IN CATS

- More challenging
  - Thin, tough skin
  - Requires expertise:
    - Ensure injections are intradermal
    - Read reactions – fast
    - Erythematous wheals less common
- Fluorescein stain??
  - IV prior to test
  - Use Wood's lamp to read

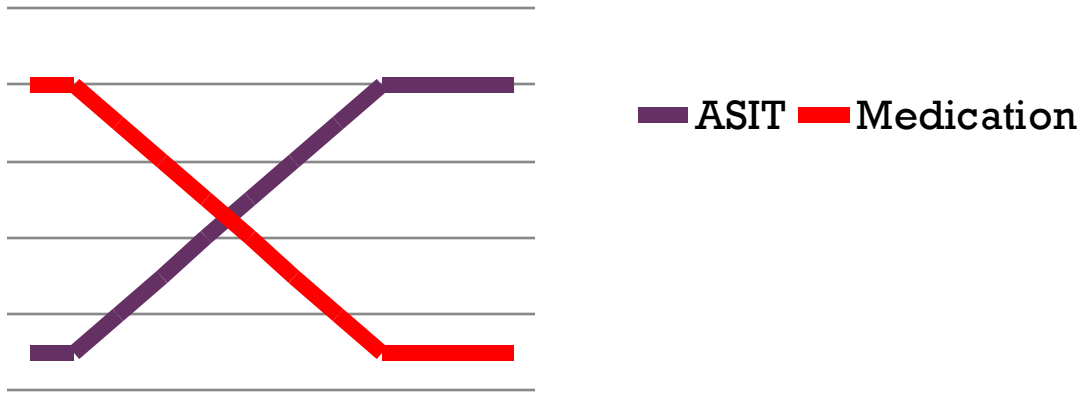
ALLERGEN SPECIFIC IMMUNOTHERAPY

- Subcutaneous vs oral
- Gradually increasing quantities of allergen extract
  - Increase in IgG antibodies
  - Increase Treg cells and IL-10 and decrease in allergen-specific IgE
- Minimal adverse effects
- Efficacy 50-100%
- Adverse reactions rare
  - Pruritus/swelling after injection
  - Systemic reactions (< 1%)
  - Diarrhea, vomiting, urticaria, anaphylaxis



ALLERGEN SPECIFIC IMMUNOTHERAPY

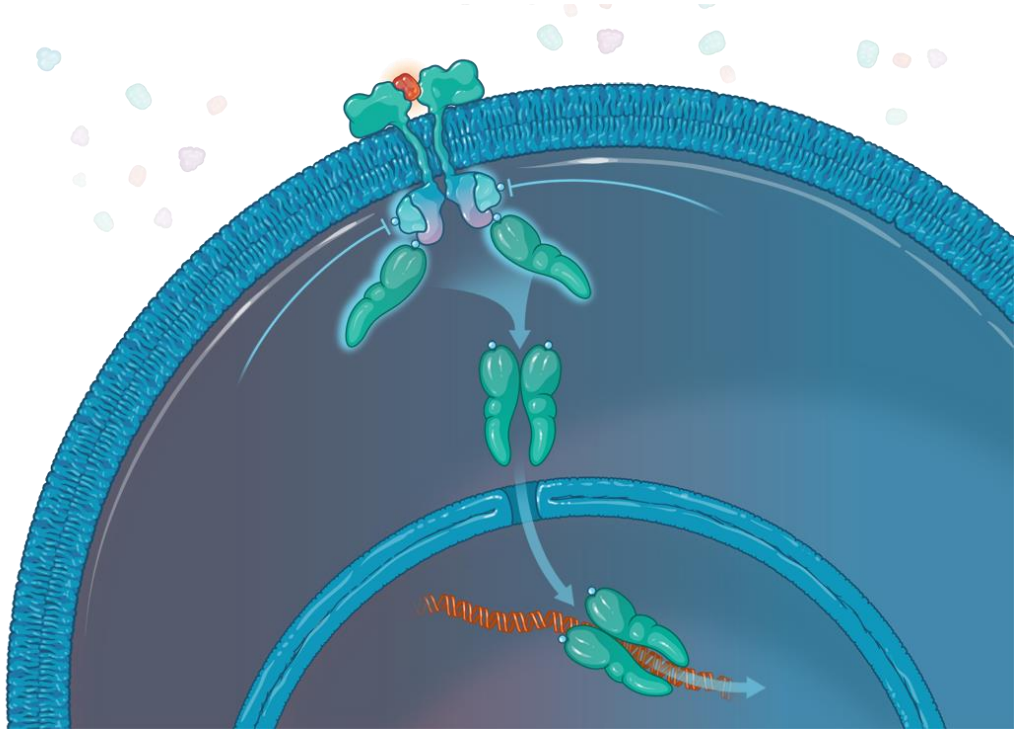
- Subcutaneous injection
- Induction phase - q 2 days to q 7 days
  - Gradually increasing conc.
- Maintenance phase - q 7-28 days
- Oral immunotherapy - daily
- 6-12 months to effect
- No loss of efficacy when receiving EOD pred during induction
- Synergistic effect between ASIT and cyclosporine



Nahm DH, Kim ME. Yonsei Med J. 2012; 53:158-163.

OCLACITINIB (APOQUEL™) ZOETIS

- **ONLY licensed for dogs**
- Janus Kinase (JAK) inhibitor - JAK-1 enzyme
  - Transduction of pro-inflammatory cytokine IL-31
- Oclacitinib inhibits IL-2, IL-4, IL-6 & IL-13
  - Associated w/Th2 cells/allergies
- Reserve for mild inflammation or pruritic individuals



OCLACITINIB (APOQUEL™)

- 0.4-0.6 mg/kg BID for 14 days then SID
- 67% lower pruritus by day 14
  - Rebound at day 15
- Comparable in efficacy and speed of onset to prednisolone
- Rapidly absorbed = Peak plasma concentration <1 hour
- Fasted or fed

Cosgrove S, Wren JA, Cleaver DM. *Vet Dermatol* 2013; 24: 587-e142. Open access.

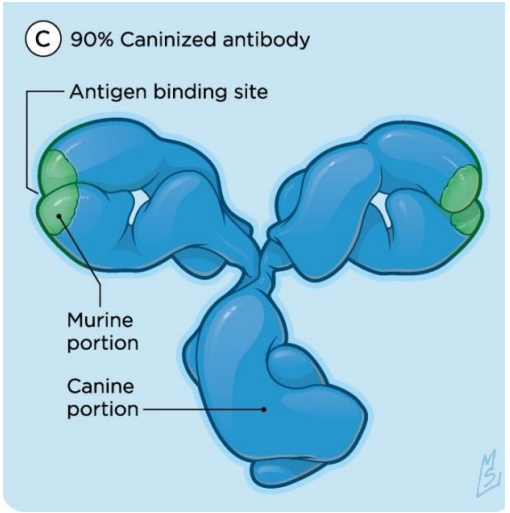
OCLACITINIB (APOQUEL™)

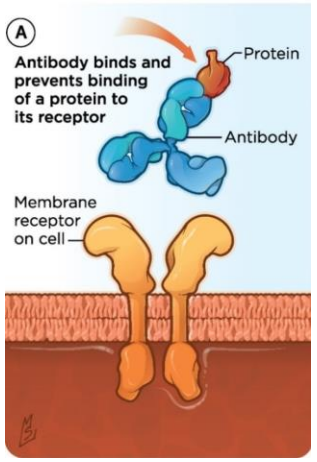
- Not younger than 1 yr or < 3Kg
- Not in immunosuppressed or neoplasia
- Adverse effects:
  - Vomiting, diarrhea, lethargy, decreased appetite
  - Skin and ear infections
  - Cutaneous masses
  - Demodicosis
  - Behaviour changes?
- Interstitial pneumonia, demodicosis, interdigital cysts, neoplasia → higher doses
  - 3 and 5 times dose after 4 months of use

Cosgrove S, Wren JA, Cleaver DM. *Vet Dermatol* 2013; 24: 587-e142. Open access.

LOKIVETMAB (CYTOPOINT™)

- Monoclonal antibody
  - Caninized = ONLY for dogs
- Monoclonal = single lineage of B cells, recognize single epitope
- Targets IL-31 - **ANTI-ITCH**
- SC injection
  - 50-100% bioavailability
- Therapeutic antibodies into blood
- Receptor-mediated cell uptake (endocytosis), transfer to the blood





LOKIVETMAB (CYTOPOINT™)

- **ONLY licensed for dogs**
  - NEVER for cats
- 10, 20, 30 or 40 mg)
- Minimum dose of 2 mg/kg
- Repeat monthly (4-8 weeks)
- Rapid onset of efficacy - within 7 days
  - No immune suppression
  - No contraindications for medications or disease
  - Any age or weight

ADVERSE EVENTS REPORTED IN >2% OF DOGS IN A FIELD SAFETY STUDY[1†]

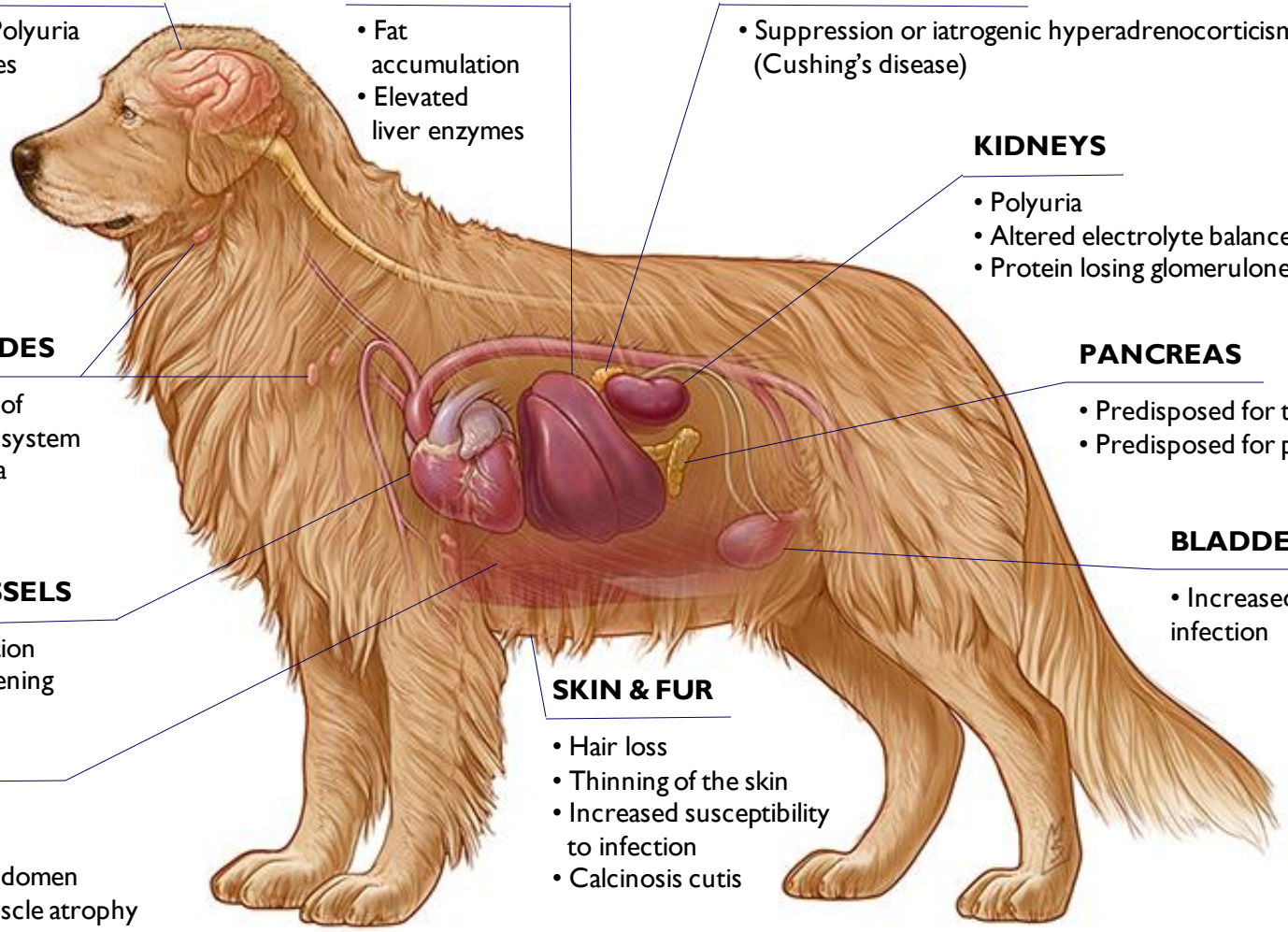
ABNORMAL HEALTH EVENT PREFERRED TERM	PLACEBO (N=83 dogs)	CYTOPOINT™ (N=162 dogs)
Otitis externa	12.0% (10)	**13.0% (21)**
Dermatitis	13.3% (11)	**9.9% (16)**
Bacterial skin infection	12.0% (10)	**9.3% (15)**
Erythema	4.8% (4)	**8.0% (13)**
Vomiting	10.8% (9)	**7.4% (12)**
Anorexia	4.8% (4)	**6.2% (10)**
Lethargy	6.0% (5)	**5.6% (9)**
Pruritus	19.3% (16)	**4.9% (8)**
Diarrhea	4.8% (4)	**3.7% (6)**
Alopecia	7.2% (6)	**2.5% (4)**

*US Data

GLUCOCORTICOIDS

- Potent anti-inflammatory agents
- Vanectyl-P® (dogs)
  - 1 tablet, 10Kg body weight (max 3-4)
- Prednisone/prednisolone (dogs)
  - 1-2 mg/kg q 24 hrs, then taper
- PrednisoLONE (cats)
  - 2-4 mg/kg q 24 hrs, then taper
- Dexamethasone (dogs and cats)
  - 0.05 mg/kg q 24 hrs, then taper (dogs)
  - Cats: 25% calculated dose of pred
- Methylprednisolone (cats)
  - 10-20 mg (6-8 weeks)
- Daily dosing (7-14 days) then taper

CANINE ORGANS AFFECTED BY CORTICOSTEROIDS



CNS
- Polydipsia / Polyuria
- Mood changes

LIVER
- Fat accumulation
- Elevated liver enzymes

ADRENAL GLANDS
- Suppression or iatrogenic hyperadrenocorticism (Cushing's disease)

KIDNEYS
- Polyuria
- Altered electrolyte balance
- Protein losing glomerulonephropathy

LYMPH NODES
- Suppression of the immune system
- Lymphopenia

PANCREAS
- Predisposed for type II diabetes
- Predisposed for pancreatitis

HEART & BLOOD VESSELS
- Water retention
- Muscle weakening

BLADDER
- Increased susceptibility to infection

SKIN & FUR
- Hair loss
- Thinning of the skin
- Increased susceptibility to infection
- Calcinosis cutis

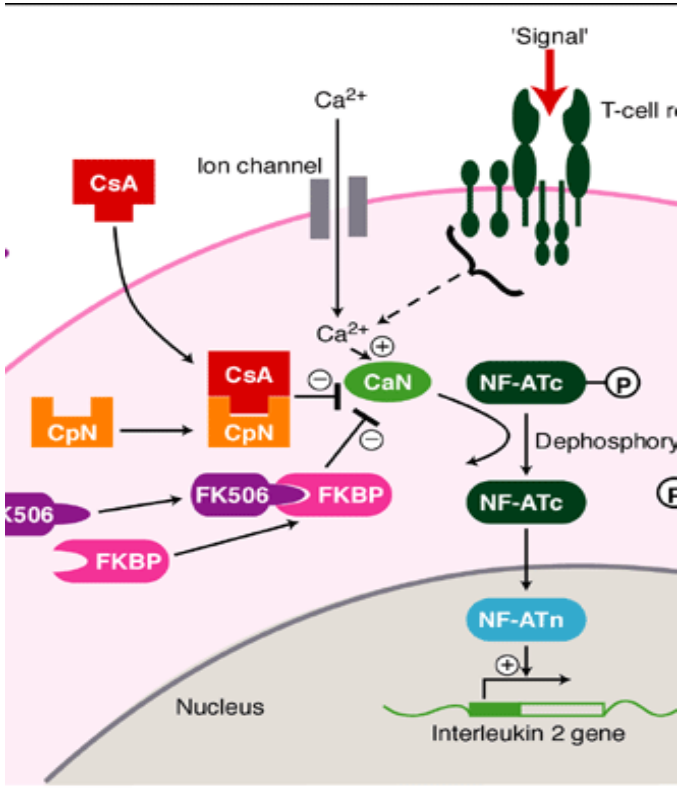
MUSCLE
- Thinning
- Weakness
- Pendulous abdomen
- Temporal muscle atrophy

REFERENCE: Boothe, Dawn Merton. *Small Animal Clinical Pharmacology and Therapeutics*. WB Saunders. Philadelphia 2001. P326-228.

GLUCOCORTICOIDS

- Can use in bursts of 3-7 days
  - No tapering required
- How much steroid is too much?
  - Candace Sousa, Dip ACVD
  - Body weight in Kg x 30 = amount of steroid per year
  - Prednisone/prednisolone
  - E.g. 10 kg dog = 10 x 30 = 300 mg
  - If receiving 5mg per day = 60 days = 2 months over a year

CYCLOSPORINE (ATOPICA™)



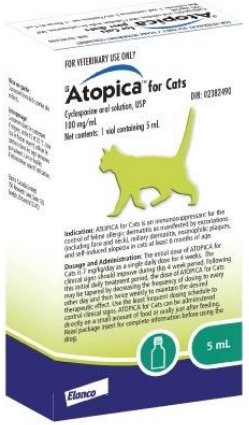
action of cyclosporine or tacrolimus (FK506)

Molecular Medicine © 2000 Cambridge University Press

- Cyclosporine binds to cyclophilin - binds to calcineurin
- NFATc not dephosphorylated - cannot enter nucleus
- IL-2 not synthesized
- Cytokine IL-2
  - Production of antigen primed T (helper) cells
  - Produce more IL-2, TNF-beta and IFN-gamma

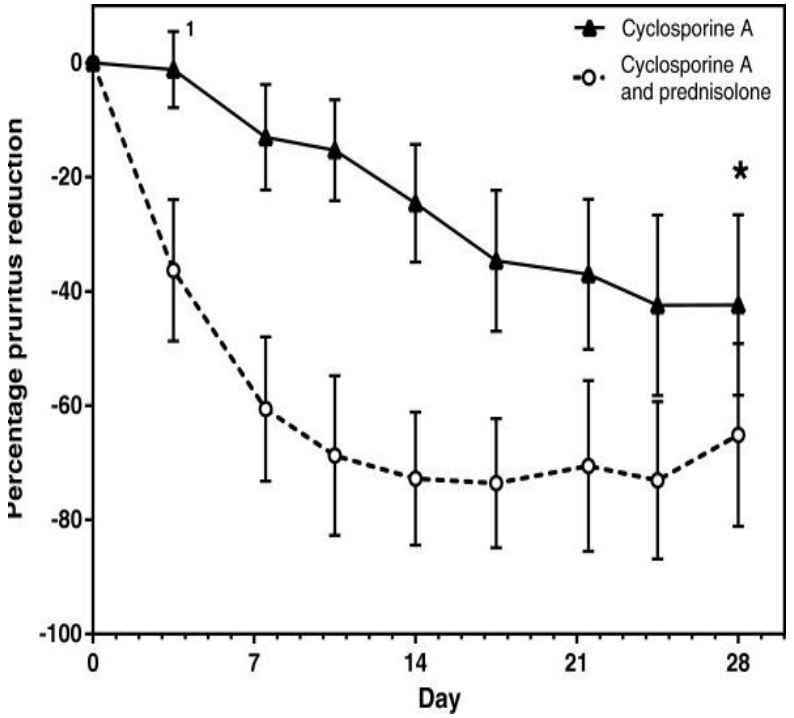
CYCLOSPORINE (ATOPICA™)

- Anti-pruritic, **anti-inflammatory**
- Dogs: 5 mg/kg, PO, q 24 hrs (capsules)
  - Cytochrome P450 pathway in liver
- Cats: 7 mg/kg, PO, q 24 hrs (liquid)
- Daily for at least 4 weeks
- 50% tapered to EOD dosing
- Expensive?



ATOPICA™ AND PRED – CONCURRENT USE STUDY

- Cyclosporine 5 mg/kg +/- prednisolone
  - 1 mg/kg q24 hrs x 7d then EOD x 14 d
- Day 28: Both groups significant improvement
- Both: reduced pruritus by day 3–4, 72.8%
- Cyclosporine: reduced pruritus by day 7–8, 24.7%



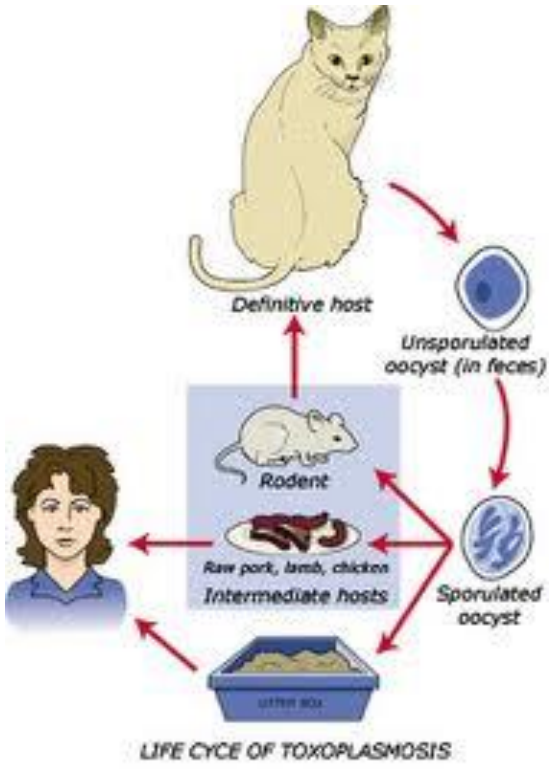
Dip R, Carmichael J, Letellier I. *et al.* Concurrent short-term use of prednisolone with cyclosporine A accelerates pruritus reduction and improvement in clinical scoring in dogs with atopic dermatitis. *BMC Vet Res* **9**, 173 (2013).

Table 1: Analysis of 15 t	Total
Number (%) of dogs	759
Vomiting	26%
Soft stools/diarrhoea	15%
Miscellaneous	3%
Loss of appetite	2%
Nodules/cyst	1%
Urinary tract infection	1%
Gingival hyperplasia	1%
Lethargy/lameness	1%
Reproductive	1%
Papillomatosis	1%
lymphadenopathy	0.8%
Neurological	0.8%
Other urine abnormalities	0.3%
Urticaria/ angio-oedema	0.3%
ADR requiring cessation of therapy	5%
Total	59.2%

ATOPICA™ SIDE EFFECTS

- No concern with killed vaccine
- Increased insulin resistance
- Vomiting/diarrhea/anorexia
  - Give with or without food, fridge
- Gingival hyperplasia - Reversible/treatable
  - Inc. intracellular calcium
  - Collagenase regulated by calcium
  - Cells produce inactive form
  - Increased extracellular matrix

CATS AND ATOPICA™



- Anorexia (cats; caution hepatic lipidosis)
- FIV/FeLV - test prior
- Toxoplasmosis - test titers?
- No hunting or eating raw meat
- Not for outdoor cats
  - If clinical signs occur: Stop medication and treat cat
  - No increased risk to humans; no increased oocyst shedding
- Infectious disease considered with **any** immunomodulatory therapy

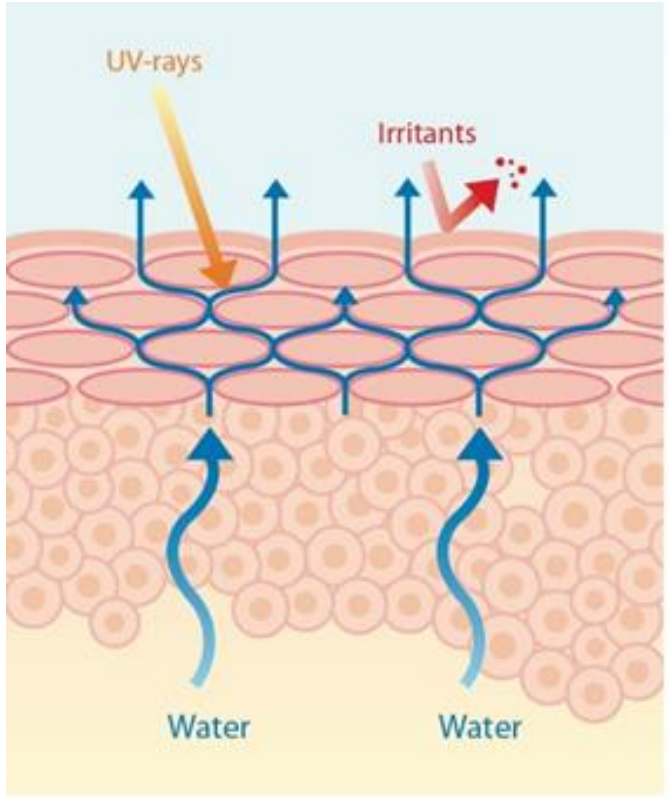
CORTAVANCE™ TOPICAL THERAPY

- 0.0584mg/ml Hydrocortisone aceponate
- Atopic dogs, 84 days
  - > 50% reduction in pruritus
- 1 spray covers area 10 x 10 cm
- At labelled dose, no systemic side effects (7 days)
  - No adrenal suppression
- Twice labelled duration → no bloodwork changes
- Skin thinning? 5 x dose x 14 days, not noted

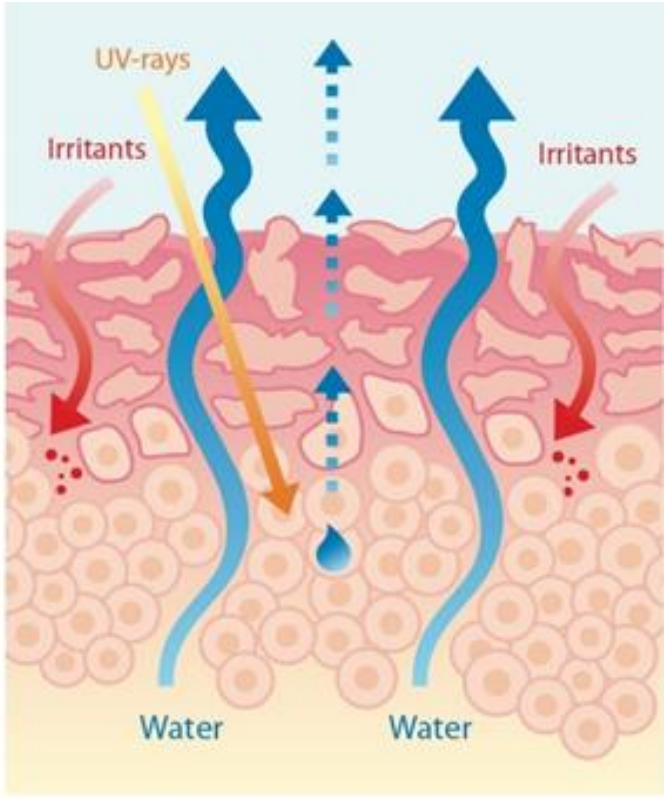
Nuttall TJ, McEwan NA, Bensignor E, *et al. Vet Dermatol* 2012; 23: 4-10.

RESTORATION OF BARRIER FXN

- Disrupted in AD
  - Thinner stratum corneum
  - Decreased ceramides
  - Secondary infections
- Good barrier function
  - Prevent allergen absorption
  - Prevent secondary infection
- Easier than bathing
- Wide safety margins



Normal skin barrier, balanced TEWL

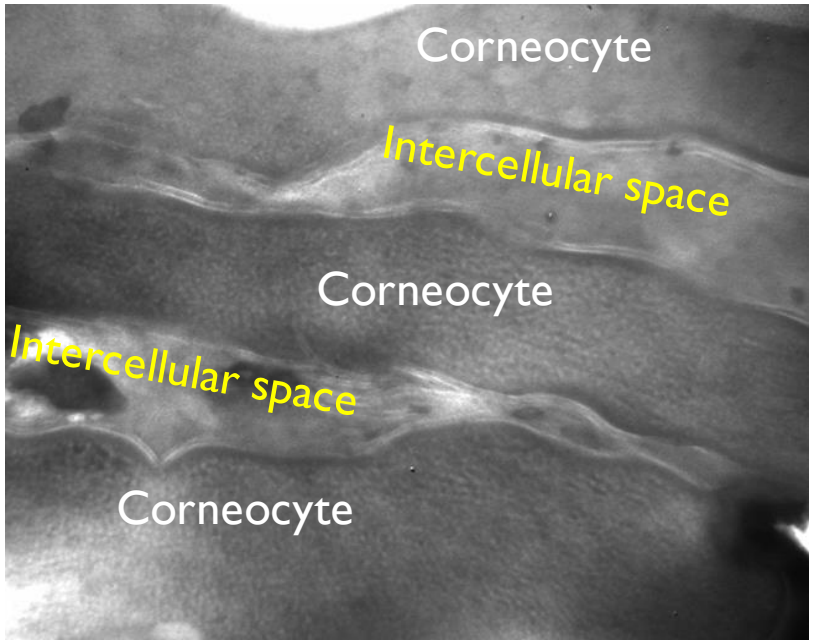


Damaged skin barrier, disbalanced TEWL

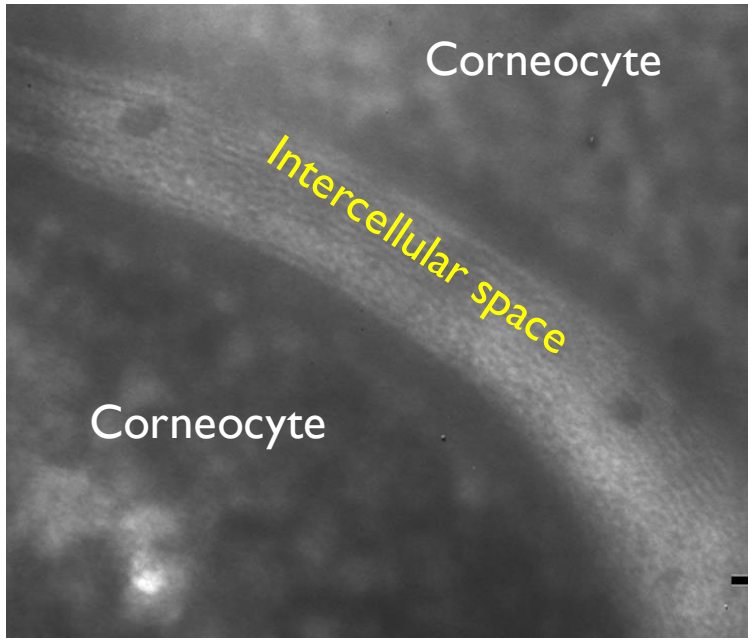
Brand	Allerderm	Douxo Seborrhea	Essential 6
Active ingredient	Skin Lipid Complex (SLC) (ceramides, free fatty acids and cholesterol)	Phytospingosine (PS) A component of ceramides	Essential fatty acids Essential oils
Manufacturer	Virbac	CEVA	Ldca (Aventix)
Loading phase	Once a week for 4 weeks 2-3X/week if severe	Once a week for 3-4 weeks	Once a week for 8 weeks
Maintenance phase	1 monthly application	1 application q 2 weeks	1 application q 2 weeks

TOPICAL LIPID FORMULATIONS

ALLERDERM SPOT-ON® (VIRBAC)



Before treatment, intercellular spaces contain only small amount of lipid lamellae



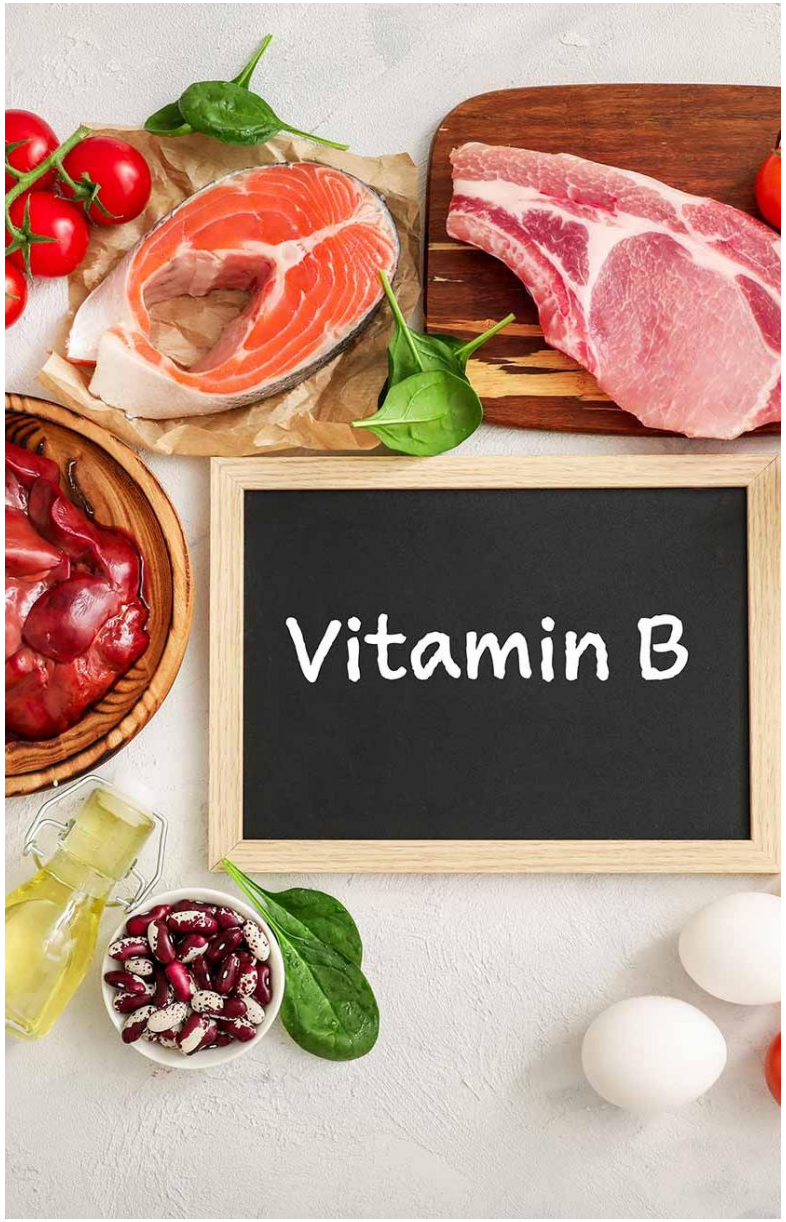
After treatment, intercellular spaces have increased lipid lamellae

NUTRITIONAL MANAGEMENT

- Hill's Derm Complete®
  - Polyphenols
    - Inhibit lymphocytes
    - Inhibit mast cell inflammatory mediator release
  - Egg
    - Egg vs. prednisone
    - Exposed to allergen via intradermal skin testing
    - Similar reduction in acute & delayed cell-mediated immune response

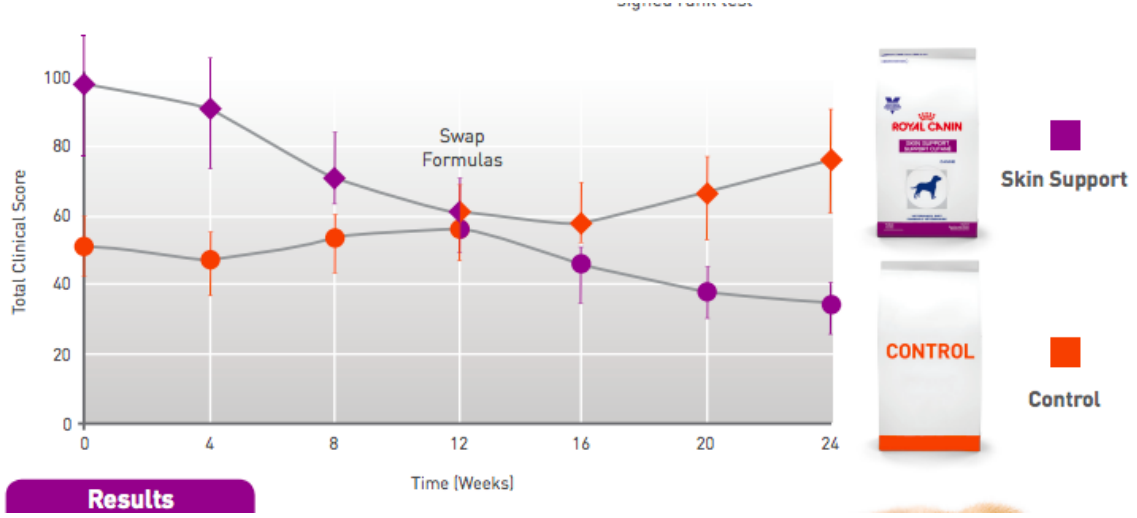
DERM COMPLETE ®

- Supplementing certain minerals can improve skin health (e.g. zinc)
  - Vitamin A - wound healing, hair regrowth and essential for keratinization
  - Vitamins E and C - antioxidants
  - B vitamins - cell renewal and collagen maintenance
  - Vitamin E
    - Decreased CADESI scores



ROYAL CANIN SKIN SUPPORT

- EPA/DHA – healthy skin and coat
  - Reduce inflammation
- Antioxidants promote cell health
- B vitamins and amino acids
  - Reduce TEWL
- Curcumin, aloe vera, vitamin C and taurine
  - Help wound healing
  - Decrease secondary infections
  - Decrease pruritus



Markwell PJ, Svoboda M, Fray T. Dietary intervention can improve clinical signs in dogs with atopy. Proc Waltham Inter Science Symposium. Thailand 2003:21.

WHAT APPROACH DO I USE?

- Short "season": oclacitinib, lokivetmab, glucocorticoids, cyclosporine, nutritional management
- Year round pruritus: ASIT, oclacitinib, lokivetmab, cyclosporine, nutritional management, topical therapy
- Acute flare ups of pruritus: oclacitinib, lokivetmab, glucocorticoids, topical therapy
- Preventative therapy -> Treat atopy BEFORE it becomes a forest fire
  - Start medications at MAINTENANCE dose, longer term nutritional modifications
  - Start 1 month PRIOR to start of season
  - Barrier repair

ALFIE, 10 YR OLD, MN, WEST HIGHLAND WHITE TERRIER

- Adopted 2 months ago with skin disease
  - Pruritic
    - Chews paws, legs, licks abdomen and scratches at face and ventrum
- Receives Advantix™ every month
- Currently eating Purina Sensitive Skin and Stomach
  - Only fish treats
- One other dog - allergies
  - No human affected
- Otherwise healthy

ALFIE

DIFFERENTIAL DIAGNOSIS

- Allergic skin disease
  - Food
  - Environmental
  - Flea allergy
- Ectoparasites
- Secondary infection
- Dermatophytosis
- Cutaneous epitheliotropic T cell lymphoma
- Cutaneous adverse drug reaction???

DIAGNOSTICS

Cytology

- 0-20 cocci/OIF including intracellular cocci
  - Bacterial pyoderma
  - Bathing, chlorhexidine spray
- Ears: 0-20 yeast/OIF
  - Surolan x 14 days

Skin scrapings

- Negative
- Switched to Nexgard ™
  - No improvement

DIAGNOSTICS

- Fungal PCR: Negative
- Bloodwork: WNL
  - Total T4: low
  - TSH: Normal

DIET TRIAL

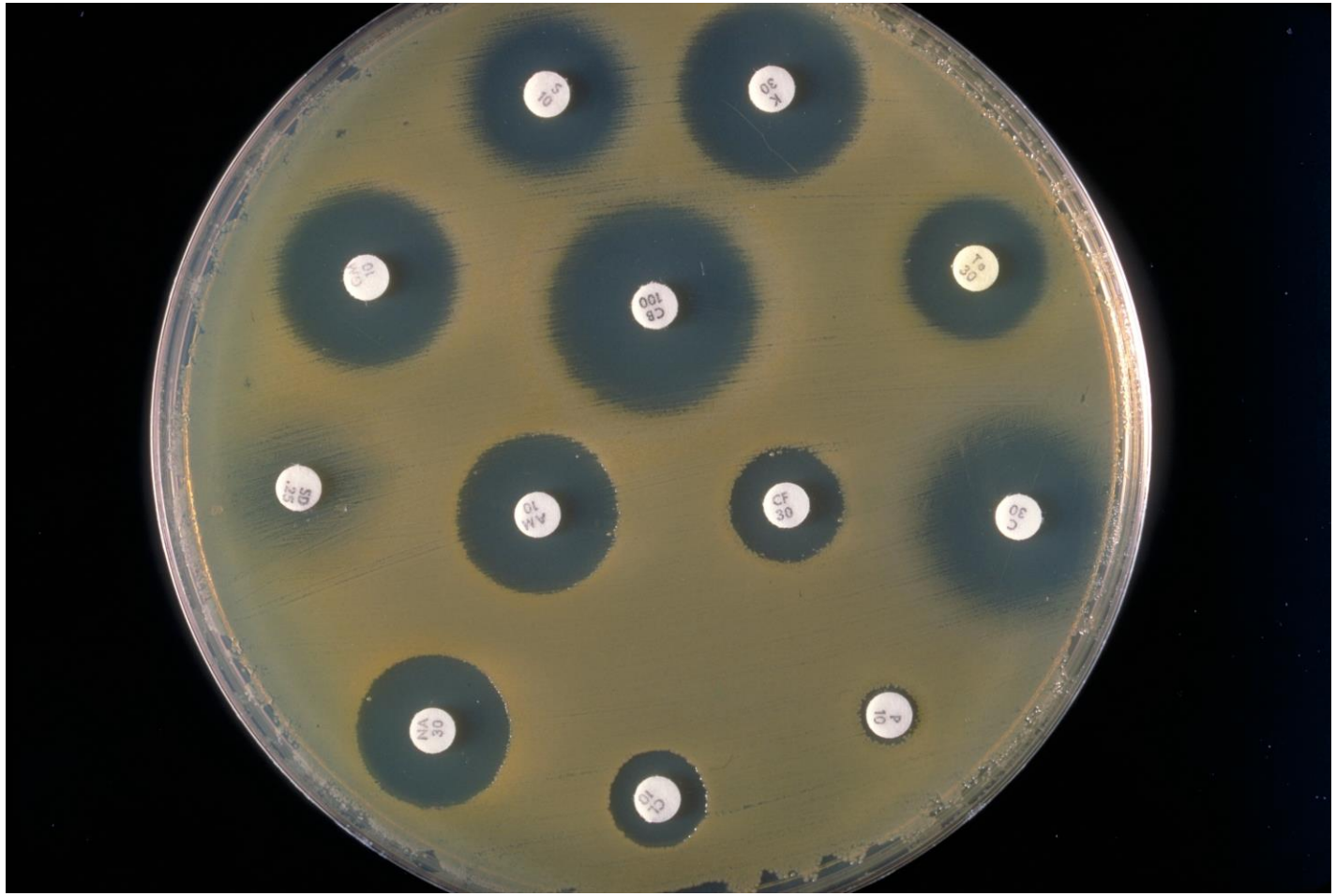
- Switch to vet brand diet
  - Novel protein?
  - Hydrolyzed soy
  - 8 week trial
- Other considerations?
  - No more Nexgard Spectra ™
  - Switch to topical ectoparasitic
- Glucocorticoids x 5-6 weeks
  - Tapering dose

RECHECK

- 2 weeks
  - Repeat ear cytology
  - Decreased pruritus
- 4 weeks
  - Not much improvement
  - Repeat skin cytology
  - 0-10 cocci/OIF + intracellular cocci
  - Continued bacterial pyoderma

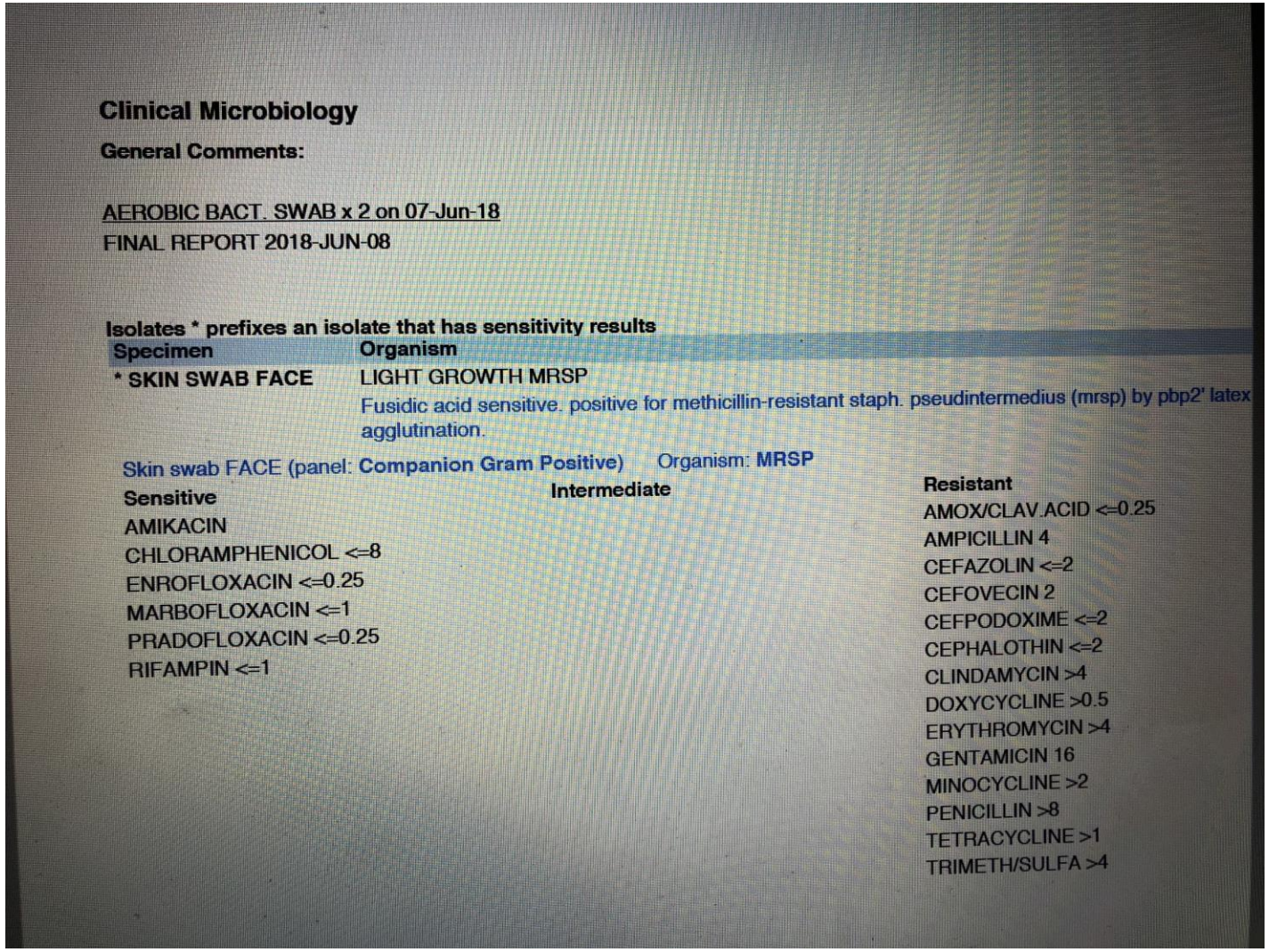
NEXT STEPS

- Topical therapy not resolving pyoderma
  - Alfie becoming resistant to topical therapy
- Unknown exposure to antibiotics
- Culture and sensitivity



C & S RESULTS

- Methicillin Resistant Staphylococcus pseudintermedius
- Systemic therapy
  - Repeat cytology x 4 wks



Clinical Microbiology

General Comments:

AEROBIC BACT. SWAB x 2 on 07-Jun-18
FINAL REPORT 2018-JUN-08

Isolates * prefixes an isolate that has sensitivity results

Specimen	Organism
* SKIN SWAB FACE	LIGHT GROWTH MRSP
	Fusidic acid sensitive. positive for methicillin-resistant staph. pseudintermedius (mrsp) by pbp2' latex agglutination.

Skin swab FACE (panel: **Companion Gram Positive**) Organism: **MRSP**

Sensitive	Intermediate	Resistant
AMIKACIN		AMOX/CLAV.ACID <=0.25
CHLORAMPHENICOL <=8		AMPICILLIN 4
ENROFLOXACIN <=0.25		CEFAZOLIN <=2
MARBOFLOXACIN <=1		CEFOVECIN 2
PRADOFLOXACIN <=0.25		CEFPODOXIME <=2
RIFAMPIN <=1		CEPHALOTHIN <=2
		CLINDAMYCIN >4
		DOXYCYCLINE >0.5
		ERYTHROMYCIN >4
		GENTAMICIN 16
		MINOCYCLINE >2
		PENICILLIN >8
		TETRACYCLINE >1
		TRIMETH/SULFA >4

NEXT STEPS

- Extend food trial
- Continue glucocorticoids
  - Taper over 4-6 weeks
- Start antibiotics (4 weeks)
- Recheck at 4 weeks
  - Much improved & cytology: Negative
    - Stop abx
- Recheck after 8 weeks
  - Off glucocorticoids – pruritus returns

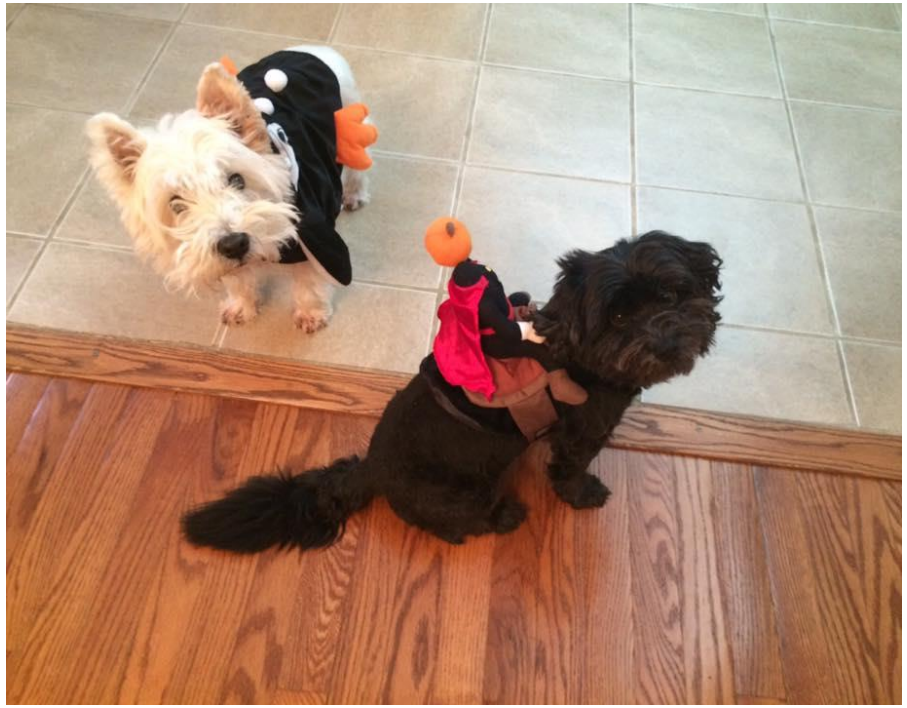
When stable….make one change at a time ☺

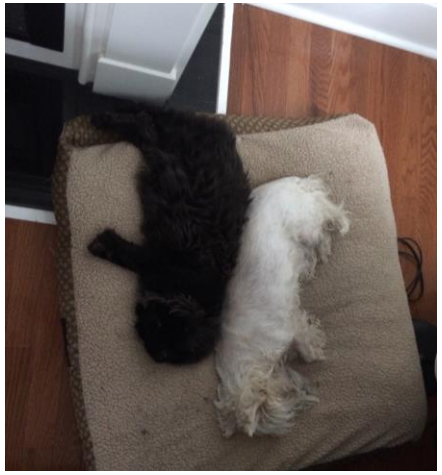
ATOPIC DERMATITIS

- Patient has pruritus and inflammation
  - Otitis and prone to infection
- Allergy Testing
- Medical Management:
  - Atopica ™
    - Pair with GC to begin
  - Glucocorticoids

FOLLOW UP

- After 6 weeks on Atopica ™ – doing very well
- Long term plan:
  - Taper medication to EOD, twice weekly
  - Addition of barrier repair
  - Addition of nutritional management
  - Plan for flare-ups






ALFIE

TAKE HOME MESSAGES FROM THIS CASE

- Atopic dermatitis is a diagnosis of exclusion
- Not all medications work the same way and won't work for every patient
- Select your therapy based on your patient's clinical signs
- Remember to perform a restricted diet trial in all pruritic patients prior to pursuing allergy testing or long term therapy for atopic dermatitis

QUESTIONS??