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Ringworm Outbreak Management

Feline Dermatophytosis
A word about recognizing and treating infectious disease with zoonotic potential in a shelter setting.

- The information in these talks is intended to help shelters work *with veterinarians* to design cost effective systems to screen, treat, and monitor for dermatophyte infections.

- *Please, don’t try to go it alone!*

Outbreak Response Preview

- Identification / Diagnosis of primary agent
- Assessment of capacity to respond
- Assess impact of possible response plans
Outbreak Response Basics

- Evaluation of history and clinical signs (organization level)
- **Clean break**
- Evaluation of clinical signs (individual animal level)
- Risk categorization
- Quarantine / treatment or removal of affected or high risk animals

Dermatophytosis: The Rules

- Pleomorphic presentation
- Many species of dermatophytes – *M. canis* is the most commonly implicated in clinical problems
- Lesions may not be “obvious”
- Wood’s lamp exam highlights fluorescence from *M. canis*
- Fungal culture is the gold standard for diagnosis
Dermatophytosis: The Rules

- DTM (dermatophyte test media) is standard growth media
- Red color change and white (ish) fluffy growth indicates need for micro exam
- Positive id required for diagnosis
- Direct exam of Wood’s positive hairs is like a SNAP test for dermatophytosis
- Healthy, adult cats are difficult to infect in research settings

Case One
What’s wrong with the picture so far?

“Unfortunately we’ve had a few cultures come back +ve. I am sending out those cultures to be ID’ed by a lab, which will take at least 7 days if not longer”

Adding things up

Hello Kitty Microscope!

+ = POS
When considering depopulation...

... many factors including transmission, morbidity, mortality, and public health should be taken into account.

Along with shelter administration, board members and staff/community veterinarians, it is recommended that shelter medicine experts or related professionals be contacted for opinions and advice before making a final decision.

All other avenues should be fully examined and depopulation viewed as a last resort. – Association of Shelter Veterinarians

ringworm outbreak to be investigated by external experts
Evaluation

- In house cultures had growth but microscopic ID revealed various contaminants
- No positive ID from any diagnostic lab
- All animals reported to be Wood’s positive had faintly glowing yellow sebum on the skin
- All cultures and reports of positives from private practice were based on red color change alone and were identified by the diagnostic labs as contaminants
- Reported human cases had no diagnostic testing but were based on history of exposure to the outbreak.
- No evidence of fungal infection was found in any species

Diagnostic results
Results

- Damaging to reputation
- Increased scrutiny
- BUT...
- Increased internal evaluation
- Dramatically improved operations

Case Two

Culture Results
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Go: Initial contact

- Somebody thinks there’s an outbreak
- Who?
- Why?
- Which animals are involved?
- Leads to step one: Collecting history and “clinical signs”
Step One: Initial Evaluation
What has already been done?

- Collecting history and "clinical signs"
- Is disease present?
- Is it an outbreak?
  - Severity of disease
  - Other clinical signs?
- Species / Ages affected
- Numbers affected
- Husbandry PRACTICES
- Reported disease at source

- Individual illness
- Group signs **

Diagnostic Testing?

- What testing has already been done? ie red color?
- Veterinary screening for lesions?
- Wood’s lamp and direct exam of fluorescing hairs?
- Fungal Culture?
- Microscopic identification?
Outbreak Response?

Key Concept:
- Stop the cycle of transmission.

Problems:
- Long diagnostic period
- Ease of transmission
- Clinical signs overlap with many skin conditions
- Environmental Contamination

Transmission

- Highly contagious!
- Undiagnosed is highest risk
- Environment, stress and health

Routes of infection
- Direct
- Fomite
- Environment
- Zoonosis
2-3 week Incubation

Week 0 1 2 3 4 5 6

Exposure / Infection Most common onset of illness

Step Two: Planning

- What needs to be included in the plan:
- “Clean Break”
- Evaluate clinical signs
- Diagnostics!
- Initial Risk Assessment
- Diagnostic results
Step Three: Clean Break

"Clean break"

- New Incoming cats
- Exposed Population
- Separate staff
- Separate equipment
- Both areas treated as isolation

Step Four: Evaluate clinical signs
Clinical Evaluation Overview

"Clean break"

New Incoming cats

Screening

Exposed Population

Screening

Screening Protocol

Screening exam and culture

Lesions?

Direct exam

P

Wood’s Exam

P

Treat as true infection

All

Initial Risk Assessment Based on Lesions +/-

No lesions

Move on

Lesions

Wait for culture results
Direct Exam

As close as we get to a SNAP test for dermatophytosis.

Step Five: Shuffle One
Wood’s Lamp Dance
Initial Risk assessment

- Based on step 4 results
- Remove identified positive animals from general population
- Isolate / Separate suspect animals (lesional)
- Non-lesional, Wood’s negative cats
- Base intervention on clinical assessment
- +/- Dip and Go
- +/- Follow up with culture results
**Step Six: Evaluate Risk**

- How high is the risk?
- Initial results of first clinical assessment
  - Intake practices?
  - Sanitation practices?
  - Co-mingling practices?
  - Level of current disease?
  - Age?

- Not Stray vs. Surrender

**Step Seven: Environmental Sampling**

- Areas where hair and dust collect
- Difficult areas / articles to disinfect
- Pre-cut cloths in zip top bags
- Label each area
- Cloth should appear slightly soiled
- Inoculate as usual
Step Eight: Culture results

Microscopic identification of fungal growth from culture

M. canis

M. gypseum
Response Based on Pathogen Score Results (CFU)

- **Lesions**
  - **NO**
    - Treat as fomite carriers
  - **YES**
    - Treat as true infection

**Results (CFU)**
- 1-9 CFU
- 10 or more CFU

**Culture results include environmental samples**

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</table>
Step Nine: Shuffle again

Remove positives from the general population

Clean like heck!

Can you safely send them somewhere else?

- What is safe?
- Effective treatments
- Include topical treatment
- Away from other pets, children, IC humans
- Easily disinfected area
- Resilient, compliant humans
- No uninformed adopters
- In shelter isolation area
**Step Ten: Long Term Response Plan**

- Eliminate risk factors
- Screen ON INTAKE
  - Visual
  - Wood’s exam
  - Culture inflammatory lesions
- Screen before re-housing
- Protect the kittens
- Isolate or separate suspect or affected cats
- Treat with effective topicals
- Monitor, monitor, monitor
- **Treatment improves volunteer and staff reporting**
Lime sulfur and itraconazole

Published clinical research with shelter animals has:

- Demonstrated rapid times to cure (+/- 14 days) for true infections (P3)
- Demonstrated excellent control of environmental contamination even after the first treatment
- Demonstrated that adverse reactions are very rare (did not occur).
- No other product or combination has yet been shown to have equivalent efficacy.

Treatment

- Lime sulfur topical (8 oz. / gallon) before entering the treatment area
- Oral itraconazole for 21 days
- Lime sulfur topical twice weekly until cure is defined
- Culture weekly just before topical treatment

WITH THIS PROTOCOL:

- Cure is defined as two consecutive negative cultures taken at one week intervals
Defining cure

WITH THIS PROTOCOL:

* Cure is defined as two consecutive negative cultures taken at one week intervals
* Hairloss may not be resolved
* First culture called at 21 days
* Second culture called at 14 days

<table>
<thead>
<tr>
<th>Date</th>
<th>M. canis</th>
<th>Culture 1</th>
<th>Culture 2</th>
<th>Lesions</th>
<th>TNTC</th>
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<td>0</td>
<td>0</td>
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Intake Quarantine?

* 2-3 week requirement!
* Can you really quarantine?
* What if one develops clinical signs?
* **Use excellent monitoring as an alternative!**
* Not usually recommended
* Balance risks and population dynamics
* Consider impact on capacity and crowding
* Consider maintenance of health and emotional well-being
Summary

- Exam screening is a powerful tool for prevention
  - Cheap
  - Fun
  - Easy

- Outbreak response can be devastating and costly.
- BUT...outbreaks can be managed AND ended.
- Lives can be saved IF you use a systematic approach.

Thanks for caring...

THANKS!

Ken: Our first customer
...and thanks to the ASPCA for making my position possible
Thanks for caring...

...and thanks to the ASPCA for making my position possible

THANKS!

Ken: Our first customer

A Few Coming Attractions from ASPCApro

www.aspcapro.org/webinars

• Starting a TNR Program in Your Community (10/17)
• Beating Ringworm: Yes, You Can! (10/23)
• Let’s Talk Fungus! (10/24) new Q&A session
• Canine Assessment: SAFER Overview & Research (11/28)
• Helping Adopted Dogs Adjust to New Homes (12/06)