Disease risk in a pretty typical U.S. shelter


Disease risk at 5 U.K. cat centres

Right here in the U.S. of A.

URI frequency in the shelter ranged from 4.4% to 25%

Why???

How I used to think

What causes feline URI?
- HERPESVIRUS ~ 50%
- CALICIVIRUS
- Chlamyphila felis
- Bordetella
- Mycoplasma
What causes feline URI?

- Herpesvirus causes vast majority of “endemic” shelter URI
- Calicivirus and Bordetella are sporadic problems
- Chlamydia is rare but problematic when it occurs
- Mycoplasma is common and important secondary player

Herpesvirus versus calicivirus:

- Airborne transmission?
- Fomite transmission?
- Carrier state?
- Stress associated?
- Vaccine resistant?
- Consistent biotype?
- Corneal ulcers?
- Oral ulcers?
- Limping?
- Virulent systemic disease?
- No signs at all?
Herpesvirus re-activation

- STRESS
- Pregnancy/birthing
- Moving from cage to cage
- Housing change induced shedding in 18 - 83%
- Introduction of new cats – especially intact
- Infection activated in cats negative after 2 steroid treatments


FAQ: When this cat is clinically recovered, will she be a particular risk to others?

No!!

What about this one?
The answer depends on the signs in these cats

Calicivirus risk assessment

- Evaluate risk posed by individual based on disease manifestations in group:
  - Severity of worst disease
  - Health, age and vaccine status of affected individuals
  - Presence or absence of co-factors
  - Apparent ease of spread
- Risk likely reduces over time and with full resolution of signs
- Highest risk if healthy adults from clean environment are affected


<table>
<thead>
<tr>
<th></th>
<th># of cats</th>
<th>Chlamydia</th>
<th>Herpes</th>
<th>Bartonella</th>
<th>Mycoplasma</th>
<th>C. felis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well</td>
<td>259</td>
<td>71 (27%)</td>
<td>42 (16%)</td>
<td>30 (12%)</td>
<td>15 (6%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>URI</td>
<td>12</td>
<td>39 (33%)</td>
<td>95 (80%)</td>
<td>25 (20%)</td>
<td>65 (53%)</td>
<td>14 (4%)</td>
</tr>
<tr>
<td>Odds ratio</td>
<td>1.6 (95%)</td>
<td>2.18 (1.4-3.2)</td>
<td>94 (61.2%)</td>
<td>4.26 (2.4-7.7)</td>
<td>12.02 (1.6-92)</td>
<td></td>
</tr>
</tbody>
</table>
The number one rule out for sudden death in shelter cats?

Diagnosis of URI – why bother?

- Unusually severe or frequent disease in population
- Suspected Chlamydia or rule out others in individual
- At least 5-10 acutely affected animals
- Most affected location or per laboratory instructions
- Quantitative RT-PCR may help distinguish important versus vaccine/carrier in future

Treatment

a.k.a. the least effective, but still important, tool for control of feline URI
**Bacterial infection in URI**

- Pasteurella species, E coli, Streptococcus, Enterobacter and Staphylococcus species
  - Gram negative and gram positive
- Mycoplasma very common
  - No cell wall
- Chlamydia and Bordetella sporadically important
  - Intracellular
- Revisit stress management, crowd control, air quality as first defense


**General treatment guidelines**

- Antibiotics only when clearly indicated
  - Including if always indicated
  - Not including if not always indicated
- Consistent 1, 2 plan based on categories of signs/severity
  - Mycoplasma/Chlamydia/Bordetella vs. secondary
- Evaluate early and often in shelter, treat to either cure or failure rather than time

**Practical considerations:**

- Cost, route, frequency, side effects
- Less ideal given correctly is better than ideal given wrong
- Above all, do no harm
  - One cat, one set of drugs
  - Doxy: liquid or flush, milk products ok, citric acid can cause toxic byproducts, 7 day max

DOXYCYCLINE POTENCY AFTER STORAGE IN A COMPOUNDED FORMULATION FOR ANIMALS. Mark G. Popoff, Daria DiGiovanni, and Gigi Davidson, North Carolina State University, College of Veterinary Medicine, Raleigh, North Carolina, USA.
Chlamydia treatment scheme

- Suspicious clinical signs
- Responds to doxycycline, clavamox, fluorquinolone, azithromycin, topical tetracycline within 7 days
- Signs recur within 14-30 days
- Responds again to doxycycline
- Continue 4 weeks minimum
- Put up for adoption on treatment once signs resolve
- Good foster to adopt candidates

Remember Chlamydia is uncommon: consider PCR before second round of treatment

Consistent plan

[Diagram]


The importance of medical records!

- Multiple cats and observers means written record extra important
- Daily observation of signs
- Written dose, duration, route as usual
- Initials of person giving drug

http://www.sheltermedicine.com/node/307
Knocking the Snot Out of Feline URI: Saving Shelter Cats' Lives with Treatment and Prevention

Don't forget supportive care as needed

- Delicious, stinky food
- Fluids
- Pain control
  - Especially if ulcers
- Humidification/nebulization
- Appetite stimulants
- Nose drops EONatri/EOD
  - Try saline drops first
- Fever reducer
- Balance with stress

Room for recovery

Private Room: Not having a roommate slashes the risk of airborne infection. A seven-year study showed that nursing home residents in private rooms were three times less likely to catch the flu. Single occupancy means better rest, too. Canadian researchers reported that ICU patients bunking solo got 1.3 more hours of sleep.

Counseling: Research also shows that visitors who provide valuable social support and physical assistance tend to stay about eight minutes longer on average when rooms are carpeted.

A View of Nature: Research published in the journal Science compared postsurgical patients who had a view of trees with those who had a view of a brick wall. The nature gazers needed fewer pain meds, suffered fewer minor complications (such as fever, nausea, and constipation), and stayed on average of .74 fewer days at the hospital.

Sound-Absorbing Ceiling Tiles: Swedish researchers who installed high-density fiberglass tiles in an ICU discovered that they lowered noise levels slightly. As a result, patients had more restful sleep, and a lower rate of rehospitalization.

Light-Filled Windows: At a Pittsburgh hospital, post-op patients who recovered in sunny rooms took 22 percent less pain medication per hour than patients in dim rooms. Another study found that in cardiac ICUs, the death rate was about 60 percent higher in facilities that lack natural light.

http://www.oprah.com/health/Hospital-Room-Design-Better-Hospitals-Hospital-Room-Recovery_1
Knocking the Snot Out of Feline URI: Saving Shelter Cats' Lives 
with Treatment and Prevention

Treatment area guidelines

• Natural light, good air quality, big comfy cages, hiding spots or half-cage-covers, minimal noise
  • No dogs allowed!
• Dedicated equipment, protective tops, gloves or hand wash before and after handling cat
• Forget about footbaths
  • Shoe covers if something truly awful going on
• Play/lap sitting area ok
  • ideally off to the side
  • Do not use for suspect calici
  • Shut down if unusually severe disease

Chronic or nonresponsive “URI”

• Population?
  • Isolation/treatment conditions?
  • Flow through issue from isolation to adoption?
  • Unusual pathogen?
• Individual?
  • Stress, poor immune function plus the usual?
  • Chlamydia, polyp, fungal, deep bacterial plus structural compromise?
  • Lymphoplasmacytic rhinitis, neoplasia, dental issues, foreign body?

Chronic or nonresponsive URI

• Initiate after two rounds of appropriate (different) antibiotic tx
  • Chlamydophila
  • Gram negative
• Careful physical exam
  • Nasal versus ocular versus both
  • Unilateral versus bilateral
  • Retrovirus testing
**Additional basic diagnostics for chronic URI**

- Polyp check
- Aerobic bacterial culture
- PCR panel (Chlamydia, Mycoplasma)
- Biopsy?
- Nasal flush

**Chronic or nonresponsive URI treatment**

- Antibiotics with good penetration
  - Doxy, clindamycin, clavamox, azithromycin
  - If antibiotic response, continue 8 WEEKS
- Humidification/nebulization
- Outdoor access
- Foster or adopt: unlikely risk to pet cats
- Do not keep in limbo in isolation!

**Now let's get back to the fun stuff**

*How do we prevent this?*
What causes feline URI?

- Ineffective vaccination?
- Improper disinfection?
- Poor nutrition?
- Lousy air quality?
- No place to hide?

Vaccination basics

- Mitigates severity but does not prevent infection; takes time to protect
- FVRCP for all > 4-6 weeks on entry + 2-3 week booster
  - 2 weeks before entry if possible
- Revaccinate kittens SC every 2 weeks while in high risk environment, every 3-4 when not
- Final vaccine at 20 weeks in whatever environment
- Mixed reviews on the IN vaccine
  - In the face of an outbreak?
  - For kittens in addition to SC?
- 2 way calici vaccine for adult long stay shelter cats/pets in foster homes
- Revaccinate high risk adults annually especially after hiatus from exposure

Disinfection basics

- Calicivirus
  - Bleach and its ilk, potassium peroxymonosulfate, accelerated hydrogen peroxide
  - NOT: quats, chlorhexidine
- Stress, fomite transmission and respiratory irritation can cause more harm than good
- Daily housing during residence, focus on high contact surfaces
- Taps stay with populations, cleaned after sick cat contact and before well cat contact
- Sometimes compromise on sterility is worth a decrease in stress
  - E.g. paper-towels, paper, staff's housing versus stainless steel
  - New intake versus long term, kittens versus adults
**Nutrition basics**

- Offer palatable, highly absorbable, consistent diet
- Have variety on hand for picky eaters
- Separate food and litter by at least three feet
- Dim lights and/or cover cage
- Avoid pairing feeding with aversive activities
  - Smells, sounds, disruption

  e.g. www.crijopets.com

**Speaking of nutrition...**

- Two recent studies conducted in animal shelters showed no benefit of lysine supplementation for preventing URI (1,2)
- Two studies have documented more severe URI in supplemented cats (2,3)

**Lysine references for the curious amongst you**


Air quality basics

✓ Droplet spread possible up to five feet
✓ At least 1.5 open cage/condo sides if possible
   • More important the smaller the cage
✓ Minimize irritants
✓ Spot clean, no spray
✓ Use fans after cleaning
✓ Open doors and windows
✓ Utilize outdoor space whenever possible
✓ Don’t hang your hopes on air filters

Hiding place basics

• Shelf may be preferable to box if floor space is limited
• Box maybe preferable to shelf is height is limited but floor space adequate
• Partial front cover and towel in cage may be best choice if both floor space and height are limited
• Tailor to individual cat in small small cages


What if you tried all this and you’re still looking for answers?

[Image of search results]
I work at a non-profit, open admissions shelter... In the past, the summer months have brought us rampant URI in cats, and our live release rates have been less than ideal (2010 was 54% for the month of July). We have an amazing new building that opened in 2009, and has 126 Shoreline cages for cat holding (in addition to the adoption floor, which has two “kitty cities” for group housing and 16 cat “condo’s” that are basically tiny rooms instead of cages).

In 2010 we adjusted the temperatures in the cat lofts higher so the kittens wouldn’t be as cold, we added hiding boxes and Kuranda beds, but we didn’t see any changes in the URI rates. Cats were being euthanized daily because the URI was so widespread, and the severity of the illnesses were much greater than you see in private practice URI. Cats would go to foster for URI and be there for MONTHS with sneezing or conjunctivitis.

Hmm…now what?

Environmental and Group Health Risk Factors for Feline Respiratory Disease in Animal Shelters

49 questions including cage size, material and number, hiding place, handling, infectious disease control, vaccination, feeding, timing of S/N, air quality, natural light, dog exposure
Knocking the Snot Out of Feline URI: Saving Shelter Cats' Lives
with Treatment and Prevention

9/27/2012

After all that, what mattered most?

<table>
<thead>
<tr>
<th>Shelter</th>
<th>Total Feline Intake</th>
<th>Total Shelter Days</th>
<th>Total Number of URI Cases</th>
<th>URI Prevalence (in % of cases)</th>
<th>Annual URI Rate</th>
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<td>9</td>
<td>2714</td>
<td>2620</td>
<td>475</td>
<td>17.4%</td>
<td>39.87</td>
</tr>
</tbody>
</table>

Greater than 9 square feet of floor space but not 6-8 compared to < 6
Limited movement in first 7 days
All large cages were compartmentalized

Big differences

- ~ 50 fold variation between shelters on per day basis
- ~ 8 fold variation as percentage of intake
- 50,531 total sick cat days
- 13% of care days overall, range < 1% to ~30%

Stay tuned!

Fixing the Feline Housing Crisis: How Shelter Housing Can Make Cats Sick - And What You Can Do About It

Cats are extremely sensitive to noise, crowding, and stress—three things that are in abundant supply in many animal shelters. These adverse conditions often lead to illness in shelter cats, particularly the common colds of feline shelter disease, upper respiratory infection (URI).

The good news is that by decreasing crowding and reducing stress, you can drastically cut the incidence of feline URI in your shelter's population.

Related Links:
- UC Davis V-KIT program
- Guidelines for standards of care and animal welfare
- Fixing the URI Out of Feline URI to make Cats Sick - And What You Can Do About it

Register for the free webinar here:

http://www.maddiesfund.org/Resource_Library/Fixing_the_Feline_Housing_Crisis.html
• In February 2011, we took a huge step and cut holes in between cat holding cages, and inserted PVC portholes, effectively doubling the space available to each cat and cutting the number of cages we had in half. Actually less than half - because each loft had an odd number of cages, there is a set of triple cages in each loft. We’ve now got 60 separate cat holding cages. These portholes were designed to be permanent openings, we did not make any “doors” to close because then it’s too tempting to revert to less space and more cats. We had many staff and volunteers who were very leery of the change, fearing that more cats would be euthanized because we lacked space.

• We saw some effects right away. The lofts were immediately quieter, cats seeming more relaxed. There were very few cats “fake sleeping”. The longer term effects are just starting to show up. Cat isolation is empty today, because our URI rates have plummeted. Cats aren’t breaking with URI right before or after adoption. And now that the statistics for July are in, we found that our live release rate for felines in July 2011 was 70%. In 2010 it was 54%. We euthanized 140 fewer felines in July 2011 compared to July 2010 - and those numbers include the cats we euthanize on intake for lack of space.
Still not perfect

- We still have to remind ourselves occasionally that we don’t have enough homes to save every cat we otherwise could right now. But making the euthanasia decision earlier on is saving a lot of staff time and stress, and in the long run we’ve got healthier cats to adopt. Healthier cats will make a difference in the reputation we have, and pave the road to even higher adoption numbers.

Positive outcomes for “unadoptables” can improve health of “adoptables”

"Sometimes we just have to laugh because it almost seems impossible that one program can impact the numbers so significantly. This was one of those areas of the operation that we didn’t even know would improve until after we started the program and realized what a positive impact it was having on the incidence of URI and our capacity to handle URI."
Research on “Environmental Risk Factors for Feline URI” and “Comparison of Two Cage Types: Effect on Shelter Cat Stress, Upper Respiratory Disease and Adoption” was funded by Morris Animal Foundation—the world’s largest nonprofit that supports animal health studies to protect, treat and cure animals.

Morris Animal Foundation funds research at veterinary colleges around the world. Its funding facilitates medical breakthroughs that help animals enjoy longer, healthier lives and trains the next generation of veterinary scientists.
Knocking the Snot Out of Feline URI:  Saving Shelter Cats' Lives with Treatment and Prevention

URL details

http://www.sheltermedicine.com/node/45

Got ???

Please take our survey:

https://www.surveymonkey.com/s/VGBH2C7
Additional Notes: