Saving lives through sanitation

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WHY do we CLEAN?

“The clean queen”

• ?
• ?
• ?
• ?
• ?
The art and science of sanitation

“The clean queen”

• Reduce dose
• Reduce respiratory irritants
• Improve public image
• Protect human and animal health
Key Concepts

• **Carrier:** An animal which is infected but not currently showing signs of disease
  – Latent versus active
  – Pre-clinical, recovered, chronic
Key Concepts

- **Dose effect:** the amount of infectious material required to make an animal sick

- Depends on virulence of agent (bacteria, virus, etc.) and immune status of intended victim
Modes of transmission

- Direct contact
- Droplet (4-5 feet)
- Airborne
  - Uncommon
- Vector
- Fomites
Modes of transmission

• Respiratory secretions
• Saliva
• Feces
• Fur
• Urine
• Blood
• Abortion/birth fluids
• Specific tissue
Cat scratch fever
Tapeworms
Heartworms
Many tick borne

Ringworm
Calicivirus!
Anything in saliva or feces

URI
Calicivirus
Herpesvirus
Kennel cough
Distemper
Salmonella
Parvo/panleuk
FeLV

FIV
Rabies (nerve tissue)

Parvo/panleuk
Distemper
Calicivirus
Coronavirus
Salmonella
Assorted worms
Many, many more

FIV
Rabies
Cat scratch fever
Abscesses

Distemper (urine)
Calicivirus (urine)
Leptospirosis (urine and birth fluids)
Q fever (birth fluids)
Brucellosis (birth fluids)
Modes of transmission
Components of a plan

• What to clean
• How to clean
• What products to use:
  – Detergent
  – Disinfectant
  – Degreaser
• Implementation and follow through
Basic principles of cleaning

- Cleaning versus killing
  - Soap/detergent cleans
  - Disinfectant kills
  - Degreaser for serious cleaning
  - Deodorizer just de-odorizes
Basic principles of cleaning

• *First*, clean as much as possible
• *Then*, kill what you can’t clean
• *Prevent* what you can’t clean or kill
• Easier is better
• Bad is worse than nothing
Mechanical cleaning

- Scrubbing
- Detergent
- Rinsing
- Periodic degreasing
Is this your shelter?
Clean-able environment

- Stainless steel
- Sealed concrete
- Plastic?
- Carpet?
- Furniture?
- Grass?
Clean-able environment

• Stainless steel
• Sealed concrete
• Plastic?
• Carpet?
• Furniture?
• Grass?
What needs cleaning?

- ?
- ?
- ?
- ?
- ?
- ?
- ?
- ?
What needs cleaning?

• Cages, obviously
• Exam surfaces
• Carriers
• Dishes
• Litter pans
• Bedding
• Toys
• Vehicles
• Common areas
• Door knobs, telephones
• Etc. etc. etc…
Nooks and crannies
Choosing a disinfectant

- Toxicity
- Spectrum of effect
- Organic matter issues
- Contact time
- Detergent activity
- Mix-ability
- Stability
- Cost
- None are perfect!
Un-enveloped viruses

- Parvovirus and panleukopenia
- Feline calicivirus (feline URI)
- Adenovirus (canine hepatitis, kennel cough)
Bleach

- Unenveloped viruses
- Ringworm at higher concentration
- Low toxicity
- Cheap
- 5% bleach at ½ cup per gallon for routine use
Bleach

- Inactivation by organic matter
- Inactivation by light
- Relatively unstable
- Less effective at high PH
- Fumes can be irritating
- Corrosive
- No detergent activity
Quaternary ammonium

- E.g. Roccal®, Maxxon®, Parvosol®
- a.k.a didecyl dimethyl ammonium chloride, N-alkyl dimethyl benzyl ammonium chloride, octyl decyl dimethyl ammonium chloride, dioctyl dimethyl ammonium chloride...
Quaternary ammonium

- Some detergent activity
- Moderate inactivation by organic matter
- Low tissue toxicity
- Non-corrosive
- Inexpensive
Quaternary ammonium

• 1980, 1995, 2002 studies: ineffective against unenveloped viruses, despite claims to the contrary

• Inactivated by soaps or detergents
Chlorhexidine (Nolvasan®)

• Gentle on tissue 😊
• Gentle on germs 😞
• Relatively expensive
• Ineffective against unenveloped viruses, ringworm
Potassium peroxymonosulfate
(a.k.a. Trifectant, Virkon)

- Un-enveloped viruses
- Some detergent activity
- Low inactivation by organic matter
- Low toxicity
- Less corrosive than bleach
- Inexpensive
Potassium peroxymonosulfate

- Ringworm claims not upheld
- Available only as powder
- Stable only ~ 7 days
- May leave residue
  - Residue may help!
Phenols?

- Irritating to skin and respiratory tract
- Toxic to cats
- Effective, but do not use around animals
- Label CLEARLY if you’re going to have them around
Alcohol hand sanitizer

- 70% ethanol most effective
- Adequate contact time required
- Does not kill parvo, panleukopenia or ringworm
- Wash hands with soap and water when it really counts
In order of difficulty:

- Canine distemper
- Feline herpesvirus
- Bordetella bronchiseptica
- Feline calicivirus
- Parvo
- Panleukopenia
  - (feline distemper)
- Ringworm
Agents not killed by any routinely used disinfectant at normal concentration!

- Ringworm
- Many internal parasite eggs, i.e. roundworm, whipworm
- Protozoal and coccidial cysts (Toxoplasma, cryptosporidium, coccidial diarrhea in puppies and kittens)
- External parasites i.e. fleas, scabies, cheyletiella
- Clostridium and Bacillus spores
Thoughts on mopping

- Labor intensive
- Spreads disease if not used carefully
- Only choice in some areas
- For Virkon-S or Trifectant application
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- Labor intensive
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If you must mop…

- Double sided bucket
- One side to load, one to rinse
- Different buckets for different areas
- Mark fill line, provide measuring cups, post correct dilution
If you must mop...

- Double sided bucket
- One side to load, one to rinse
- Different equipment for different areas
- Mark fill line, provide measuring cups, post correct dilution
Thoughts on sweeping

- Can aerosolize germs with litter and hair
- Minimize sweeping around animals
- Use swiffers or damp mop if possible
- Allow time for settling
Spray bottle

- Respiratory irritant
- Use with paper towels or single use rags
- Mark and measure disinfectant
- Light-proof containers for bleach
- Make fresh routinely
Squirt bottle

- Alternative to spray bottles
- Use paper towels or single use rags to apply
- Less respiratory irritation than spray bottles
- Nicer for staff and cats
Rags n’ buckets

• Less irritating
• Single use rags or paper towels
• Double sided buckets
  – One for rags
  – One for disinfectant
  – Nice for dunking scrub brushes too
• Make fresh daily
Hose-end sprayer

- Easier, faster, more effective
- Better coverage
- Correct dilution
  - Ensures efficacy
  - Minimizes cost

- http://www.animal-care.com/
- www.animalhealthtechnology.com
Built in mixing stations

- Most efficient
- Check with colleagues before installing
- Not compatible with every product, but...
- Less effective product applied correctly will work better than the most effective product applied poorly
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Dish washing

- Commercial high heat dishwasher preferred
- If hand washing, WASH before disinfecting
- Separate dishes from litter pans
- Use stainless or disposable if at all possible
Laundry

- Hot water
- Bleach
- Dryer
- Do not overload
Hand washing

*The single most important means of preventing disease transmission!*
Not *only* hands
Cleaning in the real world

- Everyone move down one
- Saves space – only requires one empty kennel per bank
- Each animal only exposed to those on either side
- Inadequate contact time
Cleaning in the real world

- One carrier per cat
- To go home with adopter
- Practical where high % of cats are adopted
- Permits hosing
- Requires storage space
Cleaning in the real world

- Carrier in cage
- Minimizes handling
- Time saver
- Doubles as a cozy hiding space
Cleaning in the real world

- Movable cages
- Cat stays in same cage throughout stay
- After cat leaves, cage is rolled outside and thoroughly cleaned
Cleaning in the real world

- Minimal interference
- Tidy cage daily
- Change litter frequently
- Clean thoroughly between occupants
Cleaning in the real world

• Double sides cat cages
• Reduces stress and increases adoptable behavior
• Allows care with minimal disruption
• Resist temptation to overcrowd!
Above all, do no harm

- Minimize moves
- One carrier per cat
- Separate supplies for separate areas
- Separate dirty and clean workers or activities
- Change after cleaning
Do no harm

Remove sick animals *before* cleaning
Do no harm
Do no harm

Cage cleaning is not the time and place for kitty exercise
Change after cleaning!

www.glogerm.com
Sanitation summary

- Plan for mechanical cleaning
- Whatever disinfectant is used, periodically degrease, high heat steam clean, bleach
- Make fresh batches regularly
- Use adequate contact time
- Prevent contamination of un-cleanable areas
- Plan animal flow and segregation to prevent disease spread
Implementation

• Whatever you decide to do…
• Write it down!
• Train staff and volunteers
• Check periodically
• Help your colleagues stay sharp
Cleaning and crowding case study

- 94 cages
- Cats move from cage to cage
- URI cats treated with antibiotics
- Mildly ill cats for adoption
- Minimal adopter supervision
Case study

• Salmonella outbreak January 2004
• Cages reduced to 66 (36% reduction)
• Stay in same cage
• Sick cats immediately removed
• Supervised cattery – mandatory gloves

What will happen to euthanasia and adoption?
## Results

<table>
<thead>
<tr>
<th></th>
<th>Cats handled</th>
<th>Cats adopted</th>
<th>Cats redeemed</th>
<th>Cats euthanized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-outbreak</td>
<td>4872</td>
<td>1871 (38%)</td>
<td>108 (2%)</td>
<td>1329 (27%)</td>
</tr>
<tr>
<td>Post-outbreak</td>
<td>4708</td>
<td>1965 (41%)</td>
<td>103 (2%)</td>
<td>1223 (26%)</td>
</tr>
</tbody>
</table>
Would you like to learn more?

- www.sheltermedicine.com
- Animal Sheltering Magazine July 2003
- Greene’s Infectious Diseases of the Dog and Cat
- Shelter Medicine for Veterinarians and Staff
- Seymour Block: Disinfection, Sterilization and Preservation
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- Seymour Block: Disinfection, Sterilization and Preservation
The End

Thanks, PetSmart Charities and UC Davis CCAH and most importantly all of you 😊
To receive a copy of the slide presentation, please send an email to:

rmason@ssg.petsmart.com

Link to Disinfection article in Animal Sheltering Magazine:

http://www.hsus2.org/sheltering/magazine/currentissue/jul_aug03/jul_aug03.html