APPENDIX V:

CLEANING PROTOCOLS FOR PUBLIC ANIMAL SHELTERS

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General cleaning considerations for shelters

Introduction

Cleaning and disinfection are not trivial concerns in shelters. Careful and effective cleaning by well trained employees is literally life saving. Although the main purpose of cleaning animal areas is prevention of infectious disease spread, an additional benefit is increased willingness of the public to adopt from and support a shelter that looks and smells clean. Because of its importance for animal health, cleaning should be approached systematically, and a well thought out plan developed, implemented and periodically revisited to make sure it is still functional. Time and money spent on training and supplies for an effective cleaning program will be amply repaid in decreased costs due to disease.

What needs to be cleaned?

When we think of cleaning protocols, often the focus is on cleaning cat cages and dog runs. However, germs are tracked by human and animal traffic *throughout* any shelter. Additionally, germs are spread by hands, on doorknobs, clothing, carriers, exam tables, instruments, animal transport vehicles, and so on. Different protocols and products may be needed for different areas; following is a list of some areas and items to consider:

- Office areas (lower priority if shelter animals are not allowed in offices, but employees will still track germs in and out from animal areas).
- Main lobbies and hallways.
- Dog runs, including central walkways, walls, doors, gates, etc.
- Cat rooms, including floors, walls, doorknobs, etc. as well as cages (if applicable).
- Quarantine areas.
- Isolation areas.
- Medical/surgical areas, including instruments and equipment.
- Other indoor animal areas, such as grooming, treatment rooms, intake rooms, visiting rooms, training areas, etc.
- Exercise yards or other outside animal areas.

- Vehicles.
- Carriers and transport cages.
- Hand washing.
- Employee clothing (separate clothing should be worn while doing heavy cleaning or handling infectious animals).
- Bedding.
- Dishes.
- Toys.
- Tools, such as poop scoopers and mops.
- Ventilation and heating ducts.
- Storage areas (especially food storage).
- Entire building, especially door knobs, phones, keyboards, and other frequently handled items.

If no specific guidelines exist, it's likely that cleaning some of the above listed areas will be overlooked in a busy shelter. Therefore, for each of the areas/objects to be cleaned, at least a brief outline should be written detailing:

- How often the area/object is to be cleaned (after each use, daily, weekly, annually?)
- Who is responsible for cleaning (and who will double check and make sure it has been cleaned adequately).
- What cleaning and disinfection products are to be used.

In some cases, it may make sense to have one basic daily or more frequent protocol, with a more thorough cleaning protocol used at less frequent intervals (e.g. once a week.

Cleaning order

Who gets cleaned first?

To avoid dragging disease from sick to healthy animals, cleaning should proceed from the cleanest areas of the building housing the most vulnerable animals to the most contaminated areas and the least vulnerable animals. A good general order would be:

1. Adoptable kittens/puppies
2. Adoptable adult animals

3. Stray/Quarantine kittens/puppies
4. Stray/Quarantine adult animals
5. Isolation areas

Other animals that are likely to be healthy but may have compromised immune systems, such as those recovering from spay/neuter surgery or being treated for other non-infectious conditions, should also be cleaned relatively early in the cycle.

Separate brushes, mops and other supplies should be provided for each of these area

What cleaning products should be used?

A clear understanding of the definition and function of different cleaning products is important to design an effective cleaning protocol. Three types of product are generally used for environmental cleaning:

- **Soap/detergent**: Cleaning agent which works by suspending dirt and grease. Does **not** kill harmful microorganisms.
- **Disinfectant:** Chemical agent which kills harmful microorganisms. Does **not** necessarily remove dirt or grease.
- **Degreaser:** More powerful soap/detergent specially formulated to penetrate layers of dried on body oils and other greasy debris.

Effective sanitation requires applying a germicidal agent to a basically clean surface. This requires use of both detergent and disinfectant products. Detergents in themselves do nothing to kill germs. Although some disinfectants can also act as detergents, many (such as bleach) do not. Virtually all disinfectants used in shelters are inactivated by organic material (such as feces, kitty litter, saliva, sneeze marks and plain old dirt) to some extent, so if they are not applied to a clean surface, they simply will not work. Periodically, a stronger degreaser should be used to deal with body oils and other grunge that builds up in kennels over time and can render disinfectants ineffective.

Common disinfectants used in animal shelters

Quaternary ammonium compounds, i.e. Roccal, Parvo-sol, Triple-two, Kennel-sol

- Effective against most bacteria and some viruses.
- **Not reliably effective against parvo, panleukopenia or ringworm**. Ineffective to only partially effective against calicivirus (common cause of feline URI).
- 1980, 1995, and 2002 studies tested quaternary ammonium compounds labeled for use against unenveloped viruses such as parvo and found them less effective than the label claimed.*
- Moderately inactivated by organic debris (but less so than bleach).

- Hard water reduces effectiveness.
- Should not be mixed with other soaps and detergents, as they may cancel each other's actions.
- Low tissue toxicity

Some quaternary ammonium compounds have detergent/cleaning action as well as acting as disinfectants, and are suitable as a good general purpose product for both cleaning and disinfection (a stronger degreaser should still be used periodically), keeping in mind that control of unenveloped viruses require the addition of other products. In general, products used at a higher concentration (ie diluted 1:64 versus 1:256) are likely to have more effectiveness as a detergent. Specifics should be discussed with the manufacturer. A reasonable choice would be to use a quaternary ammonium compound with detergent characteristics for general cleaning of all areas, followed by an application of bleach where unenveloped viruses are a concern (ALWAYS in cat areas since feline calicivirus is so common, in dog areas whenever parvo is a concern, for example in isolation and quarantine; follow cleaning with bleach disinfection at least once a week in all areas even if parvo is not suspected).

References:
Scott FW. Virucidal disinfectants and feline viruses. *Am J Vet Res* 1980;41:410-4
Kennedy MA, Mellon VS, Caldwell G, et al. Virucidal efficacy of the newer quaternary ammonium compounds. *Journal of the American Animal Hospital Association* 1995;31:254-8.
Eleraky NZ, Potgieter LN, Kennedy MA. Virucidal efficacy of four new disinfectants. *J Am Anim Hosp Assoc* 2002;38:23

Bleach (Sodium hypochlorite)

- Member of halogen family of disinfectants, which also includes iodine and related products.
- 5% solution diluted at 1:32 (1/2 cup per gallon) completely inactivates parvo, panleukopenia and calicivirus **when used correctly.**
- Inactivates ringworm at higher concentrations and with repeated application.
- Significantly inactivated by organic matter, light and extended storage: should be stored for limited time in light-proof containers.
- Low tissue toxicity, but fumes can be irritating at high concentration and bleach is corrosive to metal.
- Hard water reduces effectiveness

Bleach has **no detergent action**, and can not be used as the sole cleaning agent in a shelter. Disinfection with bleach requires prior cleaning of the surface with a detergent.

Potassium peroxymonosulfate (Marketed as Virkon or Trifectant.)

- Relatively new product.
- According to 2002 study (Eleraky et al.), effective against panleukopenia and feline calicivirus. Studies also support efficacy against other unenveloped viral agents, including parvo. Labeled as effective against ringworm.
- Reportedly less corrosive to metal than bleach, moderate activity in the presence of organic matter.
- Comes in powdered form, mixed solution stable up to 7 days.

Like quaternary ammonium compounds, potassium peroxymonosulfate reportedly has some detergent effect and can be used as a sole cleaning/disinfection agent for lightly soiled surfaces.

Alcohol (usually in hand sanitizer)

- Effectiveness similar to quaternary ammonium.
- Commonly used in hand sanitizers, not used as an environmental cleaner.
- Less irritating to tissue than quaternary ammonium or bleach.
- Ethanol at 70% concentration is more effective than other alcohols against calicivirus.
- No effect on parvo, panleukopenia, ringworm. Gloves should be worn whenever these diseases are suspected.
- Adequate contact time required (15-30 seconds recommended by manufacturer. Try it – 30 seconds is a long time!).
- Hand washing with soap and water is preferable when possible.

Chlorhexidine (Nolvasan)

- Very gentle, with low toxicity, but not very powerful.
- Relatively expensive.
- Ineffective against unenveloped viruses, including calicivirus. Should not be used as a general purpose cleaning agent.

Phenolic disinfectants, such as **Lysol**, are toxic to cats and should not be used in a shelter. **Gluteraldehyde** and **formaldehyde** are highly effective but also too toxic for routine environmental cleaning

Choosing disinfection products

- Disinfectants MUST be used at the **correct concentration**. Going by smell or color or "eyeballing" it leads to extra expense and potential toxicity if too much is used, and ineffectiveness if too little is used. Cleaning protocols need to include clear instructions on how to correctly dilute the disinfectant to be used.

- Adequate **contact time** is required. Virtually all disinfectants require a contact time of at least ten minutes. Spraying on, wiping off and immediately putting an animal in the freshly "cleaned" cage will not prevent disease spread.

- Disinfectants must be applied to a basically **clean, non-porous surface,** free of organic matter. Porous surfaces such as wood, carpeting, unsealed concrete and turf can't be completely disinfected.

- Disinfectants and detergents can cancel each other's actions, and **should not be mixed** unless specifically directed by the manufacture.

There is no single perfect disinfectant for use in all circumstances. It is important to consider the surface to be cleaned and the harmful microorganisms most likely to be present. Most disinfectants are effective against most bacteria, enveloped viruses and fungi. Unenveloped viruses are more resistant, and are only killed by a few disinfectants safe enough for routine use. Unenveloped viruses of importance in shelters include parvo, feline panleukopenia, and calicivirus (a significant component of feline URI). Other agents not reliably inactivated by most disinfectants include ringworm, some protozoal and coccidial cysts, parasite eggs such as roundworm and whipworm, and external parasites such as fleas, ticks and mites. Special protocols are required when these agents are an ongoing problem in a shelter. Other considerations in choice of cleaning/disinfection agents include cost, ease of storage and application, and animal and staff tolerance. In some cases, it may make sense to have one basic daily or more frequent protocol, with a more thorough cleaning protocol used at less frequent intervals (e.g. once a week.)

Methods of application

Whatever disinfectant/detergent combination is selected, it is important that storage, dilution and application be straightforward and that all needed equipment be provided and in good working order. Improved compliance and reduced cleaning time may repay an investment in a slightly more expensive cleaning system designed especially for shelter use. Buying components such as disinfectant, applicators and mixing systems separately can also result in a functional system but may require a more active effort to put together.

Mopping versus Spraying

***Mopping*:**

Mopping or wiping on disinfectant using a rag or paper towel is generally less efficient than spraying, but may be the only practical option in some circumstances, such as in rooms without drains or where the animal stays in the cage while it is cleaned. Mopping does have the advantage of reduced aerosolization of disinfectant and moisture compared with spraying. In addition to being more time consuming, a potentially MAJOR

disadvantage of mopping (or use of a bucket and rags or brush for cat cages) is the potential for the cleaning solution to get heavily contaminated by organic matter over the course of cleaning a number of cages/runs or a large floor surface, rendering the disinfectant ineffective and spreading disease through the contaminated water. This can be addressed with a two bucket system, by rinsing the mop or other applicator in a clear water bucket between each application of disinfectant. Two sided buckets are available from janitorial supply houses. Another solution, particularly when cleaning cat cages, is to use a separate rag for each cage. Even so, buckets of disinfectant should be emptied, rinsed and refilled between cleaning each ward or area.

***Spraying*:**

Spraying as a method of application offers the advantage that disinfectant does not get contaminated by organic material as it would in a mop bucket. It also tends to be faster than mop bucket application, and commercial sprayers can be set to automatically supply the correct dilution. Hose-end or high-pressure sprayers coat the area to be cleaned more effectively than hand-held spray bottles, and should be used whenever practical. A wide array of cleaning systems appropriate for shelters of various sizes are available through animal care and janitorial supply houses, from built in centralized systems to high quality sprayers to be used with existing hoses. Although a high pressure sprayer may reduce the need for scrubbing, no matter what system is used caked on organic material still needs to be mechanically scrubbed using a brush or mop

Sample cleaning protocols

1. **Mechanically remove** gross organic matter: by scooping poop, dumping litter and food, sweeping and/or rinsing with plain water. This still leaves behind caked on debris, such as dried on feces, dirt, and saliva. Removal of this requires…

2. **Clean using a detergent**/soap product and mechanical scrubbing with a brush, rag, paper towel, etc. This still leaves behind a film of potentially harmful microorganisms, which requires…

3. **Disinfect** using a germicidal product effective against whatever harmful agents are likely to be present. For areas that are not heavily soiled, in some cases steps two and three can be combined if a product is used that has both disinfectant and detergent qualities.

Dog run cleaning protocol.

This protocol was designed for general adult dog wards in a shelter with frequent enough parvo to warrant concern, using a quaternary ammonium compound with detergent qualities. In a shelter with infrequent parvo, bleaching dog runs weekly instead of daily may be acceptable.)

1. Get the supply cart from _____.

2. Move all dogs to one side of the ward and close the connecting kennel doors.

3. Fill and attach the disinfectant sprayer and make sure it is set to the correct dilution.
4. Spray any severely soiled runs with disinfectant solution and allow to soak while proceeding with cleaning.
5. Collect food and water dishes and stack on cart, collect used blankets and toys and place in hamper.
6. Scoop feces from each run using pooper scooper. Discard feces in designated trash can (on supply cart or one for each ward).
7. Spray each run with disinfectant, including walls, door and gate. Surfaces should be completely covered with disinfectant.
8. Using the stiff bristled brush, scrub off any caked on debris. Make sure the brush is labeled for the ward you are cleaning.
9. Spray main aisle with disinfectant.
10. Scrub aisle.
11. Empty pooper scooper bucket into drain. Spray pooper scooper, bucket and brush with disinfectant.
12. Disconnect the disinfectant sprayer and rinse all runs and aisle with water.
13. Fill the sprayer with bleach and make sure it is set to the correct dilution.
14. Spray runs, including walls, doors and aisle with bleach solution.
15. Fill the poop scooper bucket with fresh bleach solution.
16. Squeegee each run and aisle dry (if needed).
17. Feed and water all dogs. (Clean dishes and food on cart.)
18. Spray and wipe around doorknob using hand sprayer with disinfectant and paper towel.
19. Transport soiled blankets to laundry, soiled dishes to kitchen.
20. Restock cart.
21. After all cleaning is completed, remove jumpsuit and clean or change boots*

*Separate boots or shoe covers and a protective smock should be worn when cleaning isolation wards.

Once a week, prior to disinfection, cages should be cleaned and scrubbed with a degreaser, with careful attention paid to scrubbing cracks around gates, where wall meets floor and any other likely spots where dirt can hide. Doors, areas around light switches, hose handles and any other frequently handled areas should be cleaned.

Sample of a cat cage cleaning protocol

Again, this presumes a quaternary ammonium compound with detergent properties has been chosen for general cleaning. Because calicivirus is so common, bleach is also used daily.

Few shelters are designed to allow for easy and effective cleaning of cat cages. Shifting cats from cage to cage invites disease spread and makes it difficult to ensure adequate contact time for disinfection. Leaving the cat in the cage while it is being cleaned is logistically difficult and exposes the cat to disinfectant fumes. Placing the cat in a carrier means that the carriers also need to be cleaned. All of these methods require extensive handling of cats, which in itself can be stressful for the cats and result in worker injury, as well as spreading disease. Ideally, cat housing areas in the future will be designed to allow each cat a two sided cage, just as is the case in many dog runs, so that the cat can be safe and comfortable on one side while the other side is cleaned. Infectious disease is an even greater problem in cats than dogs in many shelters, and it does not make sense to continue designing cat holding areas that are not easily cleaned. For shelters without this luxury, however, compromise is required. Possible solutions include:

- Small cat box with door (made of plexiglas or other easily cleaned material) inside cage, cat goes in box while cage is cleaned, boxes are cleaned thoroughly between cats. This is often used in feral cat housing areas, but can be effective for tame cats as well, and has the added advantage of giving every cat a cozy place to hide.
- Rolling cage bank, cats placed in cage bank while cages are cleaned, cats replaced in the same cage they were in previously, cage bank is thoroughly sprayed and cleaned before holding next group of cats.
- Each cat assigned a cardboard carrier, placed in carrier for cleaning and then replaced in same cage, carrier goes home with cat when it is adopted.
- Metal or other easily cleaned transport cages are used to house cats while cages are being cleaned, and thoroughly cleaned between cats. This requires as many transport cages as there are cats to be cleaned, as reusing the same cage during a cleaning cycle does not permit thorough enough disinfection between cats.

Cage cleaning in a “jigsaw puzzle” fashion, that is cleaning one cage, moving a cat into it, then cleaning the just vacated cage and moving another cat into it is very time consuming and likely to spread disease, and is not recommended. Likewise, placing a cat in a holding cage while its cage is cleaned, then replacing the cat in its cage and putting another cat in the same holding cage will lead to disease spread. Even if the holding cage is wiped out between cats, it is impractical to allow ten minute disinfectant contact time between each and every cat.

Another important consideration in cat cage cleaning is control of disease spread via handler contact with soiled supplies. In the course of picking up dirty newspapers, emptying litter pans and so on, the cleaning attendant’s hands and clothing become

heavily contaminated. This person should not then go on to handle clean supplies and cats without a change of gloves and top, at least. This means either having two people clean each cat ward (it should take half as long, so no more total staff hours are required) with one person assigned to handle all dirty material, and the other to handle cats and clean supplies, or having one person put on a protective smock and gloves, go through and remove all dirty materials, clean the cages, then change gloves and remove the smock before handling clean supplies. If cat cages must be cleaned one by one rather than cleaning a whole bank or ward at a time, the two person system must be used. After cleaning is completed, all cleaning staff should change clothing and shoes before going on to handle animals for the rest of the day.

Cat cage cleaning should proceed in the following order: adoptable kittens, adoptable cats, stray kittens, stray cats, quarantine, isolation.

Before you begin: Put on a protective jumpsuit, boots, eye protection and gloves.(Masks should be worn if desired or if indicated for the product being used.)

1. Stock the cart with litter pans, food and dishes, paper towels, gloves and other needed supplies.

2. Put on the smock hanging by the door inside the ward.

3. Remove each cat in the ward from its cage* and place in its assigned carrier (cage number should be noted on carrier). Place the carriers in the hall outside the ward.

4. Remove and discard soiled paper, dump litter pans into trash, stack used litter pans and food dishes on the cart. Put dirty bedding in the laundry hamper.

5. Sweep debris out of any heavily soiled cages using the hand broom and dust pan designated for that ward. Sweep the floor of the ward. Remove stray turds using a paper towel. (This step is not needed if there is not much litter on the floor and the drains can easily handle what there is.)

6. Fill and attach the disinfectant sprayer and make sure it is set to the correct dilution.

7. Spray all cages with disinfectant, including all surfaces and doors..

8. Using the stiff bristled brush assigned to that ward, scrub all cages including doors.

9. Spray floor with disinfectant and scrub with brush.

10. Disconnect the disinfectant sprayer and rinse cages and floor with water.

11. Fill the sprayer with bleach and make sure it is set to the correct dilution.

12. Spray cages, including sides, doors, and floor with bleach solution.

13. Squeegee cages if needed.

14. Remove soiled smock, put on a clean pair of gloves.
15. Place clean paper, bedding, fresh food and water in each cage.
16. Replace cats in the same cage they were in before*.
17. Spray and wipe around doorknob using hand sprayer with disinfectant and paper towel.
18. Transport soiled blankets to laundry, soiled dishes to kitchen.
19. Restock cart.
20. After all cleaning is completed, remove jumpsuit and clean or change boots.

* In isolation or whenever handling sick cats or cats that have a known exposure to serious infectious disease such as panleukopenia, gloves should be changed or hands thoroughly cleaned with hand sanitizer or soap and water between handling each cat. Gloves are required when handling cats with panleukopen