The two most common problems in companion felines are house soiling (elimination of urine and stool outside of the litter box) and intercat aggression (Denenberg et al. 2005; Bamberger and Houpt 2006). While either can occur in a household with only one cat, often the problem occurs in homes with multiple cats. An understanding of feline social behavior and communication, elimination problem behavior, and feline aggression can help with diagnosis and treatment of these two interlinked conditions.

The Basis of Feline Social Behavior
Although cats have generally been considered asocial, they are capable of living in groups and do live in groups. These social groups tend to be matrilineal, with related females (mothers, daughters, aunts) and juvenile male cats. Within these groups, individual cats will form attachments to certain individuals and actively avoid others (Crowell-Davis et al. 2004). These groups form around abundant food resources, such as dairy barns, fishing wharfs, garbage collection sites, and parks provisioned by humans. Social groups formed of free-roaming cats may change members, with mature males and occasionally mature females leaving the group. This is in contrast to the human household, where the humans artificially create social groupings and the cats do not have the ability to leave should they find the situation unpleasant.

Bradshaw and Hall (1999) did a preliminary study observing the affiliative (friendly) behavior between 25 pairs of cats who had lived together for at least a year who boarded at a cattery. Related pairs are commonly found in physical contact with one another when compared to nonrelated pairs of cats. Unrelated cats tended to feed separately, while littermate pairs often ate from the same bowl or side by side. Littermate pairs also groomed and rubbed one another more frequently than non-littermate pairs. While it is not possible to infer a great deal from a small study in an unfamiliar environment, this does begin to mimic relationships seen in free-ranging cats.

Other studies have attempted to assess whether or not cats have some sort of social ranking system for determining access to resources. An early study by Bernstein and Strack (1996), which included 14 cats within one household, seemed to indicate that space within the household was not shared equally, with certain individuals having greater access to resources than others did. Although this is not necessarily evidence of a social ranking pattern, Knowles et al. (2004) also found some correlations between agonistic interactions away from food and ability to control interactions at the food bowl. Others have suggested that agonistic social interactions have more to do with perception of personal space than social dominance, but neither view is supported in all cases. Another possible theory is that cats fight to increase individual distance between them, and that it is not about territory at all (Barry 1999).

Feline Communication
Cats communicate with each other via visual contact, tactile communication, and marking behaviors. Body postures and facial expressions communicate information about underlying emotional state and potential behavioral responses. When greeting and investigating, a cat will carry its tail high and upright over its back and keep its ears erect; a relaxed cat usually has a hanging tail with the ears forward (Beaver 1992). When a cat has its head down, its tail away from the body, twitching quickly back and forth, and its ears with their openings pointing to the side, this indicates aggressive arousal. An inhibited cat may crouch and perhaps roll over with its ears back. A frightened cat will crouch, may hiss, and will flatten its ears to its head. An extremely fearful cat may arch its back, piloerect its hair, hold its tail straight up, and flatten its ears, and may become aggressive if cornered.

It is not clear if cats use dominant and submissive body postures for social communication. Some have suggested that dominant postures in cats consist of erect ears rotated to the side, staring, and the base of the tail arched, while submissive signals are described as avoidance of eye contact, turned-down ears and a lowered tail, and lying down and rolling over (Crowell-Davis 2002).

Tactile communication also occurs in cats when they lie together, rubbing against each other, grooming, and touching noses (Beaver 1992).

Felines use marking with urine or claws as a form of communication. Marking communication will leave a message even after the cat is no longer present. All cats will mark their territory in some manner, and if they are anxious,
frustrated, or distressed, the need for marking may increase. Even declawed cats will mark their territory using the scent glands found in the foot area. Cats will also use the scent glands on their heads and near their chins, ears, and mouths as well as the scent glands on the tail area.

**Elimination Problem Behavior**
Feline toileting in the wrong location (away from the litter box) and marking are the most common feline behavioral problems. House soiling can often be precipitated by medical problems; therefore, a good physical examination and a urinalysis are essential for all patients that are house soiling. Inappropriate elimination can also be a symptom of other medical abnormalities, such as hyperthyroidism, diabetes mellitus, or liver disease. Studies have indicated a correlation between underlying social issues among household cats and urine marking, and exploring relationships between cats is prudent to establish a diagnosis (Pryor et al. 2001).

**History for Toileting and Marking Problems**
A complete and thorough behavioral history is essential to determine what is going on and help formulate a treatment plan. Essential points include:

- Establish the duration and progression of the problem behavior.
  - Is it a new or chronic behavior?
- What type of elimination is deposited outside of the litter box: urine, stool, or both?
- Determine the location of the elimination, i.e., vertical deposition of urine or horizontal deposition.
- Gather information on the litter box.
  - Litter-box size, covered box vs. uncovered box, litter type, number of boxes and rate of cleaning, and box location.
- Obtain a diagram of the locations of inappropriate elimination.
- Determine the frequency of urination or defecation outside the litter box.
- Find out when (time of day) the owners typically find the elimination outside of the litter box.
- Determine what substrate (material) the cat eliminates on—Are there different substrates for urine and stool?
- Gather information about the household routine and any changes in the home.
- How many other pets are in the household, especially additional cats?
- Investigate the social relationships between the cats in the household, including any overt signs of aggression (hissing, growling, chasing) and covert signs of aggression (blocking, staring, supplanting from spaces).
- How do the cats share space, and which cats spend time together?
- Ask about all previous treatment attempts, behavioral, medical and pharmacological.

**Diagnosis**
The major diagnostic categories for feline inappropriate elimination include location preference, substrate preference, litter aversion, location aversion, and marking (Horwitz 2002). Non-litter-box use can also be influenced by stress, anxiety, and litter-box factors such as size, cleanliness, and placement. The use of a diagnostic category will help in the formulation of a treatment plan.

**Aggression between Household Cats**
Fights can occur between cats that have lived together for some time, perhaps due to a change in social status or a traumatic event; fights may be the sequel to redirected aggressive behavior or another anxiety-producing event; and aggression may occur with the introduction of another cat or in response to illness or social changes within the home. Fear, anxiety, and territorial responses all contribute to intercat aggression within a household. In all situations, contributory medical factors must be ruled out, identified, and treated.

**History Taking**
In taking the patient’s history, collect information regarding the daily routine and pet-owner interactions and how resources are allocated within the home. All participants in the aggressive behavior must be identified. Detailed descriptions of several selected aggressive episodes will help to identify triggers, participants, owner responses, and possible treatment options. Aggressive behaviors include blocking access to territory, staring, chasing, hissing, growling, biting and attacks, facial expressions, and body postures. Identify any treatment options already tried and discuss implementation and any effects they may have had on the problem behavior. Examine the ongoing behaviors
of the cats involved, noting signs of anxiety, fear, and defensive behaviors (hiding, inappetence, lack of evidence of grooming), to determine the effect of treatment and resolution on these signs. Examine litter-box use by all cats within the home, since social issues often contribute to non-litter-box usage or urine-marking behaviors.

**Diagnosis**

After a behavioral history is taken, attempt to reach a diagnosis. Common diagnostic categories include territorial aggression, social status aggression, redirected aggression, fear aggression, defensive aggression, irritable aggression, defensive aggression, offensive aggression, and intermale aggression.

**Factors That Lead to House Soiling due to Aggression**

Chasing and overt aggressive threats such as growling, hissing, and biting may be evident. However, threats between cats can be covert, including blocking access to locations, staring, or supplanting. In territorial disputes, one cat (the aggressor) will usually chase another (the victim). These chases are accompanied by vocalizations such as hissing, growling, and yowling. This may result in one cat living in a restricted area to keep away from the aggressor. Therefore, it may be necessary to create separate areas for food, resting places, and litter boxes for each cat in order to create harmony.

**Essential Elements in Treating House Soiling Linked to Aggression**

Within a multiple-cat household, there should be multiple litter boxes, food bowls, water bowls, and resting areas. These should not be clustered together, but placed throughout the environment, and the owner should keep in mind how the various cats access the space available to them when placing these items. Some cats may only have access to certain household areas, and if resources are not within those areas, anxiety and house soiling may result.

When multiple cats share litter boxes, the size and cleanliness of those boxes may become an issue. Research has indicated that when given a choice, cats prefer clumping litter materials to clay materials and the larger sizes of boxes. Litter boxes must be scooped out daily, and they must be totally emptied, washed, and refilled every 10 to 14 days.

In order to create harmony, it may be necessary to keep fighting cats separated unless supervised, or using structured introductions. Introductions can be accomplished using food or play, the goal being to create pleasant associations in each cat related to the presence of the other cat. It also might be helpful for the aggressor to wear an approved cat collar with a large bell that will forewarn the victim of the aggressor’s approach, to allow the victim to escape.

**Reintroducing Fighting Cats**

**Immediate Management Tools**

- Immediately after a fight, create separate spaces to isolate fighting cats while the owner works on introductions. This must be a secure area with a door that latches completely and/or locks. In this room, the cat must have a feeding/watering site, a litter box, perches at different vertical heights, hiding spots, scratching posts/pads, toys, etc. Make sure to remove all items of value or those that might be dangerous to the cat (e.g., plants, electric cords, strings) and any target items that may encourage inappropriate elimination (e.g., plush bath mats).
- A pheromone diffuser, such as Feliway, should be placed in the isolation areas and in the other parts of the home.
- To facilitate reintroductions, identify favored activities and/or treats for all cats involved in the problem behavior.
- Encourage play through the door. One option is to create a dumbbell toy under the door that separates the cats by tying two toys together with heavy string and placing one toy on each side of the closed door.
- Facilitate scent transfer between cats. Use a common piece of material, such as a towel, to pet each cat every day, wiping the towel against the cheek area and the base of the tail and alternating from one cat to the other, and leave this material with the cat.
- Do not allow overt, persistent aggression, such as hissing and growling at the barrier door. If this occurs, create a neutral zone by closing another door or creating a separation, perhaps by using baby gates in a hallway.
• The next step is to progress to short (< 5-minute) visual introductions. For this step, the cats are contained in some manner (in crates, on harnesses/leashes, or behind doors with windows) so they can’t make physical contact but can see each other. Try to engage the cats in a favored activity in their respective locations during these visual opportunities. Perform these 2 or 3 times daily until all the cats appear to be relaxed and there is no aggressive posturing. If there is aggressive posturing, the cats must be separated to avoid intimidation.
• Once the cats are relaxed when they visualize each other, food introductions outside of the isolation area can begin.

Counterconditioning and Desensitization Exercises
The focus is on counterconditioning and desensitization exercises to reintroduce the cats to one another. The goal is to allow the cats to be together without any aggressive behavior (growling, hissing, chasing, staring, etc.). Introductions are done slowly, using food to facilitate calm, non-anxious behavior (counterconditioning). The cats need to be far apart or on either side of a closed door so that they are relaxed (desensitization). Each cat is offered a delectable food treat that it will eat. For safety and control, it is often advisable to have each cat wear a harness and leash. If the cats will not eat, then they are too anxious and probably too close together, and should be moved further apart. If the cats still will not eat, then separate them until the next feeding. If the cats do eat at that time, they should remain together while they eat and then be separated. The next feeding is at the same distance. If things go well at that session, the next time the dishes can be moved closer together, but only 6 to 8 inches. If the cats are comfortable, sometimes they are left out, but leashed far apart, and they should remain under supervision so that they can groom, and then be separated again. Two feedings without the expression of any aggressive or anxious behavior are done at the same distance before the bowls are moved closer together. This is a slow process and must not be rushed. Allowing the cats to interact in an aggressive manner sets the program back and makes resolution more difficult. Keep the cats separated except for introductions, and always supervise them when they are together. It may also be helpful to switch litter pans between the cats to aid in familiarization. Another technique that may be helpful is to rub the cats with towels and switch the towel from one cat to the other to mix their scents, as mentioned above. Crates, screen doors, and other see-through barriers can also be used for introductions to allow the cats to see one another, but not get too close.

Drug Therapy
For some cases, the addition of psychotropic medication and pheromones can be helpful in resolving the urine spraying and the aggression. The drugs that are presently being used are not approved for use in cats and therefore are extralabel drug usage. Prior to use, all animals should have physical examinations, laboratory screenings for liver and kidney function, and, in some cases, electrocardiograms. Signed consent and release forms are advisable. Owners should be informed of potential side effects and plan to be home to monitor their pets for the first day or two of treatment. Several classes of drugs have been used to treat aggression in cats.

Fluoxetine and Paroxetine are selective serotonin reuptake inhibitors (SSRIs) used to treat aggression in cats. SSRIs may take several weeks to become effective. Common side effects include constipation, urinary retention, anorexia, gastrointestinal signs, tremors, irritability, and lethargy. Starting the patient at a low dose for 1 to 2 weeks and gradually increasing the dose can minimize side effects. Toxicity due to serotonin syndrome is possible when more than one antidepressant is used, and this should be avoided.

- Fluoxetine 0.5–1.0 mg/kg q 24 hrs; (also used in urine marking)
- Paroxetine 0.25–0.5 mg/kg q 24 hrs (Mills and Simpson 2002)

Clomipramine and amitriptyline HCL are tricyclic antidepressants used in the treatment of aggression in cats. Clomipramine is a serotonin reuptake inhibitor, while amitriptyline inhibits the reuptake of both norepinephrine and serotonin. Most tricyclic antidepressants have some antihistamine actions and can interfere with thyroid medications. Clomipramine and amitriptyline must be given daily to be effective and can take 2 to 4 weeks to facilitate a change in behavior. Common side effects include tachycardia, urinary retention, sedation, gastrointestinal tract (GIT) upset, mydriasis, and a dry mouth. Amitriptyline is very bitter and therefore administration may be extremely difficult. Because of potential increases in heart rate, exercise caution in patients with cardiac disease, and an EKG prior to use may be prudent.

- Clomipramine 0.25–0.5 mg/kg, p.o. q 24 hrs (King et al. 2004) (also used in urine marking)
- Amitriptyline 0.5–1.0 mg/kg p.o. q 12–24 hrs (Mills and Simpson 2002)

Medication is generally used for 6 to 12 weeks, and if the behaviors have changed, the animal is weaned off the medication by decreasing the dose 25% every 2 to 4 weeks while watching for a return of any aggressive indicators such as growling, hissing, or chasing. If aggressive behaviors return, maintain the pet at the same dose for several more weeks to see if the animal stabilizes before attempting to decrease the dose again.

**Conclusion**

In all house-soiling cases, consider the interactions between the cats. Questions targeting the use of space, which cats spend time together sleeping and grooming, and placement of resources throughout the home will help the veterinary team determine if these areas also must be targeted in the treatment plan. Without treating the social problems, house soiling is likely to continue and be unresolved.

**References**


Barry K. Intercat aggression in the household. AVMA convention notes. 1999;Veterinary Software Publishing.


