

## PROTOCOL FOR UNDERSTANDING AND TREATING FELINE AGGRESSIONS WITH AN EMPHASIS ON INTERCAT AGGRESSION

### Feline Aggression and Associations with Elimination Disorders

Feline social systems differ from those of dogs in many ways, and the history of cat and human associations is helpful in understanding these differences.

Cats were likely never truly “domesticated.” Ancestral cats are not very different from modern cats in either size or habit. Cats have historically been found near and around human settlements, because where there are people there is stored food, and where there is stored food there are rodents. A mouse or a rat makes a single meal for the cat on the go. Accordingly, modern cats are solitary hunters who live in matrilineal (mother focused) social groups. Unlike the situation with dogs, we have not substantially altered anything about their social behavior until fairly recently. When we started to purpose-breed cats to develop cat breeds/breed fancy, we focused on changes in color, coat texture, coat length, tail or ear shape, et cetera, not on enhancing specific jobs that different breeds do, as was originally the case with dogs.

It is not surprising that the types of inappropriate aggression witnessed by clients differ from those seen in dogs and that they are understandable given the evolutionary context of feline social systems and the developmental context of sensitive periods.

Categorization of feline aggression is similar to that of canine aggression; differences in the manifestation of the aggressions may be attributable to differences in mating behaviors and differences in social relationships and “hierarchies.” Feline aggression includes:

- aggression because of a lack of socialization,
- play aggression (also see the **Protocol for Understanding and Treating Play Aggression in Cats**),
- intercat aggression (main topic of this protocol),
- territorial aggression,
- fearful aggression (also see the **Protocol for Treating Fearful Behavior in Cats and Dogs**),
- maternal aggression,
- redirected aggression (also see the **Protocol for Understanding and Treating Redirected Aggression in Cats and Dogs**),
- predatory aggression, and
- impulse control (formerly “assertion or status-related”) aggression (also see the **Protocol for Understanding, Managing, and Treating Impulse Control/Status-Related Aggression in Cats**).

### Aggression Due to Lack of Socialization

Cats who have not had contact with humans prior to 3 months of age have missed sensitive periods important for the development of normal approach responses to people. Cats who are handled intensely and/or exposed to as many new things as possible between 2 and 7 weeks of age will have the best chance of dealing well with those stimuli. These patterns suggest that we did not domesticate cats. In dogs, where domestication is well established, the sensitive periods are long, flexible, and variable, a pattern thought to be a common sequela to domestication or a co-evolutionary process. Cats

are more like captive wolves: If you don’t handle them early, they do not develop easily into animals who enjoy handling.

Lack of early exposure to, and experience with, other cats may result in a lack of normal inquisitive and tolerant responses to other cats. Furthermore, total isolation from cats can have negative consequences for future interactions with humans. This constellation of deprivation scenarios may be contributory to many of the aggressions seen in urban, feral cats. These cats will never be normal, cuddly pets, although they may be fairly affectionate to one person or a small group of people who have worked with them over a period of time. If forced into a situation involving restraint, confinement, or intimate contact, these cats may become extremely aggressive.

### Play Aggression

Cats who were weaned early and then hand-raised by humans may never have learned to temper their play responses. Social play in cats peaks early and is replaced by more predatory activities by weeks 10 to 12, and by social fighting by week 14. Cats who, as kittens, never learned to modulate their responses may play too aggressively with people. These cats may not have learned to sheathe their claws or inhibit their bite. This is another reason to suggest that when adopting a kitten, clients should also take the mother, if possible. Otherwise, kittens should be brought into homes with other normal, healthy cats who can help them to modulate their responses, and teach them to play more gently.

It is not clear if there is a component of learning about oral responses that is missing when cats are bottle-fed. Were the kitten to nurse too hard on the mother or hurt her in play, the mother would swiftly correct the kitten. We are unlikely to be able to issue corrections with good timing or with appropriate intensity. Concerns about injuring the kitten are not trivial.

- The best ways to stop play aggression in cats include:
- Never play roughly with the cat.
  - Never “correct” the cat using your hands or teeth. This “correction” will *not* be equivalent to what mom does.
  - Redirect the cat’s play to toys that are large enough that if the kitten makes a mistake, she bites or swats the toy and not your hand (see photos on the following page).
- More detailed and specific advice can be found in the **Protocol for Understanding and Treating Play Aggression in Cats**.

### Territorial Aggression

Territorial aggression can be exhibited toward other cats or people. Such cats may delineate their turf by patrol, chin rubbing, or spraying or non-spraying marking. *It should be noted that territorial concerns are attributed to feline aggressions far more often than is supported by the data.* Because of complex, transitive, feline social hierarchies, a cat who is aggressive to one housemate, may not be aggressive to another, and all of this occurs within the same “turf.”

If the cat is defending and, or marking a turf, and the perceived offender crosses into it, threats and a fight may ensue. If part of the struggle involves social hierarchy, cats



(Bottom) A toy that encourages aerobic play in a manner safe for humans and cats. (Top) An example of an appropriate toy for cats. This toy can be thrown so that the cat chased the “tail,” not the human.

may lure or seek out their challengers and then attack after the “territory” has been “invaded.” Because of the over-riding social component, territorial aggression can be difficult to treat without also treating the intercat aggression, which is usually the main problem, particularly if there is a marking

component. Any marking problem should act as a flag for a possible underlying aggressive situation. Environmental modification (including space sharing), behavioral modification (including setting non-overlapping times to share space), and pharmacological intervention are all treatment options; however, aggressions involving strong, underlying social strife are notoriously difficult to treat once pronounced. Ultimately, one cat may have to be placed in another home or be banished to another region of the property.

### Fear/Fearful Aggression

There are “genetically friendly” cats and “genetically shy” cats. It is unclear the extent to which shy cats have the potential to become fearfully aggressive, but there are cats who, despite the best socialization possible, become aggressive whenever fearful. These cats also may become fearful without an apparent stimulus. Regardless, if threatened, any cat will defend himself. Depending on the type of treatment chosen, the cat can learn to become fearfully aggressive. Any intervention that makes a particular cat feel trapped will worsen fear aggression. This is why “flooding” is not recommended as a method to help fearful cats. “Flooding” is a technique that constrains two animals to be in each other’s presence without the possibility of physical or behavioral escape. It will always make a very frightened cat worse, and any pathology worse.

If small children are involved, fear and fear aggression are serious conditions, because the children may not know how to appropriately respond to a cat who is crouching. Any animal who is cornered and cannot escape has the potential to attack. It is imperative that the cat not learn that his only recourse is aggression, as this could lead to the cat becoming aggressive in response to any approach. Behavior modification can be very effective early in the development of a fearful condition but you have to realize that it is developing.

Pharmacological intervention can be an especially useful addition to treating fearful and fearfully aggressive cats, because it may affect how reactive they become and how they learn.

Please be aware that it is not clear if any intervention can be successful if the condition is genetic. This does not mean you should not try to improve the quality of life for the fearful cat—you absolutely must do so—but intervention needs to focus more on management and avoidance than on changing the cat’s global response to social interactions with humans. Please note, there is a full client handout to help with this serious problem: the **Protocol for Treating Fearful Behavior in Cats and Dogs**.

### Maternal Aggression

Maternal aggression, as in dogs, may occur in the periparturient period, and may be normal behavior. Queens may protect nesting areas and kittens, and aggression in such situations may be appropriate. When aggression appropriate for protecting nest and kittens occurs, threats intended to thwart further approach are the rule. Attacks are rare. Such threats are usually directed toward unfamiliar individuals. When maternal aggression is a pathological problem, the aggression is directed toward known individuals who pose no threat. Avoidance is the strategy of choice, because a cornered queen can attack. As the kittens mature, the aggression—whether appropriate or not—usually resolves.



## Redirected Aggression

Redirected aggression is seen in cats and dogs; however, it can be difficult to recognize in cats and may only be reported as incidental to another form of aggression. In redirected aggression, any interruption of an aggressive event between two parties by a third party results in redirection of the aggressive behavior to the third party or to another, uninvolved individual. It is important to realize that the interrupted aggressive event may only be a threat, so that the person (or animal) interrupting it may not realize what is occurring.

Cats appear to remain reactive for an extended period of time after being thwarted in an aggressive interaction, and if they continue to be reactive they can be quite hostile and potentially dangerous. Anyone who has a cat with redirected aggression needs to understand the potential risk and be aware of the subtle behaviors signaling the cat's increasing arousal and hostile intent. Because redirected aggression is often precipitated by another inappropriate behavior, it is essential to treat that behavior, as well. Treatment involves standard behavior modification techniques. If there is a socially mediated conflict within the household cats, some environmental modification may be necessary to decrease the extent to which the involved cats are capable of interacting. Clients should be encouraged to use inanimate objects (blankets, large pieces of cardboard, et cetera) to intervene between fighting animals. Use of objects minimizes danger to the clients and may have the benefit of aborting the behavior while teaching the cat that there are consistent, undesirable consequences to her inappropriate behavior. There is a separate, more detailed treatment handout on redirected aggression, **Protocol for Understanding and Treating Redirected Aggression in Dogs and Cats**.

## Predatory Aggression

Predatory aggression in felines is similar to that in canines. Hallmarks of this aggression include stealth, silence, heightened attentiveness, body postures associated with hunting (slinking, head lowering, tail twitching, and pounce postures in cats), and lunging or springing at a "prey" item that exhibits sudden movement after a period of quiescence. Solitary predatory behavior is developed quite young in kittens (5 to 7 weeks of age), and cats can become proficient hunters by 14 weeks of age, especially if they are hungry.

Cats can exhibit appropriate, although sometimes undesirable, predatory behavior to small animals.

- Belling cats (Bear Bells: [www.rei.com](http://www.rei.com)) can give some advance warning to small prey, but is not usually sufficient to avoid predation because of the element of stealth.
- Scat mats and indoor invisible fences are usually insufficient to deter a focused cat. No one should rely on such devices for protection of a victimized cat. *Aversive "treatments" like electronic mats can often make a reactive or aggressive cat more reactive or aggressive. There are also welfare and humane care issues involved in using these treatments and they are not recommended.*
- The best insurance for outdoor wildlife is to deny the cat access to them. In many parts of the world, this is becoming law as part of a strategy to protect endangered wildlife. Cat fences can fence either the cats or the wildlife in or out, giving both some ability to safely co-exist

([www.purrfectfence.com](http://www.purrfectfence.com), [www.catfencein.com](http://www.catfencein.com), [www.catterydesign.com](http://www.catterydesign.com)).

Cats kept indoors live longer than outdoor cats and are healthier than are outdoor cats. Unfortunately, intellectual stimulation is often missing in the life of an indoor cat. This does not have to be the case and there are many clever ways to avoid having an under-stimulated, fat, unengaged cat. Food puzzles, active toys that respond when the cat moves them, and other animals are just a few suggestions. When taught to do so young, cats will happily walk on leashes and harnesses or be pushed in pet buggies. More information on this can be found in the **Protocol for Understanding and Managing Odd, Curious, and Annoying Feline Behaviors**.

It's important to distinguish *predatory aggression*, a diagnosis and abnormal manifestation of behavior, from *predatory behavior*, usually normal feline behavior, and contextually appropriate, if undesirable. There is a lot of variability in feline temperament regarding predatory inclinations. Some cats have no interest in hunting, whereas other cats make *inappropriate context distinctions about prey items*.

The latter situations become a concern if the prey item is the owner's foot or hand, or a young infant. Any cat who exhibits the pre-pounce behaviors described above in these contexts may be at risk for inappropriate predatory aggression. Cats have recurved teeth and claws so bites or scratches should always be taken seriously. If the injured human is very old, very young, ill, or immunocompromised, scratches and bites from cats must be viewed as serious risks for infection and be medically attended.

Concerns about true, predatory aggression (the pathological diagnosis) is another good reason to never leave young infants of any species alone when pets are present. The cat who regards an infant as a prey item usually ceases to do so once the infant has matured sufficiently to demonstrate normal postural responses (e.g., the puppy is independently and effectively mobile, the human infant sits up and looks like a human). Regardless, any kind of true feline predatory aggression is a potentially very dangerous situation and utmost caution is urged.

## Impulse Control Aggression

Also called assertion or status aggression, impulse control aggression has been described as the "leave me alone bite" and most frequently occurs when the cat is being petted. The most similar situation in canines is also impulse control aggression (formerly "dominance" aggression); however, the divergent evolutionary history of canine and feline social systems argues that these are not homologous situations. These cats share with dogs with similar problems the need for control of the situation during a time of heightened reactivity. Given their different evolutionary histories, the mechanisms underlying the problem may be different for dogs and cats. Affected cats may be provoked by normal human behaviors. In other words, nothing you did provoked the cat intentionally; rather the cat becomes aroused when given attention and has a need to control when the attention starts and when it ceases. Some cats do this by biting and leaving, whereas the occasional cat will take your hand with its teeth, but not bite. Some biting can be severe.

Fortunately, you can learn to observe signs of impending aggression (staring, tail flicking, ears flat, pupils dilated, head

hunched, claws possibly unsheathed, stillness or tenseness, low growl) and interrupt the behavior at the first sign of any of these by standing up and letting the cat fall from your lap. You can abandon the cat and refuse to interact until she is exhibiting an appropriate behavior.

Do not physically “correct” these cats, because the cat may view a physical correction as a threat, and it may further arouse and intensify her aggression. If your cat does not respond to passive control or to attempts to redirect her attention to a toy or other object, it is safer to protect yourself in a way that will stop the behavior (e.g., drop a blanket over the cat). This intervention should be the least aversive possible. Your goal is to interrupt your cat’s behavior, not to teach her that you are a threat or someone to be feared.

If you can interrupt the behavior as it is starting, or, in a worst case scenario, within the first 30 to 60 seconds of the *onset* of the inappropriate behavior (which may be the pupil dilation and thoughts of stalking that the cat had when you sat on the sofa), you may encourage the cat to learn not to exhibit the behavior. However, if you scare the cat with your “interruption” you have done harm. Cats with this problematic aggression are never going to be hugely cuddly, although, if you can refrain from petting them, they may be willing to sit quietly on your lap for extended periods. Please note, there is a full protocol to help with this quite serious problem, **Protocol for Understanding and Treating Impulse Control Aggression in Cats**.

### Intercat Aggression

“Normal,” nonpathological aggression between cats is common only if the cats are toms. In most wild, feline social systems, few males mate with most of the females. The skewed sex ratio in the breeding population is induced and maintained by vigilance and aggression on the part of the males. There is an additional olfactory component of spraying and non-spraying marking that contributes to the aggression and relative “status.” The aggression exhibited by males in these circumstances is classic and involves flattened ears, howling, hissing, piloerection, threats using eyes, teeth, and claws, and outright combat. Early neutering (prior to 12 months of age) decreases or prevents fighting by 90%. It is not clear if very early spaying and neutering programs would further reduce this, but given the hormonal facilitation of the aggression, one would hypothesize that this would be the case.

That said, **true intercat aggression, which is far more common and more likely than is territorial aggression, is pathological and is more commonly based on conflicts within social relationships/hierarchies than it is with sex.** Cats begin to become socially mature somewhere between 2 and 4 years of age. At this time, some cats may begin to challenge others. Problems arise when one cat will not accept lack of engagement by another cat. Responses include passive aggression (staring and posturing), active aggression (hissing, swatting, pouncing, biting), and marking. Cats who consider themselves as more equal are less likely to participate in overt and active aggression—expect covert and more passive aggression (Table 1 provides a sample format by which to understand the variants of this form of aggression). Intercat aggression is extremely complex, often subtle, and underappreciated.



Cats can mark using scratches, as seen in the top photo, or by rubbing, as seen in the photo on the bottom. The tree at the top (*top photo*) sits between the area occupied by two groups of lions. Rubbing leaves an odor mark, and may leave an oily mark that is visible on a clean wall. Scratching leaves clear visual marks, in addition to the odor marks from foot glands.

Cats who are afraid of other cats can be afraid because they have been attacked, and may develop fearful behavior or fear aggression as sequelae. Fear can also develop without attack. Co-occurrence of diagnoses should alert clients and veterinarians to ask which came first.

Cats who react as if there is a challenge about social status when there is none are reacting inappropriately and out of



**TABLE 1****Model for Thinking About Phenotypic Patterns of Feline Aggression****Potential Axes**

- Overt vs. covert aggression
- Active vs. passive aggression
- Offensive vs. defensive aggression

**Sample Scenarios**

- Overt, passive, offensive aggression: confident cat staring when another enters room
- Overt, passive, defensive aggression: less-confident cat leaving room or backing up and withdrawing into smaller space, tail tucked, vocalizing
- Covert, passive, defensive aggression: vanquished or less-confident cat marking with mystacial glands in boundary areas or areas from which cat had been displaced
- Covert, active, offensive aggression: vanquished or less-confident cat marking with urine or feces in boundary areas or areas from which cat had been displaced
- Overt, active, offensive aggression: chase and attack using teeth and accompanied by vocalization by resident cat toward new cat in environment
- Overt, active, defensive aggression: attack or response using hitting and/or swatting while leaning back or avoiding further pursuit
- Covert, active, defensive aggression: withdrawal and marking of restricted area by victim cat
- Covert, passive, offensive aggression: displacement or theft of "bully" or higher ranking cat's toys, bed, food, or hidden copulations (?), accompanied by non-elimination marking

context. If there is a challenge (staring, blocking, hackles up, hissing, swatting, growling, et cetera) of any kind, a reaction might be appropriate, but it is important to remember that as is true for people, many normal social behaviors in cats have rules. If one cat responds to another cat's stare or approach by leaving, it would then be an inappropriate social response for the staring cat to track down the cat who, appropriately, turned and left, and subject that cat to more aggression and more overt aggression. When this happens you know you have a problem. Most aggression in cats is far more subtle than it is in dogs, and because of this, may be more damaging to household situations.

Most intercat aggression occurs between housemates, and it may occur more commonly between different sex housemates, in contrast with dogs. Also, because feline systems are matrilineal, aggression may only become apparent after the loss of a "matriarch" or cat fulfilling this role. It is not unusual for cats to have lived in relative harmony together for 2 years before there are problems because the development of these problems reflects the intrinsic change that all social animals experience when they become socially mature.

Challenges can involve staring, vocalizing, or outright aggression. Cats can start with staring and escalate to overt

aggression. Regardless, it is important to treat the problem as soon as it becomes apparent. The longer that the problem is allowed to persist, the worse the cats will get.

In profound cases of intercat aggression, the situation is not simple. This is especially true if multiple cats are in the household because cats form coalitions. This means that a cat who has been neutral to another specific cat may change her behavior depending on the addition or loss of new cats and the shifting of coalitions. Also, these relationships are not absolute. They change with age, health, and, most importantly, with context.

The behaviors associated with these relationships can be affected by the people who are present and by how those people interact with them. Some relationships apply only to feeding and sleeping orders. A cat who challenges one cat may not care about another cat in the household that, to all outward appearances, seems to act the same and be the same age and sex. Chances are they are not acting identically, and it is in the subtleties that the problems with the relationship occur.

**Treatment of Intercat Aggression**

Treatment of intercat aggression focuses on keeping everyone safe, and on setting and maintaining a new social arrangement where no one has to sustain constant threats. Generally, reinforcement (attention, play, treats, praise, et cetera) is given to the cat who is behaving most appropriately. You can most easily determine this by videotaping your cats and working with your veterinarian to understand what's going on between the cats. Identification of problem cats and those who are really normal is actually pretty easy if you can watch the cats in an unbiased manner. This is the advantage of videotape over real-time. The specifics of treatment follow.

- First, **never physically punish these cats.** All you will do is to raise their level of distress, and they might feel that they have to fight you off. Clients are often injured when disciplining or separating fighting animals. You could make a bad situation worse by further causing the involved cats to be reactive and to learn that you are a threat.
- Second, if at all possible, never reach between two fighting animals. Most people have good intentions and want to separate fighting animals to prevent injury to them, but if you place your body parts between the animals, you may be accidentally injured.
- If you know that you have a problem with your cats, watch them like a hawk any time they are together and keep cardboard, a broom, a bucket of water, a hose, a bottle of unopened club soda or seltzer, or a blanket handy. These are all "remote control" items that you can use to separate the cats safely. If no small children, high-strung humans, or nervous animals are in the house, a loud noise, like that generated by a foghorn, can also help to separate the animals *for whom nothing else works*, but this should be a last resort and is an indication that the cats' aggression is seriously out of control. **Screaming by humans, particularly young humans, will worsen the situation.**
- Generally, once the cats are apart, they start to calm down, and you can remove the aggressor. The aggressor should be locked in a neutral area with water, a litterbox, and, if they will eat, some food. You will have to plan ahead and be careful about how you will provision your cat, and ensure

that she is kept enclosed until she is truly calm. Please remember that **cats can stay reactive for 24 to 48 hours** and that you may have to banish them while still protecting yourself. By removing the victim, instead of the aggressor, you may enhance the “helplessness” of the victim in the eyes of the aggressor. You don’t want to do this, if possible. Still, it is important to remember that any animal who is injured hurts and is frightened. Frightened animals can bite you without being malicious. Avoid potential bites by transporting cats to be separated using blankets and boxes.

## Basic Treatment Tips and Tick List

1. First, keep all cats involved in the intercat aggression separated at all times when not supervised. If you are able to identify the aggressor, the aggressor cat should be confined to the less-desirable room (a spare bedroom, rather than your bedroom; a pen in the heated, well-lit basement, rather than the kitchen where the dogs are fed). All other cats should have free range. Again, watch for changes in coalitions that may not be in the direction that you find helpful!
2. Bell the cats with different sounding bells (Bear Bells: [www.rei.com](http://www.rei.com)). Breakaway collars that will come apart if they snag on furniture or other objects are now widely available and are a safe option for attachment of bells in all environments. If the cats are loose, you must be willing to supervise them. The bell will tell you when the aggressor is approaching and when the problem animals are close together. The bell will also alert the victim cat that the aggressor is approaching. The cats can have a chance to approach each other **if and only if** you are confident that you can control them long-distance, and prevent any injury. Please remember that **injury can be physical or behavioral**. Of these, **the behavioral injury may be worse for many cats who learn to live in constant terror**. If you do not feel that you can control interactions, you must separate the cats in a manner that prevents fighting and covert threats such as stares or urine marks.
3. Choose an order in which to reinforce the cat based on identifying which cat is behaving the most appropriately. **Remember that reinforcement is not about rewarding the pushiest, most “dominant” cat;** it’s about rewarding the cat who is most appropriate so that all the cats get the message that obnoxious behaviors are not rewarded, but calm, nonthreatening ones are.
  - Reinforcing the chosen cat has active and passive components. First, separate the cats as discussed above. Second, enforce the concept that the cat being threatened has the right to exist by feeding him first, letting him out before the others (if the cats go out), giving him a treat or toy first, playing with him first, grooming him first, et cetera.
  - **You are not imposing a “rank” order on these cats;** instead, you are encouraging the normal types of social deference that would be exhibited by cats under normal conditions. By reinforcing an appropriately behaved cat, you encourage the normal fluidity of the social system.
  - You can also more passively encourage the aggressor to understand that the victim has some status by allowing the victim to sleep in a crate in your room, on a bed there, or on your bed, while the other cat is banished to a room or crate outside your room. This has nothing to do with beds and “spoiling” and everything to do with the fact that access to preferred spots or to attention is a currency.
4. Use harnesses with cats, if they are going to be together. Harnesses give you a quick way to intervene if you need it, while gradually reintroducing the cats to each other when there is no attention being given. For example, watch TV while both cats sit quietly, secured at a distance where they can see each other, but not lunge, and connect.
  - If the cat who has been problematic stares at the cat you are trying to reinforce, gently turn his head away from the other cat and toward you so that he can take his cues from you.
  - If the cat who you are trying to reinforce stares at the other, ignore him if the other cat doesn’t react.
  - If the other cat does react, interrupt the reaction by asking the staring cat to look at you. If this does not work, or if the aggression intensifies, remove the most aggressive cat and banish him.
  - If the cat who you are trying to reinforce stares at the other cat and the other cat looks away, reward them both with food treats—that is exactly the type of fluid and flexible behavioral relationship you are trying to reinforce.
5. Anti-anxiety medications may help or may be required for some cats who otherwise are not able to succeed in this program (Table 2). Please remember that if it’s decided that medication could benefit your cat, you need to use it **in addition** to the behavior modification, not instead of it.
  - Benzodiazepines, although humanly abusable, can be excellent drugs for some cats who have combined elimination/aggression problems because of underlying nonspecific anxiety that results in a decrease in outgoing behavior in the affected cat. Clients should be advised to watch for any signs associated with liver disease, although these are extraordinarily rare. At low dosages, benzodiazepines act as mild calming agents, facilitating daytime activity by tempering excitement. At moderate dosages they act as anti-anxiety agents, facilitating social interaction in a more proactive manner. At high dosages they act as hypnotics, facilitating sleep. Ataxia and profound sedation usually only occur at dosages beyond those needed for anxiolytic effects. Note that the duration of action of the parent compound, diazepam, and its intermediate metabolite, nordiazepam (*N*-desmethyldiazepam) in cats is 5.5 hours and 21 hours, respectively. For this reason, it is

**TABLE 2****Useful Medications (Brand Names Are Those in the United States)**

- Alprazolam (Benzodiazepine; Xanax): for the victim, primarily, to make more outgoing and friendlier; for the aggressor if aggression is secondary to anxiety about interaction and increased friendliness will help
- Amitriptyline (TCA; Elavil): for the victim or aggressor with nonspecific anxiety
- Nortriptyline (TCA; Pamelor): for the victim or aggressor with nonspecific anxiety and sedation with amitriptyline
- Clomipramine (TCA; Clomicalm): for the victim or aggressor with more specific anxiety
- Buspirone (NSA; BuSpar): for the victim, only; may make more outgoing and situation resolves with some overt aggression
- Fluoxetine, paroxetine (SSRI; Prozac, Paxil): for more specific anxieties involving outburst (fluoxetine) and social (paroxetine) anxieties

best to choose benzodiazepines that do not use this intermediate metabolite (e.g., oxazepam, alprazolam).

- Tricyclic antidepressants (TCAs) act to inhibit serotonin and norepinephrine (NE) re-uptake, and can be useful for some cats that spray, some who are averse to or anxious about their litterbox, and cats who are experiencing anxiety about their social situation. Drugs of choice include amitriptyline and its active intermediate metabolite, nortriptyline, and clomipramine. Knowledge of intermediate metabolites can be important: Animals experiencing sedation or other side effects with the parent compound may do quite well when

treated with the intermediate metabolite alone. For example, cats who become sedated or nauseous when treated with amitriptyline may respond well when treated with nortriptyline at the same dose as the former has twice the NE re-uptake effect of the latter.

- Partial 5-HT<sub>1A/B</sub> agonists (e.g., buspirone) have few side effects, do not negatively affect cognition, allow rehabilitation by influencing cognition, attention, arousal, and mood regulation, and may aid in treating aggression associated with impaired social interaction. Because buspirone may make cats more outgoing and assertive, you may have overt aggression where it previously did not occur, as part of the outcome of changing social interactions.
- The selective serotonin reuptake inhibitors (SSRIs) (fluoxetine, paroxetine, sertraline, and fluvoxamine) are derivatives of TCAs. These compounds have a long half-life, and after 2 to 3 weeks, plasma levels peak within 4 to 8 hours. Because these medications act to induce receptor conformation changes, an action that can take 3 to 5 weeks, treatment must continue for a minimum of 6 to 8 weeks before a determination about efficacy can be made. Most of the SSRI effects are a result of highly selective blockade of the reuptake of 5-HT<sub>1A</sub> into presynaptic neurons.
- Newer treatments involving synthetic pheromonal analogues (e.g., Feliway in spray or diffuser form) have not been subject to the type of rigorous, blinded scientific testing to demonstrate an effect. Few good, scientific studies have been conducted, and the need for such studies is more critical in this situation than in those involving some oral medications because the mechanism of action of pheromonal analogues is often asserted, but remains little tested and unknown. In the few studies that provide reliable information, effects are minimal and may involve some lowering of overall reactivity.