Abstract

Understanding the underlying causes of owner-directed aggression in cats based on presentation of different types of aggression plays a crucial role in guiding effective treatment. The treatment plan involves identifying and avoiding triggers, establishing a positive relationship between the owner and the cat, implementing environmental enrichment and behavior modification, and incorporating medication if necessary.
One of the most common feline behavioral problems presented to veterinary behaviorists is feline aggression toward humans.\textsuperscript{1} Although cat-inflicted injuries are reported less frequently than dog-bite incidents, they carry a higher risk for infection due to cats’ sharp teeth and claws. Such injuries are particularly concerning for people with weakened immune systems, such as older adults and children.\textsuperscript{2}

In addition to physical injury, owner-directed aggression can deteriorate the human–animal bond, potentially leading to the cat being abandoned or euthanized.\textsuperscript{3} Even when those outcomes are avoided, feline aggression often indicates underlying stress that can negatively affect the cat’s welfare. Cats direct aggression toward their owners for various reasons, the main causes being fear, petting, redirected aggression, and misdirected play (TABLE 1). This article explores the different types of owner-directed feline aggression and provides comprehensive treatment plans for addressing them.

### TYPES OF OWNER-DIRECTED FELINE AGGRESSION

**Fear-Related Aggression**

Fear-related aggression is a common problem, often driven by a cat’s need to establish distance from a perceived threat. Cats can resort to aggression when they feel trapped without the option to hide or escape from a threatening situation.\textsuperscript{4} Signs of a fearful cat are ears pulled back, tense body posture, lowered body and tail, dilated pupils, and piloerection (fur standing on end). In addition to these physical cues, cats may vocalize fear by hissing, growling, or screaming.

### Take-Home Points

- Owner-directed feline aggression is a significant behavior concern because it negatively affects the bond between cats and owners and the welfare of both.
- The primary forms of owner-directed feline aggression are fear related, petting induced, redirected, and misdirected play.
- A 5-step treatment plan consists of the following steps: avoiding triggers; rebuilding the owner-cat relationship; enriching the cat’s environment; implementing behavior modification; and adding behavior medication, if necessary.
Although any cat can exhibit fear-related aggression under certain circumstances, several factors contribute to fear-related aggression. One factor is lack of socialization during early development. Cats that have not been exposed to various people, animals, and experiences during their formative weeks are more likely to exhibit fear-related aggression later in life. There might also be a genetic component to fear-related aggression as some cats are naturally more predisposed to anxiety and fearfulness.

If a cat learns that its aggressive actions effectively deter perceived threats, it can become more likely to resort to this behavior pattern when threatened again. Any practiced behavior, whether wanted or unwanted, becomes perfected behavior.

**Petting-Induced Aggression**

Petting-induced aggression is relatively common, comprising approximately 40% of all feline aggression cases seen by behaviorists (VIDEO 1). Owners are often perplexed by their cat’s behavior in this context. Although some cats refuse to be petted from the start, others may seek the owner’s attention; however, while the owner pets the cat that sought attention, suddenly it bites or claws the owner and runs off. This behavior is usually described as unpredictable, but some owners have noticed subtle body language changes in their cats before the aggression, including stiffened body, tail twitching, ears back or rotating, and dilated pupils.

Although the exact cause and mechanism of this form of aggression have not been fully explained, a couple of theories have been suggested. One theory is that the petting and stroking can cause tactile sensory overstimulation. For example, the owner could be petting the cat for too long and past its tolerance threshold. The aggression might also result from conflicting motivations between approaching and withdrawing. The cat might want to sit close to the owner but not want active physical touch, or the cat solicits the owner’s attention for a short stroke but wants to end the interaction as the owner’s petting gets more extended than the cat wants. It has also been theorized that the owner may be petting areas of the body other than the head or neck, where cats generally groom each other; the tolerance level for touch in these areas before aggression is exhibited varies between cats. Another theory is that the neurologic pathway for pain and touch are shared, and therefore prolonged touch could cause arousal, pain, and excitement.

**Redirected Aggression**

Although not a specific diagnosis, redirected aggression accounts for approximately 50% of cases of feline aggression toward humans, especially their owners, and warrants identifying and addressing. Cats redirect their aggression when aroused by a trigger that the cat

<table>
<thead>
<tr>
<th>TABLE 1 Types, Triggers, and Signs of Owner-Directed Feline Aggression</th>
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<tr>
<td><strong>TYPE</strong></td>
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<tr>
<td>Fear-related aggression</td>
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<tr>
<td>Petting-induced aggression</td>
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<td>Redirected aggression</td>
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<td>Misdirected play aggression</td>
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<td><strong>SIGNS/CHARACTERISTICS</strong></td>
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cannot access. In this situation, the cat turns its aggressive behavior toward a secondary but accessible target nearby. Any type of aggression could become redirected, but fear is reported as the most common underlying motivation. Possible triggers for redirected aggression vary widely, including loud or unusual noises, the smell of other cats (or dogs), or an unfamiliar person or environment. Triggers commonly reported by owners are outdoor stray cats and the owner’s intervention during fights between household cats. After a cat has been aroused by a trigger, it may remain in a highly aroused state for a prolonged time, ranging from hours to days. Identifying the primary trigger can be challenging for owners, especially if they were not present during the cat’s initial arousal. Moreover, cats tend to strongly associate the primary trigger with the secondary target, which can solidify the motivation for aggressive behavior to the secondary target and can cause aggressive behaviors to be persistently directed to the new target when the primary trigger is no longer present.

Misdirected Play Aggression
Misdirected play aggression in cats is often seen in kittens and young cats. This behavior may become more injurious as the cat ages, especially if it has not learned proper bite and claw inhibition. Play aggression often involves predatory sequence behaviors such as stalking, crouching, chasing, and pouncing. Play aggression is distinguished from other types of aggression by rarely including vocalizations like hissing or growling. Although play is normal feline behavior, when the play is intense, it can cause injuries, from light scratches to more severe skin-breaking bites. Misdirected play aggression can sometimes be associated with previous inappropriate play with humans, such as using hands or feet as toys.

Play aggression could be linked to early weaning, limited interaction with littermates, young cats without other household cats, lack of suitable play opportunities, inappropriate play patterns with owners (e.g., rough foot and hand play), and experiencing physical restraint or confrontation during play.

**TREATMENT**
Effective treatment of the various types of owner-directed feline aggression requires a comprehensive treatment plan. Bergman and Gaskins developed a 5-step program on which behaviorists base straightforward yet complete treatment plans for the various types of aggression (BOX 1).

**Step 1: Identify and Avoid Triggers**
The first step is identifying the aggression triggers, when possible, and then avoiding them. For owners to identify triggers, they need to be able to understand their cat’s body language. Simple resources to help them monitor their cat for certain body postures and behaviors can be provided (see example at go.navc.com/49dbAPv). If the triggers are unclear, ask owners to keep a diary for each incident and describe the situation surrounding the event.

Avoiding triggers is useful for 3 reasons: improving safety, decreasing the cat’s stress, and enhancing the cat’s learning opportunities. First, in terms of safety, especially with regard to aggression, avoiding triggers can prevent potential injuries. Second, encountering triggers that include states of high arousal or stress can negatively affect a cat’s welfare; moreover, it could also make the owner anxious and stressed, thus deteriorating both their welfare and their bond. Third, if the aggressive behavior persists, the cat will be too emotionally aroused to learn new behaviors and will also have the opportunity to repeatedly practice the unwanted behavior, which could lead to the behavior becoming fixed over time.

Before a cat that exhibits fear-related aggression can form a positive relationship with its owners, it needs to learn that the owner is not a potential threat. The owners might have to increase the distance from their

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**BOX 1 Five-Step Treatment Plan for Owner-Directed Feline Aggression**

- **Step 1:** Identify and avoid triggers.
- **Step 2:** Rebuild a positive relationship between the owner and cat.
- **Step 3:** Provide environmental enrichment and tools.
- **Step 4:** Use systematic desensitization and counterconditioning for behavior modification.
- **Step 5:** Use medication, if necessary, to reduce anxiety and frustration and facilitate learning.
cat and reduce contact time. Because petting-induced aggression might be triggered by an owner’s extended petting time or petting areas of the body other than those that the cat tolerates, owners should try shorter petting sessions in areas under the cat’s threshold. For redirected aggression, if owners notice the cat is in a state of high arousal, they can avoid contact by placing the cat in a quiet, dark, safe room until it fully calms down. They can avoid direct physical contact by lifting the cat with a thick blanket or towel or encouraging it to move to another room.

**Step 2: Relationship Rebuilding**
Re-establishing a positive relationship between the owner and the cat is essential, particularly when dealing with cats that direct aggression toward their owners. To rebuild a healthy and reliable bond between an owner and a cat, all interactions should be predictable and positive as unpredictable interactions could lead to anxiety and, therefore, aggression.

A trustworthy relationship between owner and cat can be built by structuring every interaction with a cue-response-reward pattern. This type of interaction provides predictability for the cat and allows the owner to figure out whether the cat is interested and comfortable enough to interact. For more information and a client handout that can be shared in the clinic or online, visit go.navc.com/3T4Xlqp.

Punishing (e.g., yelling, spraying water, physical blows) aggressive cats is contraindicated. It can make aggression more likely, can undermine the potential of forming a positive relationship, and will most likely cause or worsen the cat’s fear and defensive aggression.

**Step 3: Environmental Enrichment and Tools**
Appropriate tools can be used to implement the preceding 2 steps effectively (BOX 2). Various tools can be either manufactured products or homemade by owners. Because the tools needed can differ for every cat and situation, some trials may be required. However, some tools should be available to all cats for good welfare and husbandry, which can, by themselves, prevent or help address several motivations for problematic behavior. Providing enough mental and physical stimulation is essential for indoor cats as it can alleviate their anxiety or frustration.

Besides food, water bowls, litter boxes, resting areas, and scratching surfaces, additional resources may enhance cats’ normal behaviors. Multiple food toys and food puzzles can help the cat diffuse its motivation to practice predatory behaviors. All cats should have an independent, safe hiding spot (for the cat only), along with various vertical and horizontal resting areas. All of these resources can be offered in “core areas” so that the cat can access all its basic needs without having to venture to areas where it might encounter a fear trigger, conflict, or confrontation, which is especially important for cats that exhibit fear-related or petting-induced (conflict-related) aggression. For cats that are frightened or easily aroused by noise, a white noise machine could be helpful. If stray cats outside are a visual trigger, applying window film could block the trigger for an indoor cat, and removing sources of attraction for outdoor cats (e.g., bird feeders, outdoor feeding stations) could keep outdoor cats away.

Comprehensive information on feline environmental needs can be found elsewhere.

**Step 4: Behavior Modification**
Behavior modification for aggressive cats is based on desensitization and counterconditioning. Desensitization involves gradually reintroducing the triggers while avoiding the recurrence of unwanted behavior to raise the threshold for the emotional state that leads to fear and/or aggression.

**BOX 2 Tools for Enriching a Cat’s Environment**

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<th>Essential</th>
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<tr>
<td>Food and water bowls</td>
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<td>Litter boxes</td>
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<tr>
<td>Resting areas</td>
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<tr>
<td>Scratching surfaces</td>
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<tr>
<td>Safe hiding spot for the cat only</td>
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<tr>
<td>Various vertical and horizontal resting areas</td>
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<table>
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<td>Food toys and food puzzles</td>
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<td>White noise machine (if the cat is easily aroused by noise)</td>
</tr>
<tr>
<td>Window film (if outdoor cats are visual triggers)</td>
</tr>
<tr>
<td>Removal of stray outdoor cat attractions (if outdoor cats are visual triggers)</td>
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Counterconditioning is changing the underlying emotion of the trigger or context from negative to positive.\(^4\) Counterconditioning refers to using something the cat views as inherently very pleasant, such as high-value food treats, to help it learn to perceive the previously frightening trigger as more pleasant because it is now reliably associated with treats. For cats with fear-related aggression directed toward their owners, the cat is offered high-value treats in the presence of the owner. Doing so can be paired with systematic desensitization by initially, to prevent fear, maintaining a distance between the owner and cat. After the cat can accept treats in a relaxed state with the owner present, the owner can gradually approach the cat. If the cat becomes uncomfortable at a specific distance, the owner should return to the previous distance and repeat the exercise over several sessions.

For cats that exhibit petting-induced aggression, the owner gradually increases the duration of petting while providing treats before the cat reaches the tolerance threshold.\(^5\) The time required for behavior modification may vary between individuals, and behavior medication can help facilitate the behavior modification process.

Because cats, like dogs, are also trainable, owners can apply operant counterconditioning to teach replacement behavior and more appropriate coping strategies. Providing basic cues such as "sit," "go to mat," and "touch" could be helpful for response substitution to intervene and prevent aggressive behavior when the cat's arousal is escalated.

Medication selection can be based on medical examination and diagnostic testing (e.g., complete blood count, serum chemistry panel, urinalysis) to rule out potential medical issues that might initially seem to be behavioral problems and to help determine the most suitable options for each patient. Cat owners should be given information about how to use the medications, what to expect, possible side effects, and the potential need for long-term administration.\(^7\) Owners might also need to be given options for how to give the medication to the cat in a low-stress and safe manner.

Regular checkups and laboratory tests should be considered a required step of the comprehensive treatment plan for a behavior complaint, as it would be for patients with other chronic medical problems.\(^5\)

**Step 5: Medication**

A comprehensive treatment plan for cats that exhibit aggression based on fear, stress, or anxiety may require use of medication. Recommended agents are selective serotonin reuptake inhibitors (e.g., fluoxetine); tricyclic antidepressants (e.g., clomipramine); and venlafaxine, a serotonin noradrenaline (norepinephrine) reuptake inhibitor.\(^8,17,18\) Adjunctive medications are gabapentin and pregabalin, which have been recently suggested to alleviate transportation-related anxiety and fear.\(^19\)

Medication for fear-related aggression helps reduce anxiety, facilitating the cat’s learning that perceived threats are not harmful. For cats that exhibit redirected aggression, medication can be based on the cat's arousal level and the primary trigger. Medication to reduce anxiety can be useful, but it should be combined with behavior modification.\(^20\) Adding medication can help give desensitization a more attainable starting point and help behavior modification progress at a faster rate.

**SUMMARY**

Owner-directed feline aggression is a significant behavior concern because it negatively affects the bond between cats and owners and the welfare of both. The primary forms of owner-directed aggression are fear related, petting induced, redirected, and misdirected play. Addressing these types of aggression requires implementation of a comprehensive 5-step treatment plan. This approach addresses aggression and improves the wellbeing of cats and their owners. **TVP**

**References**

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Instances of dogs chewing through closed vials of PROIN® and eating the vial contents have been reported, in some cases resulting in overdose. Keep the product in a secured storage area out of the reach of pets in order to prevent accidental ingestion or overdose, as dogs may willingly consume more than the recommended dosage of PROIN® Chewable Tablets or PROIN ER™ tablets. Contact your veterinarian immediately if the dog ingests more tablets than prescribed or if other pets ingest PROIN® Chewable Tablets or PROIN ER™ tablets.

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Owner-Directed Feline Aggression

TOPIC OVERVIEW
Owner-directed feline aggression is a significant concern, negatively affecting the bond between cats and owners and the welfare of both, as well as potentially leading to injury. The primary forms of owner-directed aggression are fear based, petting induced, redirected, and misdirected play. Addressing any type of owner-directed feline aggression requires a comprehensive treatment plan.

LEARNING OBJECTIVES
After reading this article, veterinarians should be able to understand the primary forms of owner-directed aggression in cats and be able to create a simple but complete treatment plan.

1. Which is not the body language of a fearful cat?
   a. Dilated pupils, tucked tail
   b. Piloerection, stiff body
   c. Growling, lowered body
   d. Ears forward, chirping

2. Which is a risk factor for fear-related aggression in cats?
   a. Attending a quality kitten class
   b. Lack of socialization during early development
   c. Growing up with multiple littermates
   d. Pairing handling with food treats as a kitten

3. Cats with petting-induced aggression rarely approach their owners first to seek attention.
   a. True
   b. False

4. Which of the following regarding redirected aggression is correct?
   a. Following exposure to a trigger, a cat can stay in a prolonged arousal state, varying from hours to days.
   b. The most common underlying emotion associated with this aggression is play.
   c. Cats will show aggression to the secondary target only when the primary target is actually present.
   d. Cats will show aggression to the secondary target only if that person tries to pick them up.

5. A 9-month-old neutered male cat lives in a small apartment with a single owner who works long hours away from home. There are no other pets. The cat will silently pounce on the owner’s hand when using the computer mouse at home. Which of the following is the most likely differential?
   a. Misdirected play aggression
   b. Fear-based aggression
   c. Redirected aggression
   d. Petting-induced aggression

6. Which of the following is a correct step for a treatment plan for owner-directed aggression?
   a. Ensure that indoor cats receive sufficient mental and physical stimulation.
   b. In case of redirected aggression, the owner should pet the cat to help calm it down when highly aroused.
   c. After the aggression triggers are identified, expose the cat to the triggers at high intensity for a prolonged period.
   d. If aggression to the owner is noted, throwing a pillow at the cat will teach the cat a lesson.

7. Which statement regarding reestablishing a positive relationship between owner and cat is correct?
   a. Unpredictable interactions improve the relationship between the owner and the cat.
   b. Interaction with cue-response-reward pattern benefits a positive relationship between the owner and the cat.
   c. Spraying water toward an aggressive cat is always recommended.
   d. If a cat won’t listen to the owner, the owner should force the cat into position to do the behavior that was commanded.

8. Which is an essential environmental enrichment tool for indoor cats?
   a. White noise machine
   b. Window film
   c. Scratching surfaces
   d. Tablet for interactive feline fishing games

9. Behavior modification for aggressive cats is primarily based on which of the following?
   a. Negative reinforcement and systematic desensitization
   b. Flooding and counterconditioning
   c. Counterconditioning and systematic desensitization
   d. Habitation and flooding
Curiosity saved the cat.

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