



## *Clinical Management of Feline Marking and Spraying Behaviors*

### **Vint Virga, DVM, Dipl. ACVB**

#### **Introduction**

Marking can be done with urine and feces. When urine is deposited on a vertical surface it is generally referred to as spraying. When urine is deposited on horizontal surfaces (generally small amounts), it can be marking as well. Middening (marking with feces) is uncommon in household cats but has been observed in free-ranging situations.

In contrast to urination for elimination purposes, with spraying and marking, cats often sniff the target area prior to marking, but do not smell the area after marking. Characteristically, a cat sniffs first then backs up, with tail vertical and quivering, and emits a stream of urine, directed caudally, toward a vertical surface. Some cats are observed to tread with their hind limbs. Spraying may also be done in a squatting position in which the cat is observed to make treading movements with the hindquarters prior to spraying accompanied by tail quivering. Both males and females can perform spraying, although it is more common in males - 10% of castrated males and 5% of spayed females are reported to spray. Spraying not only provides an effective means of communication in the establishment and maintenance of complex social hierarchies and territories, but also may serve to surround the cat with a familiar scent. This additional role may be related to why a cat may mark / spray indoors when anxious or when their territory is challenged by other cats. Anxiety in cats may result from changes in the social environment secondary to:

- Other cats (multi-cat household - spraying is often a sign of inter-cat aggression)
- Outdoor cats
- Changes in the household - new pet, baby, working schedule, new people

As with house soiling, accurate identification of all cats which are marking/spraying is critical for effective management. Fluorescein or brightly colored crayons administered orally may be used as markers to determine which cat(s) are spraying/marking or middening, respectively. A floor plan, observations of interactions between cats, and videotape are often critical elements in determining social interactions which may be predisposing to spraying, marking, and middening.

#### **Surgical Management**

A substantial decrease in marking has been demonstrated in 90% of intact male cats undergoing castration (Hart and Barrett, 1973). Ovariohysterectomy may similarly limit urine marking in 90% of intact female cats. Other surgical procedures, although not clinically recommended, have historically included olfactory tractotomy, medial preoptic lesion, and ishiocavernosus myectomy.

#### **Environmental Management**

Environmental modification may help to impact social relationships which may predispose cats to spraying/marking behaviors. Where an outdoor cat is implicated, visual and olfactory access to outdoor cats must be achieved. In some cases, confining indoor/ outdoor cats to an indoor lifestyle may diminish the need to mark inside the house; in other cases, this can exacerbate the problem of indoor marking. In temperate climates, a water sprinkler with an optical sensor (Scarecrow™) can effectively limit visual and olfactory access of visiting cats and other animals. Where this is not practical, Snappy Trainer™ Traps (safety mouse traps) or mothballs strategically placed outside the home may be effective. Window treatments such as shutters, blinds, and reflective films can limit visual access but may possibly allow some olfactory contact.

Because marking is one mode of olfactory communication, encouraging alternative means of olfactory communication may reduce the motivation for a cat to mark with urine and/or feces. Rubbing provides an opportunity for visual and tactile displays as well as a means for olfactory communication. Rubbing may also serve a role in exchanging odors. Skin glands utilized in rubbing behavior include interdigital, submandibular, perioral, temporal, and caudal glands. Coinciding with increased urine marking, intact males also rub more frequently than do anestrous females or juvenile cats.

Encouraging rubbing and rolling behaviors can facilitate olfactory communication other than with urine. Loosely sprinkled catnip placed strategically in socially significant sites can facilitate marking by means of rubbing and rolling. Other environmental facilitators include devices such as adhesive plastic combs (Kitty Korner Komer™ Self-Grooming Aid), sisal mats (Sisal Scratcher™) and scratching posts, and corrugated cardboard pads impregnated with catnip (Bizzy-Kitty Scratching Pads™).

Feliway®, a synthetic analog of one pheromone has been proposed to impact spatial organization and appeasing effects on social relationships (Pageat, 1996). Furthermore, as noted previously with loosely sprinkled catnip, Feliway® may reduce a cat's motivation to mark with alternate means. Although preliminary data appear promising, the efficacy of Feliway® in the management of urine marking has not been sufficiently evaluated by controlled clinical trials (Frank et al., 1999; Pageat, 1996; White and Mills, 1997) to accurately determine its clinical efficacy. The need to apply the product daily in the absence of household cleaners or deodorizers may compromise the appropriate application and efficacy of Feliway®.

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## PHARMACOLOGIC MANAGEMENT

Despite environmental and social management, pharmacologic support may be necessary to effectively address social factors which may predispose a cat to house soiling, spraying/marking, and middening.

Specifically considering marking behavior, progestins (e.g., megestrol acetate, medroxyprogesterone acetate) have been demonstrated to reduce marking behaviors primarily in males (50% of neutered males versus 10% of spayed females (Hart, 1980); however, the potential for adverse effects (i.e., bone marrow suppression, adrenocortical suppression, mammary hyperplasia, diabetes mellitus, gynecomastia, endometrial hyperplasia) preclude their use with the advent of modern psychotropic agents. Although the risk for serious adverse effects of benzodiazepines is low, the potential for fatal hepatic necrosis documented in select cases of oral diazepam administration commonly outweighs their potential benefit. Buspirone has been documented to reduce spraying and house soiling in a majority of cats (55% improved with 33% resolution) with substantially less risk of side effects than with the progestins and benzodiazepines (Hart et al., 1993).

Tricyclic antidepressants (TCA's) and SSRI's may be effective in anxiety based elimination and marking. For cases in which interstitial cystitis may be a contributory factor, amitriptyline and doxepin may be of particular value. The analgesic and antihistaminic properties of these TCA's may be of particular value for cases in which interstitial cystitis may be a contributory factor. Clinical practice as well as studies have demonstrated that clomipramine can be highly effective in the management of urine spraying/marking (Kroll and Houpt, 2001; Landsberg, 2001). Cyproheptadine, a serotonin antagonist, is notably less effective in managing spraying behaviors (Kroll and Houpt, 2001). Although SSRI's can be effective in the management of both house soiling and marking behaviors, no studies to date have been published documenting their efficacy.

### References

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*To make an appointment for a consultation with Dr. Virga, please call (401) 885-1163 and visit his website [www.behavmed.net](http://www.behavmed.net) to download the Behavioral History Form.*

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## Staff Spotlight ~ OSVS Reception Staff

I'd like to introduce our reception team or as we sometimes refer to them as our "front liners". These dedicated staff members have an extremely challenging and stressful position. Their responsibilities are quite varied and include greeting our clients and their pets, answering 10 incoming lines, booking appointments, filing, faxing, and processing all forms of payments. Their most challenging job how-

ever, is dealing with a myriad of client emotions. Our clients are generally not at their best, as their pet is either sick or injured; once you add financial limitations or concerns to the mix, it certainly makes for some tense moments. Our reception team tries very hard to be informative, respectful, supportive, and empathetic to all of our clients and should be commended for their efforts.



From left to right: Back Row—Lisa, Chelsea, Shannon F, Stephanie C, Shannon N, Stephanie D, and James.  
Front Row—Kathy, Bette, Michele, Sarah W, Sara C, Victoria and Morgan  
Missing from picture—Bill

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### *MRI services at OSVS*

OSVS continues to provide MRI services two days each week, although they will now be done on Tuesdays and Thursdays.

A routine MRI includes IV catheter +/- IV fluids, anesthesia and monitoring, MRI procedure (one major site), contrast injection, day stay in hospital, and MRI interpretation by our radiologist.

If you have any questions regarding this service, please feel free to call and speak with Dr. Sue Newell.

### **Emergency Veterinary Care Comes to the East Bay Area**

On November 1<sup>st</sup> we began seeing emergencies at Sakonnet Veterinary Hospital. We would like to thank Doctor Bill Condon and his staff for allowing us to provide after hours, weekend, and holiday emergency care out of Sakonnet Veterinary Hospital. Their generosity has enabled us to make emergency veterinary care available for your clients in the Bristol County area. We are currently undertaking construction on our own building located in Swansea, Massachusetts. Once construction is completed later this year, we will be operating that facility 24/7. We will keep you posted on our progress!