Special Report

Feline behavior guidelines from the American Association of Feline Practitioners

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The benefits of living with a pet are now well recognized. By preventing and treating behavior problems, veterinarians have the opportunity to protect and strengthen the human-animal bond and increase the quality of life for pets and pet owners. The goal of the American Association of Feline Practitioners Feline Behavior Guidelines is to support veterinarians by providing practical information that will help successfully incorporate feline behavior medicine into any practice that offers feline health care.

The Importance of Feline Behavioral Medicine in Veterinary Practice

Behavior problems are the most common cause of euthanasia in pet cats.[1] Behavior problems, including normal cat behavior that clients consider unacceptable, cause decreased quality of life for cats and their owners. Behavior problems may lead to family stress, inappropriate punishment of pets, destruction of the bond between people and pets, and relinquishment to shelters or euthanasia. There is evidence for an association between pet behavior and the level of owner attachment.[2] Most pets surrendered to shelters were evaluated by a veterinarian in the year prior to relinquishment.[3-5] Unresolved behavior problems cause veterinarians to lose approximately 15% of their client base annually.[6]

The belief that behavior is too time consuming to generate profit within the practice is a myth. Client education can be facilitated at all wellness appointments by reviewing educational handouts with clients. Fewer staff, less time, and fewer resources are needed to work with well-behaved patients. Training veterinary team members to educate clients about prevention of behavior problems has the potential to increase technicians' job satisfaction and allow veterinarians to use time more effectively.

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Preventive Behavioral Medicine

In cats, physical illness and pain are often recognized because of a nonspecific change in behavior. This information helps clients and veterinarians to detect disease or discomfort and monitor efficacy of pain management. Cat owners should be made aware of the need to contact the veterinarian if they see indications of anxiety, fear, or behavior that they consider to be unacceptable or changes from their cat's normal behavior.

Conducting a behavior assessment at every veterinary visit is important for prevention and early detection of behavior-related as well as medical problems (**Appendix 1**). Clients may not volunteer the information that the kitten bites or that the cat "misses the litter box occasionally" unless we specifically ask those questions. Clients often think that the cat is acting "out of spite" and are unaware that a veterinarian can help with these problems. If behavioral questions are not asked, clients will not know that the information is important, especially if they are unfamiliar with normal cat behavior.

A comprehensive history (including behavioral assessment), physical examination, and diagnostic testing are needed to differentiate between behavior-related and non–behavior-related conditions. For example, a cat that is urinating inappropriately could have feline lower urinary tract disease (interstitial cystitis) or arthritis that makes it difficult to get into the litter box. A cat with anorexia and lethargy may have an underlying medical problem or may simply be stressed by changes in its environment. In other situations, the cat may be stressed to the point that psychological effects are causing systemic disease.

Understanding normal behavior helps prevent problems—Many clients express concern about normal cat behaviors that the client finds unacceptable.

Educating clients about normal feline social and elimination behaviors, communication, and developmental stages provides them with realistic expectations. Understanding feline social and physical needs helps clients provide a better, more stimulating environment and reduces the chances of inappropriate elimination and scratching on surfaces other than scratching posts.

Without understanding what is normal, veterinarians cannot diagnose what is abnormal. It is important to determine whether the behavior is a normal behavior that the owner finds unacceptable, a truly abnormal behavior for the cat, or an inappropriate behavior that the client has inadvertently taught or reinforced in the cat.

Understanding normal social behavior and communication can help prevent aggression—Research has disproved the misconception that cats live as solitary creatures. The social organization of feline groups is quite different from that of canine groups. The feline social system is flexible, and cats may normally live alone or in groups.[7] Free-living domestic cats choose to live in social groups, called colonies, whenever sufficient food resources support multiple cats.[8-19,a,b]

Cats form social groups and have forms of communication that reflect their social behavior. Cats recognize individuals in their social group and have different interactions with different individuals (ie, preferred associate relationships).[20-22] Queens often engage in cooperative care and rearing of their kittens. There is also individual variation in the social behavior directed to other cats.[23]

Colonies are insular, and strangers are generally not welcome. Unfamiliar cats can be aggressively driven away. If a new cat repeatedly visits a group, it may eventually be integrated into the group in a process that typically requires several weeks.[24,b] Therefore, integrating a new cat, especially an adult, into an established group of cats should always be done gradually.

Within a group of cats, a social hierarchy can exist. When cats first establish relationships, overt aggression (eg, hissing, chasing, or swatting) may occur. Once the relationship is established, overt aggression is the exception as long as there are no environmental or physical changes. Social relationships can change throughout life. As with all social species, although the capacity to be social is inborn, specific social skills that result in an individual cat being a successful member of a group are learned.

Socialization is the process that promotes advantageous behavior changes as a result of exposure to people, other animals, and new environments. The sensitive period is the term used for the developmental stage when there is increased risk of developing fears and anxieties if the animal does not have the opportunity to experience and learn from social and environmental stimuli.[25] The primary socialization period of cats to people is from 3 to 9 weeks of age. Fear of people is inhibited by exposure to people during this period.[26] Socialization that occurs early, especially before 9 weeks of age, results in an increase in the kitten's willingness to approach and be held by people that persists into adulthood.[27] If cats are excluded from interactions with and handling by humans from 2 to 9 weeks of age, their risk of interacting poorly with humans in later life is increased.[28,29] Social learning occurs for many weeks after that period, with social play peaking at approximately 3 months of age (**Appendix 2**).

Genetic variables affect some aspects of temperament. For example, the offspring of bold fathers tend to be bolder than those of timid fathers and more likely to approach, touch, and rub humans.[30,31] Veterinarians should inform cat breeders about the importance of selecting for positive behavioral traits and exposing kittens to people during the sensitive period. A breed can benefit or be damaged by the degree to which cat breeders follow this practice.

Aggression

Aggression is a serious problem that can result in injury to other animals and people. In addition, zoonotic diseases can be spread from cats to people through aggressive acts. Although not a common client complaint, aggression is commonly seen in the form of play behavior in kittens. Asking clients about such behavior gives the veterinarian the opportunity to educate them to prevent play aggression. Understanding normal social behavior, body postures, and facial expressions in the cat can allow clients to recognize and prevent aggression.

Aggression caused by lack of socialization—There is increased risk of aggression toward humans if cats did not have human contact during the sensitive periods. Cats that are not handled until 14 weeks of age are more fearful and aggressive toward people, regardless of the circumstances.[28,29] Such cats do not voluntarily approach humans and are aggressive if they cannot escape. Socializing cats to a variety of people may prevent some forms of human-directed aggression. If possible, expose kittens to humans before the kitten is 7 weeks old. The queen should be present, provided she is not fearful. Cats handled for as little as 5 min/d from birth to 7 weeks of age are quicker to approach and solicit humans for interaction and play.

Handling by humans should be frequent, pleasant, and gentle. Handling should include basic health care procedures, including clipping claws, checking ears, and brushing teeth. If an adult cat has not been exposed to such handling as a kitten, start with very brief sessions. Reward the cat for cooperation.

Play aggression—Kittens often play roughly with other cats or kittens. The queen and other kittens teach the kitten to temper play. Cats that never learned to moderate their responses as kittens may play too aggressively with people. Instruct clients to use interactive toys (eg, a fishing pole toy with fabric or feathers at the end) instead of letting the kitten play directly with their hands or feet. Emphasize the need for adult supervision when children play with and handle kittens and cats; this supervision will prevent injury to all involved.

Aggression associated with petting—Some cats become less tolerant of petting as they become socially

mature. Cats with this condition actually solicit attention from people but tend to bite if petted for more than a few seconds. Such cats may have a form of impulse-control aggression.[32] Such aggression can be avoided if clients learn to give those cats attention in other ways, pet the cat for very short periods, or both.

Predatory behavior—Cats are hunters and will pursue prey even if not hungry. The best way to prevent predatory behavior is to raise kittens with potential prey animals (eg, pocket pets or birds).[32,33] Even if cats are not aggressive, clients should supervise them whenever they have access to potential prey. To prevent predation of wildlife, keep cats indoors, confine them to outdoor cat enclosures, or leash-walk them. Placing bells on the collars of free-roaming cats does not always prevent predation because cats can learn to stalk without the bell ringing.

Intercat aggression—A frequent client concern regards aggression between cats in the same household, although, unless there is evidence of wounds, clients may miss subtle signs of aggression. Aggressors can control access to food, litter boxes, resting and perching spots, and attention, and the victim usually becomes withdrawn. Both the aggressor and the victim may have inappropriate elimination or other undesirable behaviors.[31] Intercat aggression is most likely to occur when a new cat is introduced to a household, when a resident cat has been absent and returns to the home (eg, after a veterinary visit), and when there is competition for resources (eg, litter boxes, food, and resting areas).[34] Multiple resources should be provided and be easily accessible.

Pheromone products may help reduce aggression when unfamiliar cats are introduced to existing residents.[35] Although these products may be helpful as part of a complete behavior treatment plan,[36,37] they are not a substitute for social interaction and exposure.

Redirected aggression—A cat that is highly aroused by another cat or animal may redirect aggression toward anyone nearby. This victim could be another household cat with which there had been no previous problems or an unsuspecting family member. Never attempt to handle a cat in this aroused state because serious injury may result. If 1 cat is attacking another, a noise can distract or startle the attacker and interrupt the event. However, some cats will be rendered more aggressive by these stimuli, so caution is urged in using any disruptive stimulus. If cats must be handled while in this reactive state, covering with a blanket may allow safe handling.

Pain-associated aggression—Pain can cause aggression. A cat may attack an individual who causes pain (eg, a person combing over arthritic hips or brushing a painful tooth) or have lower tolerance because of preexisting pain. Because painful conditions such as arthritis, dental disease, intervertebral disk disease, meningioma, or injury often induce aggression, clients should be encouraged to consult a veterinarian if a cat becomes aggressive.

Understanding Normal Elimination Behavior

Inappropriate elimination is the most common client concern regarding cats. Client education about litter box care and normal elimination behavior is important for prevention and treatment of medical and behavioral problems. Early intervention offers the best chance to redirect the cat back into the litter box.

Cats voluntarily eliminate wastes in 3 ways: squat urination, defecation, and urine spraying. The typical housebound cat uses squat urination to pass relatively large volumes of urine twice daily. Defecation is the method by which the cat eliminates solid wastes; some cats also use defecation as a means of communication.[10] House cats typically defecate once daily.

Cats choose elimination sites within their territory based on social interactions, previous site use, and surface preference or aversion. High-ranking, free-ranging cats may control access to preferred elimination sites; this pattern may also play a role for indoor cats in situations in which social systems are stressful.[38] Easy access to litter boxes in places where cats will use them will help prevent inappropriate elimination in multiple-cat households.

Most cats prefer a fine-grained substrate.[39] For indoor cats, the cleanliness of the litter box correlates with a return to litter box usage in cats with elimination problems. Research indicates that house cats without elimination problems will dig in their litter boxes longer before eliminations, whereas cats that dig for 4 seconds or less prior to elimination may be candidates for elimination problems.[a] Making clients aware of this can help identify a potential problem with litter box aversion so that they can change to a litter that cats prefer (ie, dig in for longer than 4 seconds).[a] Cats also spend more time in litter boxes that are at least 1.5 times the length of a cat's body.[a] Commercial litter boxes are often too small, but there are a number of options that can be used instead.

Although squat urination is the method by which most cats empty the bladder, cats may start in a squatting position and finish in a standing position. Some cats also eliminate urine in a standing posture called spraying. Spraying is a normal feline behavior, although humans find it objectionable. Spraying is not a primary means of urine elimination in most cats; feline communication may be its main function. Both male and female cats spray, although males and estrous females spray more often. The cat does not dig before spraying, nor try to cover the affected area afterwards. When spraying, the cat usually voids small volumes of urine onto vertical surfaces. The cat may also posture to spray without releasing urine.

Spraying can be viewed as a passive form of aggression and as a method by which an intact resident male advertises its presence and activity. Cats from multiple-cat households are more likely to spray than those from single-cat households.[40]

Client education about litter box care should come from veterinary professionals. Clients should also be made aware that inappropriate urination or defecation often accompanies an underlying medical condition and does not occur "to get back at the owner."

Scratching

Scratching is an innate behavior of cats.[30,41] Scratching serves to groom the front claws as well as to leave visual or olfactory markers. Cats may also scratch to stretch their muscles.[42]

Nail care and proper training can prevent scratching damage in the home. Clients should recognize that scratching is a normal cat behavior but can be directed at appropriate surfaces. Many cats prefer vertical scratching posts, although some prefer horizontal posts. Vertical scratching posts must be sturdy and tall enough for the cat to stretch. Scratching materials preferred by most cats are wood, sisal rope, and rough fabric. Scratching posts should be located near areas such as windows or sleeping areas, as cats often stretch and scratch upon awakening.

Training to scratching posts when the kitten or cat is first introduced to the home helps prevent undesirable scratching. This can be done by enticing the cat to the scratching post upon awakening, rubbing catnip on the post, and holding treats or toys part-way up the post to encourage stretching and scratching.[42] If the cat is already scratching in an undesirable area, the client should be queried to determine whether the cat prefers vertical or horizontal objects and what type of material seems preferred so that clients can make or purchase posts of similar fabrics. Placing double-stick tape on areas formerly used by the cat and rewarding use of the post help direct the cat to the post. If necessary, the cat can be confined to an area where it has a scratching post or posts and cannot scratch objects that clients consider undesirable.

Nail trimming is accepted by most cats if done correctly. Plastic nail caps may be used for cats that are easy to handle.[42] Declawing is highly controversial and should only be considered as a last resort. Client education about all options provides information regarding preferred alternatives. The American Association of Feline Practitioners has published an online statement regarding declawing of cats.[43]

Feeding and Ingestive Behavior

An understanding of cat nutrition requires familiarity with the unique nutritional needs of the cat and normal feeding behavior. Domestic cats share many feeding behaviors with their wild counterparts. Cats typically eat 10 to 20 small meals throughout the day and night.[11,44] Small rodents comprise 40% or more of the diet of feral domestic cats; however, a mouse only provides 30 kcal, or 8%, of the daily energy requirement of an adult cat.[45,46] Repeated cycles of hunting throughout the day and night are required to provide sufficient food for a typical cat. Domestic cats usually have similar ingestive behavior, making multiple small food acquisitions throughout a 24-hour period.[45]

Predatory behaviors are well developed; cats will stop eating to make a kill.[47] This behavior allows for multiple kills, which optimizes food availability. This behavior and others may surprise clients who confuse predatory behavior with hunger. If the cat is already a hunter, supplemental feeding may reduce time spent hunting but does not alter hunting behavior.

Obesity in cats is an important health concern. Feeding methods should simulate normal feeding behavior, including ways to allow cats to hunt for their food. This increases exercise during feeding time, which decreases boredom and helps with weight management. Suggestions include hiding dry kibble around the house, using puzzle cubes for feeding, and tossing kibble so cats can chase after the food as they would prey. Food can also be used as a reward for performing tricks and obeying word or clicker commands (eg, sit or come), but this food should be accounted for in dietary calculations.

Picky eaters—Adult cats fed highly palatable, single-item foods may develop a fixed reliance on 1 food,[48,49] leading to refusal of other foods if a dietary change is needed because of health problems or discontinuation of a product. Cats should be exposed to various flavors, textures, and shapes of food. Feeding both canned and dry food to cats is acceptable.

Many cats will not eat food in which medications are mixed. If clients cannot administer medications orally, a pill hidden in a small ball of canned or semimoist food and offered away from the main meal helps prevent the cat from associating the medication with feedings. If medications must be administered in food, place the medicated food in a bowl away from the regular feeding area. Food can be enhanced with tuna or salmon juice, baby food (without onion powder), or meat drippings.

Cats should not abstain from eating for longer than 24 hours (less in kittens). A veterinarian should be contacted if appetite is poor for more than 48 hours. In a multiple-pet household, it may be difficult for clients to recognize appetite changes in an individual cat; veterinarians often find that cats have lost substantial body weight when clients report the cat to have only missed a few meals.

Obesity—Changing the behavior of both pets and people is important in preventing obesity. Encourage clients to show love to their cats by giving positive attention, not food. The amount of food should be calculated and measured out to prevent overeating. There is a 2-fold difference in energy requirements between active and sedentary cats. Food intake must be adjusted according to the cat's activity level to maintain optimal body condition.

Calculation of the daily energy requirements for each cat determines accurate food quantities. The daily energy requirements value is a multiple of the **resting energy requirement** (**RER**), where RER (kcal) = 70 × body weight (kg)$^{0.75}$. The following general multipliers of the RER may be used for adult cats:

Neutered cat: 1.2 × RER (60 kcal/kg)
Sexually intact adult cat: 1.4 to 1.6 × RER (70 to 80 kcal/kg)
Inactive cat: 0.8 to 1.2 × RER (40 to 60 kcal/kg)
Obese-prone adult cat: 0.8 to 1.0 × RER (40 to 50 kcal/kg).

Obese cats may require as few as 0.8 × RER (40 kcal/kg of ideal body weight) to achieve a mean weight loss of 1% of body weight per week.[45] Weight loss should be monitored every 2 to 3 weeks initially. Neutering reduces the daily energy requirements of adult cats by

24% to 33%[45]; nutritional counseling should be provided to clients at the time of neutering to provide information about reduced caloric requirements.

Multiple cats—Having at least 1 food bowl/cat in the household will avoid food guarding and hierarchical interactions. Multiple feeding stations and individual food dishes, especially if put at multiple levels and in quiet hiding spots, allow timid cats a secure place to eat apart from more dominant cats. Assertive cats also benefit by having more time to eat quietly in a social environment that they do not have to control. Cats with specific nutritional requirements may need to be fed separately from others.

Food aversion—Cats may develop learned aversion to certain foods when feeding is paired with a negative gastrointestinal experience.[45] Also, cats can develop a food aversion to a food they were eating when they developed other illnesses or were force-fed.

Dietary changes—Dietary changes should be made gradually by increasing the amount of new food over a period of several days while gradually decreasing the amount of the old food. The cat can be encouraged to eat a new diet by adding small amounts of another food that the cat likes, such as baby food (without onion powder), chicken drippings, tuna or clam juice, or garlic powder. Cats should not be starved into eating a particular food because important health problems can result from anorexia. If a cat refuses to eat a recommended diet, consumption of a less appropriate diet is preferred to having the cat go for prolonged periods without eating.

Learning in Cats

Like other animals, learning in cats involves a change in brain molecular chemistry, resulting in long-term modification. Acceptable and unacceptable behaviors are both learned. Once a behavior is learned, it is difficult to reverse. It is easier for animals to learn an appropriate behavior than to stop performing an inappropriate behavior.

Cats can be taught a variety of tricks by use of clicker training and food or toy rewards. Encouraging and rewarding positive behavior are the best ways to train a cat. Undesired behavior should be ignored or redirected. Initially, for rewards to work, they should be given immediately and consistently. After the desired behavior is learned, rewards should only be given intermittently.[50,51] Cats appear to enjoy the attention and stimulation associated with training.

Cat communication—Cats communicate through visual, tactile, olfactory, and auditory means. Visual signaling includes body posture (**Figure 1**); tail, ear, and head position; and willingness to make eye contact (**Figure 2**). Tactile communication includes rubbing against others, including people; grooming; and nose touching, which is used as a greeting. Auditory communication includes purring, which occurs primarily during contact with another individual. The trill (or chirrup) and meow are used as greeting calls. Because cats have such a keen sense of smell, olfactory communication is

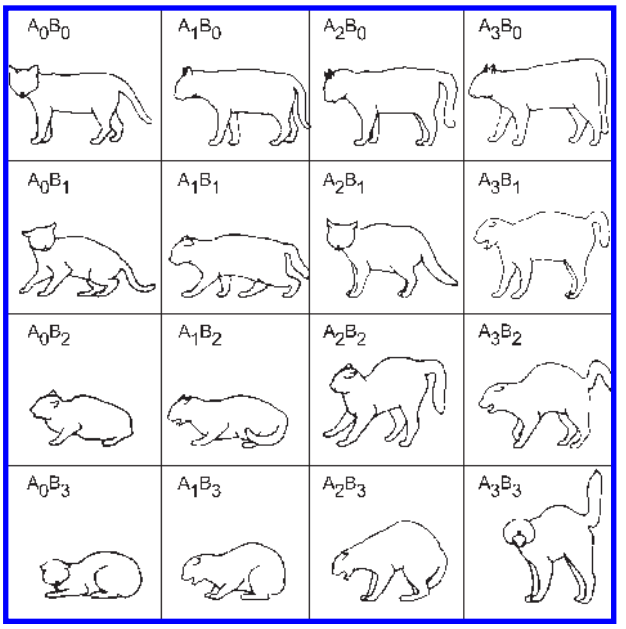

Figure 1—Illustrations of body postures of cats. Notice that in the series from A_0B_0 to A_3B_0, the cat becomes more offensive, whereas the cat becomes more defensive in the series from A_0B_0 to A_0B_3. A_3B_3 represents a cat with defensive and offensive behaviors. A_0B_0 represents a calm cat. A_3B_0 represents the most aggressive cat in an offensive, assertive sense; this is a cat clients will want to watch in situations involving profound intercat aggression or unprovoked aggression against humans (from Overall[63] [Adapted from Leyhausen P. *Cat behavior: the predatory and social behavior of domestic and wild cats.* New York: Garland STPM Press, 1979. Used with permission]).

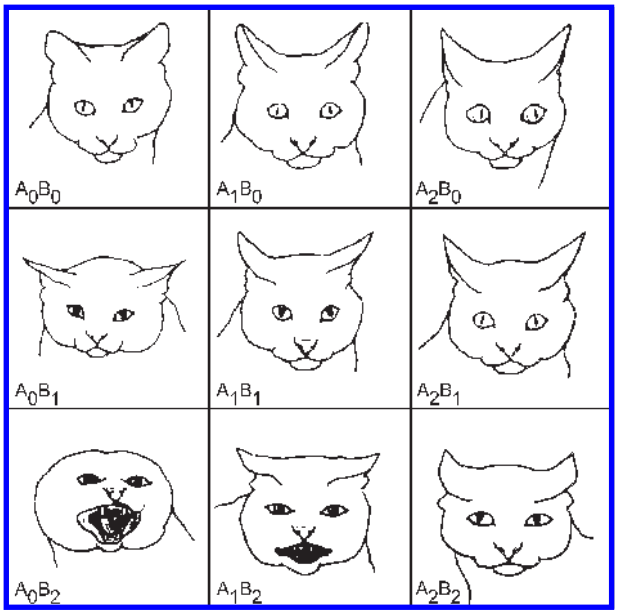

Figure 2—Illustrations of facial expressions of cats. Notice that in the series from A_0B_0 to A_2B_0 the cat becomes more reactive, whereas fear and an increased unwillingness to interact are more pronounced in the series from A_0B_0 to A_0B_2. The diagonal from A_0B_0 to A_2B_2 represents a cat that is becoming more offensive and assertive. More offensive postures are characterized by postures above the diagonal, whereas more defensive behaviors are characterized by the postures below the diagonal. A_0B_0 represents a calm cat (from Overall[63] [Adapted from Leyhausen P. *Cat behavior: the predatory and social behavior of domestic and wild cats.* New York: Garland STPM Press, 1979. Used with permission]).

very important. Olfactory communication in the form of fecal or urine marking or spraying is often—but not always—normal behavior that clients find unacceptable.

Preventive Behavioral Medicine at the Veterinary Clinic

Incorporation of preventive care into practice education programs, preadoption counseling, kitten classes, or wellness appointments results in clients with calmer, healthier cats.

Preadoption counseling—Preadoption counseling helps veterinarians ensure that a client has realistic expectations about the time commitment and expenses involved in owning a cat. Home care includes giving positive attention, play, training, and litter box maintenance; expenses include food, litter, toys, scratching structures, and veterinary care.

Evaluating the temperament of the cat is an important part of an assessment. Understanding body postures (Figure 1) and facial expressions (Figure 2) can help clients choose confident, friendly cats. Because some shyness in cats is genetic,[30] clients who desire an outgoing cat should observe or interact with prospective kittens long enough to learn whether the kitten's personality is likely to meet their needs. Pathologically shy kittens can improve but may never be normal. Clients may not know the early history of their kittens, but if the kittens were feral for the first 3 months of life, clients should be informed that the risk of pathologic anxiety is increased.[52]

Choosing between a kitten and an adult cat depends on the human family. Adult cats pose less zoonotic risk than young cats, making them a better choice for older people, immunocompromised individuals, and families with very young children. Kittens are a good choice for households with time to socialize appropriately and regularly with the kitten. If veterinary expense is a consideration, care for a healthy adult cat is usually less costly than for a kitten. Educate clients to choose kittens or cats that appear healthy and sociable, rather than choosing a cat on the basis of looks or feelings of pity. If clients decide to rescue a special-needs cat, they should be educated regarding potential consequences.

One benefit of purchasing a pedigreed kitten is the ability to evaluate the parents. An association between temperament and genetics has been established.[30] A kitten is more likely to have good social behavior if left with its mother and siblings until 8 weeks of age in an environment with exposure to humans. Adopting a queen with her kittens provides maximum social stability and opportunities for learning for the kittens. Adult cats that remain with their siblings spend more time together than nonlittermates.[23]

Removing a kitten from its mother prior to 6 weeks of age is not desirable. Kittens separated from their mothers at an early age are more likely to be suspicious or aggressive.[53] Properly raising orphaned kittens is a labor-intensive job that should not be undertaken lightly. To prevent future behavior problems, people who are knowledgeable in tempering play behavior should handle such kittens.

Pleasant veterinary visits for cats—Creating pleasant veterinary visits for cats helps prevent stress and potential injury for the client, patient, and veterinary team members. Clients do not care how much we know until they know how much we care—in other words, most clients cannot judge a veterinarian's knowledge of feline medicine, but they can judge the ability to handle the cat confidently, respectfully, and effectively. Clients are more willing to obtain regular veterinary care, including more extensive preventive and therapeutic care, if the visits are pleasant. Calm, relaxed cats enable veterinarians to perform thorough physical examinations and enable clients to better focus on recommendations. Even fearful cats can be examined with minimal stress and are often calmer and easier to work with if at least part of the examination is done within the carrier.

First veterinary visits—To allow sufficient time to educate clients regarding prevention of behavior problems in their new kittens, provide information over the course of a few visits or during kitten classes (**Appendix 3**). Handouts or reading material are recommended to supplement the information provided and to improve the clients' ability to retain the material. Client education should include aspects of normal cat behavior, socialization, training, and home maintenance (**Appendix 4**).

Kitten classes—Kitten classes effectively establish the veterinary team as a primary resource for information about cats and distinguish a veterinary practice from others in the area.[50,54] Kitten classes provide an opportunity to educate clients about cat behavior and health needs in 2 or 3 enjoyable sessions. Classes help dispel the myth that cats can't be trained and give clients skills needed for shaping desirable behaviors in the cat.

Classes help clients avoid common behavioral and medical problems and create realistic expectations about normal cat behavior.[55,56] An added benefit is the ability to educate all family members or several clients at once, reducing the time needed for first veterinary visits. The classes also allow kittens to play together and be exposed to different people. Such exposure helps the kitten better adapt to changes that may occur in the family and home environment, setting the stage for a lifetime without fear of noises, people, places, or experiences. Kitten classes also allow for identification of emerging problems so that they can be addressed as they arise. Participating kittens gain confidence as they travel regularly in the car, play with other kittens and toys, and broaden their life experiences. Attending classes in the veterinary hospital allows for positive associations with the hospital.

Classes should be open to kittens from 7 to 14 weeks of age.[50] Inviting all family members promotes consistency of care. Class size should be limited to 3 to 8 kittens to allow for effective socialization and training. Kittens should have received at least 1 vaccination against feline viral rhinotracheitis virus, calcivirus, and panleukopenia virus at least 10 days prior to the first class,[c] a first deworming, and negative results of a recent FeLV/FIV test. Kittens with upper respiratory tract infection, FeLV, FIV, ringworm, or other contagious conditions should not attend.

Preventing Harmful Stress in Cats Prevents Behavioral Problems

Exposure to strongly fearful or aversive events can create long-term neurochemical changes and associations that trigger fearful responses for years. The more extreme the fearful response, the more likely it is that future fearful behavior will be facilitated. Evaluation for behavioral problems requires assessment of the factors in the environment that could be causing harmful stress.

Some level of stress or provocation is necessary to develop pliant neuroendocrine and behavioral responses. An important component of preventive medicine is teaching clients to recognize harmful stress. Examples of harmful stress[57] include irregular and unpredictable feeding times, irregular and unpredictable cleaning of litter boxes, absence of stroking and petting or other positive interactions with humans, unpredictable and unfamiliar manipulations or handling, changes in social environment (eg, new baby, spouse, or roommate or change in client's work schedule), changes in physical environment, lack of mental stimulation, startling stimuli such as loud noises, and lack of choices or control over situations (behavioral entrapment).

Common indicators of feline stress, anxiety, or fear include decreased grooming, decreased social interaction, decreased exploration or play behavior, greater proportion of time spent awake (eg, exhibiting vigilance and scanning behavior), increased hiding, decreased frequency and success of mating behaviors, chronic withdrawal and signs of depression, and alterations in appetite (eg, anorexia or overeating).

Protection from fear and stress—The cat's emotional needs for social companionship and mental stimulation should be met, and exposure to unpleasant situations should be minimized. It must also be recognized that lack of mental and physical stimulation is stressful.[58]

Provide the cat with coping tools—Stress is greater when an animal has limited options for environmental control. Problems can be minimized if clients can prevent situations that cats may find stressful (eg, having to share a litter box). Choices provide a measure of control for the cat. For example, in a multiple-cat household, placement of several stations throughout the home with litter boxes, food, and water allows cats to interact with or avoid other cats. Providing areas for concealment reduces stress,[57,59] as hiding is an important coping mechanism for cats in stressful environments. Strategically placed crates, boxes, open closet doors, and climbing trees can all serve as retreats for cats. Hiding can be particularly helpful for caged cats and can be facilitated by simply providing a cardboard box in the cage.

Clients who play with and groom their cats and who maintain a predictable but flexible routine for feeding decrease background stress. For example, 10 minutes of daily, reliable interaction can help a sociable cat deal with being ignored after the arrival of a new baby. When unpleasant stimuli are predictable (eg, they have a known outcome with a beginning and end), they are less problematic. Unpredictability of stressful stimuli renders the stimuli more stressful.[60,61]

Environmental enrichment—Providing an enriched environment will prevent many potential behavior problems that occur secondary to understimulation or stress. In situations where behavior problems have already developed, environmental enrichment is an important component of the treatment plan. Educating clients and providing suggestions on how to improve the environment can usually prevent stress and subsequently improve the quality of life for feline pets.

Predictability—Clients should feed the cat after a particular event (eg, after the morning shower and before dinner) so that the cat can rely on some pattern of response. Clients should not feed cats upon awakening because cats may learn to wake people for food. A routine should be established for litter box care that includes scooping boxes twice daily. Although cats like predictability, small, regular changes in the environment teach coping skills, provide novelty, and prevent boredom. For anticipated changes in the family, such as adding a new pet or baby, prepare the environment and gradually introduce the cat to these changes.

Companionship—Social companionship can take the form of gentle petting and stroking,[62] feeding, grooming, and play. If cat owners are away for a large part of the day, the cat may benefit from having another cat as a companion.

Aging and Changes in Behavior

Changes in behavior are common in older cats and are often associated with underlying medical problems. The incidence of behavior problems increases with advancing age.[d] Once the underlying cause is identified, many behavior problems in older cats are correctable. To promote early detection and prevention of both medical and behavior concerns, semiannual examinations are recommended for cats 7 years of age and older.[46,63,64] Age-appropriate diagnostic testing once or twice every year may identify conditions that can lead to medical or behavioral problems. If behavioral changes are detected, a thyroid panel (ie, determination of total and free thyroxine concentrations) is recommended.[65,66] Bacteriologic culture of urine is recommended if urinalysis reveals that the urine is dilute (specific gravity < 1.035) because dilute urine can predispose to urinary tract infections and infections may exist without evidence of infection in urinary sediment.

Hyperthyroidism, hypertension, chronic renal disease, and diabetes mellitus are common conditions of older cats that are often accompanied by behavioral abnormalities. Pain-associated conditions such as dental disease and arthritis can also affect behavior. A decline in hearing and vision are normal aging changes that may affect behavior and can lead to subsequent fear, phobias, or aggression.[67] Altered sleep-wake cycles are also common in older cats, with wandering and increased vocalization, especially at night. Causes include cognitive dysfunction, hypertension, pain, and

sensory decline. Clients should be educated to interpret even minor behavioral changes as a potential sign of disease and to consult a veterinarian if observed.

When behavior problems occur secondary to a medical problem, it may be insufficient to treat only the underlying medical condition. The treatment plan may include environmental management, behavior modification techniques, and behavior-altering drugs (**Appendix 5**). Simple environmental modifications can make daily activities much easier for older cats. These include quiet, safe sleeping spots; nonskid surfaces; and ramps or steps to reach places where they can no longer jump.

In cats with polyuria, clumping litter may dry into concretions on the paws; avoid use of clumping litter in these cats. Night-lights can be left on to help cats with visual decline find litter boxes in the dark.

Principles of Behavior Treatment

Obtain a history—At every visit, clients should be asked questions relating to behavior (Appendix 1). This enables early detection of problems and ensures that good prophylactic behavior strategies become part of the client's repertoire. Follow-up questioning is needed for each behavior concern noted previously.

Make a diagnosis—A working diagnosis is mandatory to develop a behavior treatment plan. Diagnosis requires integration of a good history, comprehensive physical examination, and diagnostic testing to identify medical problems that may influence the behavior. If it is not possible to make a working diagnosis, consultation with or referral to a veterinary behaviorist is recommended.

Educate clients—Clarify the client's understanding of what normal behavior should be for their cat, taking into account age, breed, and environment. Also, clarify client expectations and compare these with likely outcomes.

Modify the environment—Change the cat's social environment. This can be implemented by increasing the time the client spends focused on the cat and may include teaching tricks, active play, or quiet time with the cat. The routine should be reliable but not inflexible. The addition, separation, or rehoming of other cats may be warranted in some instances. Encourage normal, desirable behavior (eg, exploring, chasing or stalking toys, or relaxing quietly) with rewards (eg, treats, praise, or petting).

Change the physical environment. Start by keeping the cat in an environment that does not trigger the behavior. This may involve a separate room, restricting access to the room in which the behavior occurs, using crates or kennels, completely changing the environment (eg, providing outdoor cat enclosures), increasing vertical spaces (eg, climbing trees or shelves), or improving scratching areas.

Change behaviors and teach new, appropriate behaviors—Behavior modification simply is the use of the principles of learning to change behavior. Cats learn best by being rewarded. Punishment does not teach the desired behavior. In addition, punishment used incorrectly typically makes cats more distressed and is likely to encourage cats to be more fearful and reactive to the client.

Rewards should be given as soon as possible during the behavior. The best way to do this is to watch for early signals that the behavior will happen. Watching for precursor behaviors (eg, sniffing and approaching the post) allows for an instantaneous reward of a food treat or toy when the cat scratches on the post.

New behaviors are learned best if they are rewarded every time they occur and subsequently rewarded intermittently once learning has been established. For intermittent rewards to maintain a behavior, the behavior must be truly learned; otherwise, the cat learns random associations. For example, every time the cat uses a new scratching post, it should be given a treat until the scratching post is consistently being used. Once the cat uses only the post and not the furniture, the client should encourage this behavior pattern by rewarding the cat a few times per week.

Passive interventions—The easiest passive intervention is to ignore the undesirable behavior, as long as medical problems that could cause the behavior have been ruled out or treated. For example, if the cat meows to be fed at 3:00 AM and the client complies, the cat is inadvertently rewarded with food and attention. This teaches the cat an undesirable behavior that may contribute to obesity and decrease the quality of the relationship between pet and client. Clients should ignore the cat completely when it meows in the night, even if this means banning the cat from the bedroom until the habit is broken. A few initial rough nights may prevent a prolonged behavior concern.

Active interventions—The most effective active intervention is to disrupt the behavior every time it occurs. In many cases, ignoring the undesirable behavior while rewarding only desirable behaviors is preferable. Disruption is effective only if it occurs every time that the behavior occurs and at the start of or during the performance of the behavior. This means that it is effective only for those behaviors that are not self-reinforcing and that do not occur in the client's absence. Disruption should be sufficiently aversive to stop the behavior (eg, a loud whistle or shaking a can of coins) without causing damage to the human-animal bond. The cat must not be scared or hurt by the client. The best disruptive stimulus will not be the same for every cat. After interruption of the behavior, the client should encourage another behavior to replace the interrupted one. For example, if the cat begins to scratch the sofa and is interrupted, the client can gently take the cat to the post and scratch it; the cat may follow suit and be rewarded. For this to work best, the cat cannot have access to the sofa in the client's absence.

Active interventions can also redirect the cat to an alternate behavior. For example, if the cat meows every time a person goes near the refrigerator, instead of feeding the cat, a favorite toy can be thrown for the cat. If the person always throws a toy, the cat will learn to substitute play for begging. The key is to ensure that clients meet the cat's needs while decreasing the cat's unwanted behavior.

Medication—A variety of medications (Appendix 5) are available to help with behavior problems. Medication should be used only as part of a treatment program that includes environmental management to prevent the behavior triggers plus behavior modification to teach appropriate behaviors. Most medications presently recommended, particularly the **tricyclic antidepressants (TCAs)** and the **selective serotonin reuptake inhibitors (SSRIs)**, enhance new learning, both associative and operant, so their use without environmental and behavior management is unlikely to be effective. A diagnosis should be made before medication is prescribed; medication decisions should not be based on clinical signs alone. Diagnostic testing is important to rule out the common medical problems that manifest initially as behavior problems. Testing may also identify contraindications to the usage of certain behavior-altering drugs. Most behavior-altering drugs are metabolized through renal and hepatic pathways; follow-up laboratory evaluation is necessary to ensure that medication-associated organ damage does not occur.

Choice of medications—Although the effects of SSRIs (eg, paroxetine [Paxil] or fluoxetine [Prozac]) can be detected within the first week in cats, full efficacy of treatment may not become clear for 4 to 6 weeks. Most cats require drug treatment for an extended period of time; quick fixes are rare. The initial antianxiety effects of TCAs (eg, amitriptyline or clomipramine) are seen after 5 to 7 days, and more profound changes may be seen with additional time. Treatment for a minimum of 4 to 6 months is recommended to improve problem behavior.[68]

It should be emphasized to clients that medication works with and does not replace behavior modification. After the behavior has been modified, attempt to gradually discontinue medication by tapering doses (**Appendix 6**). If the behavior worsens, the medication can be increased again.

Discontinue medications immediately if signs of toxicosis occur. Older cats can be particularly susceptible to the adverse effects of behavior-altering drugs, which can include sedation, constipation, and hypotension. Lower doses or a longer dosing interval may decrease the risk of adverse effects in older cats. Do not combine monoamine oxidase-inhibitors such as selegiline with any SSRI or TCA drug because this combination leads to potentiation of serotonin and norepinephrine activities. Such combinations can lead to serotonin syndrome—an iatrogenic condition characterized by hyperactivity, anorexia, insomnia, tachypnea, tachycardia, and potentially death. Severe adverse effects are rare with the newer medications when they are used appropriately. Atypical reactions can be profound and may manifest as profound signs of depression or excitation.[68,69] In the event of an atypical response, support, including administration of IV fluids, is required and is generally successful.

Administering medication—To prevent difficulties with administering medications, teach clients how to handle the cat's mouth and give medications as part of routine handling (eg, in kitten classes or during first veterinary visits). Many drugs are bitter and have an objectionable taste but most can be repackaged in capsules to minimize problems associated with taste. Oral administration of tablets or capsules (especially doxycycline) with 6 mL of water to enhance swallowing of the medication decreases risk of gastroesophageal disease and ensures rapid delivery of the medication to the stomach.[70] One should not expect psychopharmacologic agents to have the same effects when administered transdermally versus orally. The active metabolite of fluoxetine has a long elimination half-life, which may cause adverse effects in transdermal applications.

When to refer—As with all specialties, it is the veterinarian's responsibility to refer if expertise is needed beyond what the veterinarian is able to provide. Behavior problems are often life-threatening conditions, deserving the same importance and expertise as other life-threatening conditions. A listing of board-certified specialists can be found in the AVMA Directory[71] or by contacting Dr. Bonnie Beaver, executive director of the American College of Veterinary Behaviorists, at bbeaver@cvm.tamu.edu.

Most major continuing education meetings feature behavior courses. Practitioners can also take intensive courses in behavior through the North American Veterinary Conference Post-Graduate Institute[72] and the Post-Graduate Foundation of the University of Sydney, Australia.[73] Membership in the American Veterinary Society of Animal Behavior provides newsletters, a membership directory with names of individuals who either have a special interest in behavior or are board-certified in behavior, and an online forum for questions and comments.[74]

a. Sung W. *Effect of gender on initiation of proximity in free ranging domestic cats* (*Felis catus*). MS thesis, Department of Anatomy, College of Veterinary Medicine, University of Georgia, Athens, Ga, 1998.
b. Wolfe R. *The social organization of the free ranging domestic cat* (*Felis catus*). PhD dissertation, College of Veterinary Medicine, University of Georgia, Athens, Ga, 2001.
c. Schultz R. School of Veterinary Medicine, University of Wisconsin, Madison, Wis: Personal communication, 2004.
d. Moffat K, Landsberg G. An investigation into the prevalence of cognitive dysfunction syndrome (CDS) in cats (abstr). *J Am Anim Hosp Assoc* 2003;39:512.

References

1. New J, Salman MD, King M, et al. Characteristics of shelter-relinquished animals and their owners compared with animals and their owners in US pet-owning households. *J Appl Anim Welf Sci* 2000;3:179–201.
2. Serpell JA. Evidence for an association between pet behavior and owner attachment levels. *Appl Anim Behav Sci* 1996;47:49–60.
3. Hetts S, Heinke ML, Estep DQ. Behavior wellness concepts for general veterinary practice. *J Am Vet Med Assoc* 2004;224:506–513.
4. Scarlett JM, Salman MD, New JG, et al. Reasons for relinquishment of companion animals in US animal shelters: selected health and personal issues. *J Appl Anim Welf Sci* 1999;2:41–58.
5. Scarlett JM, Salman MD, New JG, et al. The role of veterinary practitioners in reducing dog and cat relinquishments and euthanasias. *J Am Vet Med Assoc* 2002;220:306–311.
6. Patronek GJ, Dodman NH. Attitudes, procedures, and delivery of behavior services by veterinarians in small animal practice. *J Am Vet Med Assoc* 1999;215:1606–1611.
7. Beaver BV. *Feline behavior: a guide for veterinarians.* 2nd ed. Philadelphia: WB Saunders Co, 2003.
8. Dards JL. Home ranges of feral cats in Portsmouth Dockyard. *Carn Genet Newsl* 1978;3:242–253.

9. Dards JL. The behaviour of dockyard cats: interactions of adult males. *Appl Anim Ethol* 1983;10:133–153.

10. Macdonald DW, Apps PJ. The social behaviour of a group of semi-dependent farm cats, *Felis catus*: a progress report. *Carn Gen Newsl* 1978;3:256–268.

11. Macdonald DW. The ecology of carnivore social behaviour. *Nature* 1983;301:379–384.

12. Natoli E. Spacing pattern in a colony of urban stray cats (*Felis catus* L.) in the historic center of Rome. *Appl Anim Behav Sci* 1985;14:289–304.

13. Natoli E. Behavioural responses of urban feral cats to different types of urine marks. *Behaviour* 1985;94:234–243.

14. Kerby G, Macdonald DW. Cat society and the consequences of colony size. In: Turner DC, Bateson P, eds. *The domestic cat: the biology of its behaviour.* Cambridge, UK: Cambridge University Press, 1988;67–81.

15. Natoli E, De Vito E. Agonistic behaviour, dominance rank and copulatory success in a large multi-male feral cat colony (*Felis catus* L.) in central Rome. *Anim Behav* 1991;42:227–241.

16. Mirmovitch V. Spatial-organization of urban feral cats (*Felis catus*) in Jerusalem. *Wildl Res* 1995;22:299–310.

17. Yamane A, Doi T, Ono Y. Mating behaviors, courtship rank and mating success of male feral cat (*Felis catus*). *J Ethol* 1996;14:35–44.

18. Macdonald DW, Yamaguchi N, Kerby G. Group-living in the domestic cat: its sociobiology and epidemiology. In: Turner DC, Bateson P, eds. *The domestic cat: the biology of its behaviour.* 2nd ed. Cambridge, UK: Cambridge University Press, 2000;95–118.

19. Natoli E, Baggio B, Pontier D. Male and female agonistic and affiliative relationships in a social group of farm cats (*Felis catus* L.) *Behav Processes* 2001;53:137–143.

20. Crowell-Davis SL. Social behaviour, communication and development of behaviour in the cat. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine*. Gloucester, England: British Small Animal Veterinary Association, 2002;21–29.

21. Curtis TM, Knowles RJ, Crowell-Davis SL. Influence of familiarity and relatedness on proximity and allogrooming in the domestic cat (*Felis catus*). *Am J Vet Res* 2003;64:1151–1154.

22. Crowell-Davis SL, Curtis TM, Knowles RJ. Social organization in the cat: a modern understanding. *J Feline Med Surg* 2004;6:19–28.

23. Bradshaw J, Hall SL. Affiliative behaviour of related and unrelated pairs of cats in catteries: a preliminary report. *Appl Anim Behav Sci* 1999;63:251–255.

24. Macdonald DW, Apps PJ, Carr GM, et al. Social dynamics, nursing coalitions and infanticide among farm cats, *Felis catus*. *Adv Ethol* 1987;28:1–64.

25. Bateson P. How do sensitive periods arise and what are they for? *Anim Behav* 1979;27:173–180.

26. Bradshaw J, Horsfield GF, Allen JA, et al. Feral cats: their role in the population dynamics of *Felis catus*. *Appl Anim Behav Sci* 1999;65:273–283.

27. Lowe SE, Bradshaw JWS. Ontogeny of individuality in the domestic cat in the home environment. *Anim Behav* 2001;61:231–237.

28. Karsh EB. The effects of early handling on the development of social bonds between cats and people. In: Katcher AH, Beck AM, eds. *New perspectives on our lives with companion animals*. Philadelphia: University of Pennsylvania Press, 1983;22–28.

29. Karsh ED, Turner DC. The human-cat relationship. In: Turner DC, Bateson P, eds. *The domestic cat: the biology of its behavior.* Cambridge, UK: Cambridge University Press, 1988;159–177.

30. McCune S. The impact of paternity and early socialization on the development of cat's behaviour to people and novel objects. *Appl Anim Behav Sci* 1995;45:109–124.

31. Estep DQ. The ontogeny of behavior. In: Voith V, Borchelt P, eds. *Readings in companion animal behavior.* Trenton, NJ: Veterinary Learning Systems, 1996;19–31.

32. Beaver BV. Fractious cats and feline aggression. *J Feline Med Surg* 2004;6:13–18.

33. Baerends-van Roon JM, van Roon G. *The morphogenesis of the behaviour of the domestic cat: with special emphasis on the development of prey-catching.* Amsterdam, Netherlands: North Holland Publishing Co, 1979.

34. Heath S. Feline aggression. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine*. Gloucester, England: British Small Animal Veterinary Association, 2002;216–228.

35. Pageat P, Tessier Y. Usefulness of the F4 synthetic pheromone for preventing intra-specific aggression in poorly socialized cats, in *Proceedings*. 1st Int Conf Vet Behav Med 1997;64–72.

36. Frank D, Erb HN, Houpt KA. Urine spraying in cats: presence of concurrent disease and effects of pheromone treatment. *Anim Behav Sci* 1999;61:263–272.

37. Griffith CA, Steigerwald ES, Buffington CA. Effects of a synthetic facial pheromone on behavior in cats. *J Am Vet Med Assoc* 2000; 217:1154–1156.

38. Overall KL. Diagnosing feline elimination disorders. *Vet Med* 1998;93:360–362.

39. Borchelt PL. Cat elimination behavior problems. *Vet Clin North Am Small Anim Pract* 1991;21:257–264.

40. Pryor PA, Hart BL, Bain MJ, et al. Causes of urine marking in cats and effects of environmental management on frequency of marking. *J Am Vet Med Assoc* 2001;219:1709–1713.

41. McKeown D, Luescher UA, Machum M. The problem of destructive scratching by cats. *Can Vet J* 1988;29:1017–1018.

42. Frank D. Management problems in cats. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine.* Gloucester, England: British Small Animal Veterinary Association, 2002;80–83.

43. American Association of Feline Practitioners. Position statements. Available at: www.aafponline.org/positionstate.htm. Accessed Sept 1,2002.

44. Kane E, Morris JG, Rogers QR. Acceptability and digestibility by adult cats of diets made with various sources and levels of fat. *J Anim Sci* 1981;53:1516–1523.

45. Kirk CA, Debraekeleer J, Armstrong PJ. Normal cats. In: *Small animal clinical nutrition.* 4th ed. Marceline, Mo: Mark Morris Institute, 2000;291–320.

46. Mugford RA. External influences on the feeding of carnivores. In: Dare MR, Maller O, eds. *The chemical senses and nutrition.* New York: Academic Press Inc, 1997;25–50.

47. Adamec RE. The interaction of hunger and preying in the domestic cat (*Felis catus*): an adaptive hierarchy? *Behav Biol* 1976; 18:263–272.

48. Stasiak M. The effect of early specific feeding on food conditioning in cats. *Dev Psychobiol* 2001;39:207–215.

49. Stasiak M. The development of food preferences in cats: the new direction. *Nutr Neurosci* 2002;5:221–228.

50. Seksel K. *Training your cat*. Melbourne, Australia: Hyland House, 2001.

51. Mills DS. Learning, training and behaviour modification techniques. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine*. Gloucester, England: British Small Animal Veterinary Association, 2002;37–48.

52. Tan PL, Counsilman JJ. The influence of weaning on prey-catching behaviour in kittens. *Z Tierpsychologie* 1985;70:148–164.

53. Neville P. The behavioural impact of weaning on cats and dogs. *Vet Annu* 1996;36:99–107.

54. Coffey J, Seksel K. *Kitten kindy* [information guide and accompanying videotape]. Wondonga, Australia: Australian Small Animal Veterinary Association and Artarmon, Australia: Uncle Ben's of Australia, 1998.

55. Hunthausen W, Seksel K. Preventive behavioural medicine. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine*. Gloucester, England: British Small Animal Veterinary Association, 2002;53–60.

56. Overall KL. *Clinical behavioral medicine for small animals*. St Louis: Mosby Year Book Inc, 1977.

57. Carlstead K, Brown JL, Strawn W. Behavioral and physiological correlates of stress in laboratory cats. *Appl Anim Behav Sci* 1993;38:143–158.

58. Patronek GJ, Sperry E. Quality of life in long-term confinement. In: August JR, ed. *Consultations in feline internal medicine 4*. Philadelphia: WB Saunders Co, 2001;621–634.

59. Rochlitz I. Recommendations for the housing of cats in the home, in catteries and animal shelters, in laboratories and in veterinary surgeries. *J Feline Med Surg* 1999;1:181–191.

60. Greco DS. The effect of stress on the evaluation of feline

patients. In: August JR, ed. *Consultations in feline internal medicine*. Philadelphia: WB Saunders Co, 1991;13–17.

61. McMillan FD. Development of a mental wellness program for animals. *J Am Vet Med Assoc* 2002;220:965–972.

62. McMillan FD. Effects of human contact on animal health and well-being. *J Am Vet Med Assoc* 1999;215:1592–1598.

63. *American Association of Feline Practitioners/Academy of Feline Medicine Panel Report on Feline Senior Care*. American Association of Feline Practitioners, 1998;1–26.

64. Fortney WD. Geriatrics and aging. In: Hoskins JD, ed. *Geriatrics and gerontology of the dog and cat*. 2nd ed. New York: Elsevier Science Publishers BV, 2004;1–3.

65. Overall KL. Behavioral medicine and neurology. In: Braund KG, ed. *Clinical neurology in small animals—localization, diagnosis and treatment*. Ithaca, NY: International Veterinary Information Service, 2002.

66. Overall KL. Identifying and managing behavioral changes in older dogs and cats. *DVM Best Pract* 2002;Sept:26–29.

67. Houpt KA. Cognitive dysfunction in geriatric cats. In: August JR, ed. *Consultations in feline internal medicine 4*. Philadelphia: WB Saunders Co, 2001;583–590.

68 Overall KL. Paradigms for pharmacologic use as a treatment component in feline behavioral medicine. *J Feline Med Surg* 2004;6: 29–41.

69. Overall KL. Pharmacological treatment in behavioral medicine: the importance of neurochemistry, molecular biology, and mechanistic hypotheses. *Vet J* 2001;62:9–23.

70. Westfall DS, Twedt DC, Steyn PF, et al. Evaluation of esophageal transit of tablets and capsules in 30 cats. *J Vet Intern Med* 2001;15:467–470.

71. American College of Veterinary Behaviorists. Available at: www.dacvb.org. Accessed Feb 15, 2003.

72. North American Veterinary Conference. Available at: www.tnavc.org. Accessed Feb 15, 2003.

73. Post-Graduate Foundation in Veterinary Science. Available at: www.pgf.edu.au. Accessed Feb 15, 2003.

74. American Veterinary Society of Animal Behavior. Available at: www.avma/avsab. Accessed Feb 15, 2003.

Appendix 1—Behavioral assessment questions to ask at every veterinary visit.

When obtaining a history, encourage early detection or prevention of behavioral problems by asking the following questions:

- Does your cat urinate or defecate outside of the box?
- Does your cat spray (spraying occurs when a cat backs up to a vertical surface, kneads the feet, and flicks the tail tip while projecting urine)?
- Does your cat have aggression toward people, including hissing, biting, or scratching? Toward any specific family members? Toward strangers?
- Does your cat have fearful behaviors that concern you?
- Does your cat have destructive behaviors, such as scratching or chewing objects in the home?
- Does your cat have problematic interactions with other cats or pets in the household?
- Has there been any change in your cat's behavior or disposition?
- Do you need any further information regarding your cat's behavior?

Appendix 2—Developmental periods in cats with regard to ingestion (I), social development (S), elimination (E), and other (O) characteristics.

Stage/age	Normal at this stage	To-dos for caregivers	Veterinary care	Awareness items
Neonatal/birth to 2 weeks	I—Diet entirely milk. S—Minimal social interaction. E—Stimulated by mother O—Eyes open, walking by 14 days, can't regulate body temperature, and can't groom self.	I—Provide high-quality nutrition for queen or kitten formula. S—Minimal but gentle handling. E— If the queen is not present, use a wet, warm washcloth to stimulate eliminations. O—Provide warm, safe environment.	None unless ill or failure to thrive.	If queen not present, rub perianal area with warm, wet towels to stimulate eliminations.
Early socialization/ 3 –9 weeks	I—Begins to eat solid food, gradually ceases milk consumption. S—Sensitive period for social learning Social play begins and increases steadily. Learns many social skills. E—Develops control of bladder and bowel function. Begins to use litter box. O—Object play begins and increases. Climbing and running begin. Capable of complex learning. Scratching and predatory behavior begin. Eye color changes. All temporary teeth erupt. Can regulate body temperature. Begins to groom self.	I—Provide high-quality kitten food and fresh water daily. S—Frequent gentle handling and play with various people including men, women, and supervised children. Expose to other cats and species while ensuring safety. Take kitten socialization classes if available. Reward appropriate friendly behavior to humans and all other animals. E—Provide litter boxes with low sides for easy entry. Scoop litter boxes twice daily. Use unscented litter. O—Enrich environment, including providing toys. Kitten-proof home. Expose to novel objects and locations. Make the carrier a safe haven. Begin tooth brushing. Gently examine ears, teeth, and nails. Groom. Provide scratching post. Begin training to harness and leash. Begin training to sit, come, and respond to other commands.	Ideally, first physical examination, deworm, FeLV/FIV test, and vaccines. Offer kitten socialization classes. Discuss behavior and nutrition.	Never use hands and feet to play with kittens. This teaches your kitten bad habits. Always use toys.
Late socialization/ 9–16 weeks	I—Eating solid food. S—Continues to learn social skills. Social play peaks. Social conflict over status may emerge. E—Continues use of litter box. O—Vigorous exploration of the environment and climbing. Begins to lose temporary teeth.	I—No change. S—Continue social education. If had no previous social education, initiate slowly. E—May need larger litter box (minimum box length 1.5 times cat's body length). O—Provide vertical space (eg, climbing structures). Continue basic training.	Serial physical examinations, vaccines, and needed testing. Discuss nutrition, behavior, and neutering. Offer kitten classes. Neuter if not done. Repeat FeLV/FIV testing.	Kittens that have not had adequate social experience during early socialization may have poor social skills and require extra effort to acquire good social skills.
Adolescence/ 17 weeks–1 year	I—No change. S—Sexual maturity if not neutered. Social play lessens. Likely to be subordinate to larger adults but may challenge these cats for status. E—Spraying may occur, less likely if neutered. O—If allowed outdoor access, may wander further and for longer periods than before.	I—Start transition to high-quality adult food at 6–8 months of age. Provide food puzzles and food toys. S—Continue to play with and reward friendly behavior. Contact veterinarian if serious conflicts arise. E—Reevaluate litter box size. Contact veterinarian if spraying or inappropriate elimination occurs. O—Provide identification (eg, microchip or break-away collar and tag), especially if cat goes outdoors.	Neuter if not previously done, discuss behavior and nutrition, repeat FeLV/FIV testing.	If not neutered, your cat is more likely to urine mark in the house, get into fights, and roam long distances. Female cats that are not neutered can have unwanted kittens.
Adult/1–6 year	I—Metabolic rate slows, may gain weight if diet and exercise not monitored. S—Matures socially at approximately 2–3 years. Personality strongly affected by genetics and early experience. Social play decreases but may continue given an available playmate. E—If sexually intact male, urine odor becomes strong.	I—Reassess body condition and food intake every 3 months. Encourage exercise. S—Continue to play with and reward friendly behavior. E—Reevaluate litter box size. Contact veterinarian if spraying or inappropriate elimination occurs. O—Rotate toys for self-play. Replace equipment and supplies such as beds and litter boxes as needed.	Physical examination a minimum of once yearly. Vaccines and testing as recommended by veterinarian.	Behavior problems are best treated early. Contact your veterinarian if any behavior problems arise. Obesity carries the same health risks as it does in humans. Depending on coat and body condition, extra grooming may be needed.
Adult/≥ 7 year	I—Changes in appetite can occur. S—Decreased activity may lead to decreased social interaction.	I—Monitor appetite and water intake. Contact veterinarian if increases or decreases. S—Continue social interaction, even if lower activity level is warranted. E—Contact veterinarian if elimination concerns occur or persist.	Physical examination every 6 months. CBC, serum biochemical panel, urinalysis, and thyroxine every 6–12 months. Discuss behavior and nutrition.	Interaction with younger cats may encourage activity, but extremely active young cats may be incompatible. Extra grooming may be needed depending on body condition and coat. Medical problems increase with age and may appear as behavior changes. Contact your veterinarian if changes occur.

Continued on page 82.

Appendix 3—Topics to be covered in 2-week kitten class or the first few veterinary visits.

Understanding normal behavior helps us:
- Interact with our cats.
- Set up an enriching life for them.
- Prevent behavior problems.

Cats are social animals
- The kitten class is a perfect environment to teach kittens to interact positively with other cats and be exposed to a variety of people in a safe setting.

How cats communicate
- The importance of smell.
- Reading cat's body language.
- Attention to the tail, ears, pupils, raised hackles (Figures 1 and 2).

Rules for playing with people
- Appropriate and inappropriate play for kittens; prevention of play biting.
- Safe, interactive toys; chasing games.
- Creative use of cardboard boxes, empty paper bags, tunnels.
- Food treasure hunts and food puzzles.

Scratching posts and proper use of claws
- Scratching is normal.
- Select scratching posts that are sturdy and made of materials cats prefer (usually wood, sisal rope, rough fabric).
- Teach kittens to use a scratching post.
- Locate the scratching post next to a window, sleeping area, or other areas favored by the cat.
- Many cats prefer vertical scratching posts, whereas some prefer horizontal posts.
- Nail trimming and other alternatives prevent damage from claws.

Home maintenance helps keep cats healthy and less fearful at the veterinary hospital
- Tooth brushing—the best method for dental care and early detection of oral disease.
- Nail clipping and handling of feet.
- Use of a thermometer.
- How to administer medication—this makes care easier when the animal is ill.

Normal elimination behavior and promoting good litter box use
- Call the veterinarian if a cat is not using the litter box.

Normal feeding behavior and how to feed cats
- Kitten diets; when to switch to adult food.

Enriched environments, including play and mental stimulation, are key to a low-stress life
- Value of routines, including specific allotted quality time.
- Climbing, perching, and bedding areas.
- Vertical spaces (inexpensive shelving and purchased or homemade climbing trees).
- Hiding spaces (retreats).
- Interactive toys; rotation of toys.
- Indoors versus outdoors.
    - The benefits and risks of allowing cats outdoors.
    - How to fit and use a harness for walking.
    - Outdoor enclosures for cats.
    - How to give cats the feeling of the outdoors without the risks (eg, bird feeders outside the window and window perches).

Pleasant veterinary visits
- Carrier or crate training.
- Adjusting to car rides.

Veterinary care to protect physical health (based on veterinary clinic recommendations)

Cats can be trained
- Reward with treats or positive attention to encourage desired behavior.
- Redirect undesired behavior.
- Don't punish, swat, slap, or yell.
- Cats can be trained to scratch in appropriate areas.
- Cats can be taught to sit, come, and perform a variety of tricks.
- Teaching cats to allow home maintenance, such as toothbrushing, helps improve health, early detection of problems, and behavior at the veterinary hospital.

Special situations, if appropriate for household
- Getting along with other dogs and cats.
- Getting along with children.
- Getting along with visitors.
- Exposure to novel social and physical environments.
- How to adjust to new environments and new people.

Common adult cat problems and how to prevent them
- Obesity.
- Inappropriate elimination.
- Aggression.
- Various expressions of anxiety and fear are among the most common behavior problems.

Emphasis at the final kitten veterinary appointment or kitten class
- This is the start and not the end of working on positive behavior.
- The importance of routine adult wellness to address physical and behavior problems.

When to call the veterinary clinic
- Get help early. Don't believe that bad behavior will go away or that the cat will grow out of it.
- Contact the veterinary clinic with any behavior or medical concerns.

Appendix 4—Teaching kittens to accept handling.

Week 1 demonstrations	Week 2 demonstrations
Check mouth—lift lips and touch gums with fingers	Brush teeth (start with gauze or washcloth)
Open mouth, offering food immediately after	Give pills
Lift and lightly tug tail	Take temperature; childproofing
Rub and massage ears	Clean ear flap
Touch belly	Brush undersides
Stroke with a brush or comb	Grooming
Fit and wear a collar or halter	Walk on a leash

Appendix 5—Orally administered medications for behavior problems in cats.

Diagnosis	First drug of choice (trade name [drug class])	Dosage	Comments
Fear or anxiety associated with veterinary visits or car trips and panic	Alprazolam 0.25-mg tabs (Xanax [benzodiazepine])	0.0125–0.025 mg/kg, q 24 h (to start); dosage or frequency may need to be increased	Rapid onset of action (1–2 hours). May increase appetite.
	Oxazepam 10-mg caps (Serax [benzodiazepine])	0.2–0.4 mg/kg, PO, q 12–24 h	
Intercat aggression	Buspirone 5- and 10-mg tabs (BuSpar [azapirone])	0.5–1.0 mg/kg, q 12–24 h; 5–10 mg/cat, q 12–24 h	For victim only! Will make cat more outgoing and assertive.*
Mild nonspecific anxieties, psychogenic alopecia, inappropriate urination secondary to feline interstitial cystitis	Amitriptyline 10-mg tabs (Elavil [TCA])	0.5–1.0 mg/kg, q 12–24 h; start at 0.5 mg/kg, q 12 h; 2.5–5.0 mg/cat, q 12–24 h	5–7 days to effect.
Mild anxieties with avoidance of sedation	Nortriptyline 10-mg caps (Pamelor [TCA])	0.5–1.0 mg/kg, q 12–24 h; 2.5–5.0 mg/cat, q 12–24 h	5–7 days to effect.
Ritualistic behavior associated with anxiety or obsessive compulsive disorder	Clomipramine 25-mg caps in human formulation (Anafranil); 20-mg scored tab in veterinary formulation (Clomicalm [TCA])	0.5 mg/kg, q 24 h	5–7 days to initial effect; long term effects may take a minimum of 3–5 weeks.
Social phobias, anxieties concerning social interactions, and related urine marking	Paroxetine 10-mg tab, 10 mg/5 mL suspension (Paxil [SSRI])	0.5 mg /kg, q 24 h	6–8 weeks to profound effect. For victims needing more confidence in interactions (paroxetine or sertraline).
Panic or generalized anxiety and associated intercat aggression and marking	Sertraline 25-mg cap (Zoloft [SSRI])	0.5 mg/kg q 24 h	6–8 weeks to profound effect. For victims needing more confi dence in interactions (paroxetine or sertraline).
Outburst or impulse-control aggression and related anxieties concerning social interactions; related urine marking	Fluoxetine 10-mg cap or tab, 5 mg/mL solution (Prozac [SSRI])	0.5–1.0 mg/kg, q 24 h	6–8 weeks to profound effect. Do not use transdermally because of the long half-life. For aggressors with aggression outbursts.
Cognitive dysfunction	Selegiline (5-, 10-, 15-, and 30-mg tabs ;Anipryl [MAOI])	0.5–1.0 mg/kg, q 12–24 h (start with low dose)	Give in the morning. Do not use in combination with SSRIs or TCAs.

*Action of drug relies on resultant social interactions to effect and maintain change.
SSRI = Selective serotonin reuptake inhibitor. TCA = Tricyclic antidepressant. MAOI = Monoamine oxidase inhibitor.
All listed drugs are used extralabel for cats. Obtain informed client consent before using. Before prescribing medication for any cat with a behavioral problem, first rule out any medical problems and conduct a full physical and laboratory evaluation. Drug recommendations were based on results of large multicenter drug trials in human medicine and a series of open-label and placebo-controlled, double-blind studies in cats. To convert mg/kg to mg/lb, divide by 2.2.

Continued on page 84.

Appendix 6—Algorithm* for treatment length and tapering schedule for SSRIs and TCAs.

1—Treat for as long as necessary to begin to assess effects:
7–10 days for TCAs with nonspecific actions (amitriptyline)
3–5 weeks minimum for SSRIs and TCAs with more specific actions

Plus

2—Treat until cat either has no signs associated with diagnosis or treat at a low, consistent level for a minimum of 1–2 months

Plus

3—Treat for the amount of time required to attain the level described in No. 2 so that reliability of assessment is reasonably assured for a minimum of another 1–2 months

Plus

4—Taper during 7–10 days for TCAs with nonspecific actions (amitriptyline) and 3–5 weeks minimum for SSRIs and TCAs with more specific actions or more slowly. These drugs work by changing specific neurochemical receptor function in neurons. When administration is stopped, these changes may reverse over approximately 3–5 weeks. Although acute adverse effects are seldom associated with sudden cessation of administration, reversion to the former, untreated state is considered a profound adverse effect and may not be responsive to reinitiated treat ment with the same drug, same dose, or both.

Total: Treat for a minimum of 4–6 months.

*Based on mechanism of action, half-life of parent compounds and intermediate metabolites, and potential adverse effects and relapse. Courtesy of Dr. Karen Overall. *See* Appendix 5 for key.