

GET CATTITUDE, FELINE FRIENDLY PRACTICE: RESPECTFUL HANDLING RATHER THAN CAT WRANGLING

Margie Scherk DVM, Dip ABVP (feline practice)
Vancouver, B.C., Canada

What/who is a cat? Introduction

What characteristics make this species different from us or from dogs? By understanding our feline patients better, we can provide a better experience and environment for them. The basis of working cooperatively with cats is empathy based on an understanding of their nature and behaviours and trying to imagine what *their* experience is like. We are taught a lot about how to perform techniques, how to make a diagnosis and what therapies are appropriate, but oftentimes this objectifies the patient. Our own experiences as a patient in the human health care system hopefully include caring and competent professionals but may also include feeling less than cherished as unique individuals. Do we feel *cared* for or merely “processed” in a professional and polite manner? Is the person interacting with you truly empathic or only sympathetic? Are WE processing our patients, checking them off in our minds or on the day sheet as we “complete” the procedure or office call? And what about the environment? Are hospital gowns and paper covered examination beds designed for our comfort or for the healthcare team? Are stainless steel cages and tables designed for the comfort of our patients or for ease of disinfection, height and durability?

Working with a species that has not evolved with a social structure similar to ours provides interesting challenges to the veterinary practitioner when working with cats. Cats are able to function completely efficiently as a solitary creature. Cats *do* have complex and changing social interactions which make for a changing structure, much more intricate than that of a herd or pack species. Cats are also small predators. This has affected their anatomic and physiologic development, which has remained unchanged over several million years. While being predators, their size also makes them prey to other species. While cats can live alone or as part of a community, the allocation of space is based on resource availability. And even with plenty of prey available, cats hunt alone and eat alone. For us to work with cats in a way that they feel secure and are willing to cooperate with, we have to try to imagine what it is like to be a cat. In these presentations, we will try to look at cats in a different way and think about how to adjust our interactions and the physical space to reduce the strangeness and threat that cats appear to experience in the veterinary clinic.

Relying on the “fight or flight” or epinephrine response, they escape situations viewed as dangerous. From the perspective of a cat, we are, and what we do is, dangerous. Accordingly, one of the great challenges we see on a daily basis is the frightened and assertive cat. It is essential to remember at all times that this small creature feels more threatened than we do so that we do not become frightened ourselves. Because cats are small, they try to avoid physical confrontation at all costs and attempt to intimidate using sounds and posture as much as possible. Some examples of practical applications of what we will discuss include:

1. Handling the uncooperative cat: a comprehensive physical examination can usually be done using a towel as a protective barrier. Facing the cat away from you is less threatening for him/her. Confining the cat between your legs as you sit on the floor provides adequate persistent firm restraint that is reassuring rather than frightening.
2. Collection of blood and urine can be done by bundling a difficult cat's forelimbs, torso and head in a towel and using the medial saphenous vein and a lateral approach for cystocentesis. This vein is also a superb choice for catheter placement and administration of intravenous medications.
3. Blood pressure evaluation may also be done recognizing that a *persistently* elevated systolic value of greater than 170 or 180 mm Hg is probably represents true

hypertension rather than the stress response. If in doubt, repeat the value later on during the visit.

4. Feliway, a synthetic analog of a facial pheromone produced by cats has, in general, a calming effect on cats. Spray it into kennels and carriers and even on your clothing before handling an anxious cat. Let the substance evaporate for a few minutes before placing kitty into the sprayed space. Plugging the diffuser form of Feliway into treatment and hospitalization areas as well as reception and consultation rooms can help patients relax. <http://www.feliway.uk.com/>
5. Elevated blood glucose and glucosuria may be a result of persistent stress. The diagnosis of diabetes, therefore, is dependent on finding an elevated serum fructosamine or glycated hemoglobin.

Signaling: reading the cues

Tactile cues

Touch is very important to cats. They rub against each other (allorubbing), against us, and against inanimate objects. Whether full body rub or a flank, tail, cheek or other body part, this is believed to be an affiliative behaviour and is seen between members of the same social group. Additionally, rubbing is not only tactile, it can also be a means of depositing scent. Allorubbing is not always reciprocated. Social rubbing may consist of rubbing a head, a flank or a tail against another (cat/person/thing). Cats often rub against us; unfortunately, we often misinterpret it as being a request to be fed.

Allongrooming (mutual grooming) may precede a playful attack, follow a stressful interaction and appear to be conciliatory or may stand alone as grooming.

Kneading and treading occurs in both a kitten -regressive behaviour in adult- or as a component of sexual interaction.

The neck bite/scruffing is a signal that is used in three contexts: transporting a young kitten, part of sexual mounting and as a means to dominate another cat in a fight. Our use of scruffing fits most closely with the last context and probably does not belong in a conciliatory, respectful cooperative setting.

Olfactory cues

The role of smell and scent in feline communication is something we, as humans, are ill equipped to appreciate. It has been estimated that the size of the olfactory epithelium in cats can be up to 20 cm² whereas humans have only 2-4 cm² of olfactory epithelium. Signals may be left by several methods. The one that is most problematic for cats living with people is urine spraying. It is a potent communication tool that humans fail to appreciate. Other forms of olfactory messaging are cheek marking an object or individual, scratching to leave scent from glands below pads, and midden: leaving a deposit of feces uncovered in a strategic place. All of these have several advantages over visual cues. They exist over time and in the absence of the sender. This allows for remote communication without direct interaction and its potential for conflict. This is beneficial in areas with poor visibility as well as at night. Thus, these cues help cats spread out over space as well as time-share territory. The disadvantage of this form of communication is that the sender has no control over a message once it has been deposited; it can not be altered or removed and no adjustments can be made in response to the recipient's reaction. In this way, it is akin to email. So, urine marking in the home is an attempt to signal to the other cats when "I was here" and to establish a routine so that the cats can keep a distance by time-sharing the same space without needing to come into conflict. Every time we eliminate the urine, we defeat this communication!

Due to our poor awareness of smell, we can not “read” the cues a patient may be providing us with and are unable to fathom the overwhelming olfactory messages that the clinic experience must represent to them.

Visual cues: body language: posture, facial, tail

Body language (including tail position) and facial expression are extremely effective at maintaining or increasing distance between hostile individuals. This requires an unobstructed view, adequate ambient light and, unlike olfactory cues, that the two individuals are in the same space together. Body posture gives the big picture of relaxation or fear but facial expression (eyes, ears, whiskers, mouth, visibility of teeth) provides the finer details *and* changes more rapidly. Thus, in a clinic setting, for us to understand the mental/emotional state of an individual, to avoid provoking them and getting hurt, it is extremely important to watch and interpret facial changes.

As a species that generally leads a solitary existence, survival depends on speed, stealth, self-reliance and outsmarting others. As a consequence, cats may “say one thing but mean another” when they act aggressive, it is generally as a means to hide fear; “stoicism” hides vulnerability; subtle changes in behaviour mask significant illness. They do not rely on a society for protection and, in fact, avoid it when threatened. Body postures communicate confidence and physical prowess that may not be present. Keeping a threat at a distance avoids the necessity for a physical confrontation.

The arched back “Halloween cat” typifies this façade of confidence and increased size (**Figure 1**). The attempt to make oneself smaller, on the other hand, to minimize threat and evade attention is portrayed by a crouch and withdrawal. In these, as in all of the postures in between these two extremes of fear/threat, the weight remains on all four paws so that flight/chase is possible. A cat who is feeling less fearful does not need to be on his/her feet.

Rolling has several presentations. The social roll is an invitation to interact; the cat lies in lateral position. An extremely fearful threatened cat will roll exposing his/her abdomen with all four feet ready for self-defense. This cat will also be showing all of his weapons (nails and teeth) and be screaming.

Tail position (**Figure 2**) allows observation of communication from further away. Tail up, happy Js (hooked tails) and tail quiver are greeting behaviours. Tail tucked to one side is part of becoming less visible as in crouch. Bottlebrush, pilo-erected tail is part of threat/bluff behaviour.

Facial expressions (**Figure 3**) can change more rapidly than body posture and should, therefore, be observed closely. Cats have extremely mobile ears. When forward, a cat is listening and is generally relaxed or alert but not emotionally aroused.

Turned laterally/flat “airplane ears” indicate that the cat is more fearful/threatened. When ears are back and tight to the head, the cat is feeling very threatened and frightened. This cat will have a partially open or fully open mouth and be hissing, spitting, yowling or screaming. This cat will protect him/herself if we fail to reduce the perceived threat level.

Ears turned back but erect indicates the most reactive and aggressive state. In this case, the mouth will be closed and the cat will be emitting a low growl with or without swallowing. This is the cat who will attack you.

Vocalizations

This form of communication requires the presence of the recipient and has the benefit of being easy to change moment by moment. Again, as with other signaling, cats have a well developed repertoire of sounds to convey a need/wish for increasing distance between

individuals. These include growl, yowl, snarl, hiss, spit, gurgle, long miaow, wah-wah and pain shriek. The sounds made for socialization are trill/chirrup, purr, puffing, prusten, chatter, miaow and sexual calling. The cat who is open mouth screaming is highly emotionally aroused but likely to be less aggressive than the cat who is close-mouthed growl/wah-wah/mowling.

Cats use a combination of these different signal types in any situation; we have to learn to look for all of them and interpret them together.

Reducing the threat of the clinic experience from the cat's point of view

Reading and understanding these cues is an important part of reducing the fear for the patient. It also allows us to respond respectfully. We can avoid using signals that are hostile (e.g., scruffing, making shushing/hissing sounds, staring). Try to imagine what it might be like to be a cat. Imagine:

- walking on four feet,
- jumping 10 or more times your height,
- perceiving the world in overlapping clouds of smell,
- having much better vision in dim lighting,
- grooming yourself with your tongue,
- locating sound by rotating your ears,
- having poor close-up vision so using your whiskers to locate things,
- and having a tail!

We mustn't forget that the frightening experience already begins at home. The carrier comes out, your caregiver is nervous, he/she chases you around and tried to stuff you into the carrier. You resist and may need to resort to self-defense. Human sweat, fear, maybe blood smells. You may feel so anxious that you soil yourself! Eventually you are in the carrier. Everyone is exhausted. Then you are moved into a "car" that moves without you moving. You may be a bit nauseous; certainly you are scared. You cry out repeatedly. You may vomit or soil yourself. Then the "car" stops and you get carried on a noisy and unfamiliar street and into a place with overwhelming smells and sounds! And you are already aroused and anxious....look out!

We can reduce this or, in the case of a new cat, prevent this from occurring by teaching/habituating the cat to associate positive experiences with the carrier and the car (and even, the clinic). By leaving the carrier out (or using a Hide Perch Go box/carrier) so that the cat sees it routinely and enters it for food treats or other rewards, we dampen the initial tension and fight. Taking the cat on short car rides that are unassociated with the clinic helps recondition the negative associations with the clinic. Finally, taking the kitty to the clinic to be fussed over or only to get a treat will help teach the cat that the clinic isn't necessarily a horrible place. All of these associations can be assisted with clicker training.

Reducing exposure to predators and threats

- Other cats
- Dogs
- Other species
- Humans (the ultimate predator)

Cats are not solitary, asocial creatures but they are emotionally capable of surviving alone and do not require social contact. In the wild, the number of feral cats living together is dependent on the availability of resources: food, water, privacy and safety, latrine availability and sexual partners. This results in little competition and a social structure that does not require sharing or taking turns. There is no need for a linear hierarchical structure. Stress is minimal unless there is a threat from a stranger for one of the resources. Thus,

communication and aggression is largely developed to keep distance between individuals and prevent contact with outsiders. The natural grouping, should there be enough resources, is a colony of related female cats with their young who they will jointly defend and nurse. Males are relegated to the periphery and vie for the prime breeding spot; only one tom usually lives with the group.

Forcing cats to live together in a human household results in stress as they have to share their home territory and resources with cats that they are not related to. The goal is to provide an environment with that is safe and secure and has adequate resources that don't require facing the risk of ambush. The picture of many cats eating together is not a reflection of community, rather it reflects the core need for food; aggressive behaviours are suppressed in order to get food. The consequences of this chronic stress that may be manifested as overgrooming, desperate urine spraying to try to clarify time and space sharing, overeating, or other behavioural disorders. Lack of enough safe water stations may result in dehydration. If the cat doesn't have hiding places and perches that are sufficiently hidden or apart from the other cats, then he/she is perpetually vulnerable and unable to have some control over stress. For individuals predisposed to stress-aggravated conditions (such as sterile/interstitial cystitis, IBD, allergy), there will be medical fallout. We need to remember to utilize three dimensional space. Hiding places and perches can be readily created by placing towels or bedding on top of cabinet surfaces, refrigerators, bathroom counters. One must be cognizant of the (perceived) potential for ambush and not set a cat up for this frightening event therefore cupboards or corner perches without a second exit or litter boxes with hoods are to be avoided. A consistently safe environment consists not only of food, water and shelter, but also predictable routines, sounds, scents and routines.

Environmental modification

Looking back to our clinic/hospital environment, what can we do to reduce the stress and threat level of the physical and social environment? What things or events assault the five senses of a cat? How can we make positive changes to these?

| Sense | Threat | Reduce threat by |
|--------------|---------------|-------------------------|
| Smells | | |
| Sounds | | |
| Sights | | |
| Taste | | |
| Touch | | |

Handling (examination, hospitalization, diagnostics and treatments)

The goal is to handle our patients respectfully and provide an appeasing environment. This is achieved by reducing threat and, by doing so, the cat's need to react defensively. Avoid doing things in a way that use threatening feline body language or tone. The aggressive cat is upright, stiff legged, large: sit down. He stares at the frightened cat into his eyes: examine cats from behind and, other than for the ophthalmic evaluation, avoid direct facial viewing. The aggressive cat growls and uses low tones; use a light, upper register tones, perhaps chirruping as cats do when they are relaxed with conspecifics. Do not shush a cat to try to calm her as you might a child; this is the equivalent of a hiss. Likewise, avoid short repetitive sounds as these may resemble spitting rhythms. Purrs, chuffing, trills, and chirrups are social welcoming sounds. Scruffing is an unnecessary act of dominance that cats may resent.

When cats feel secure and safe, even just able to hide their faces in an elbow or a towel, they allow most procedures. Try to keep all four paws to the floor and avoid changing the cat's position as much as possible. A comprehensive examination, blood and urine collection, body temperature and blood pressure evaluation can all be done without moving the cat. Examine him/her in the base of his own carrier if the lid can be removed. Don't hang a cat's forelimbs over the edge of a table for jugular venipuncture. For an already frightened individual, additional lack of support under paws is not reassuring. Remember that when you reach in to a kennel to bring out a patient, you are blocking their light and appear as a looming frightening stranger.

Approach the opening from the side so that some light still enters. Do not block any chance for escape; if the possibility to have some control over her environment and situation exists, she will be much more cooperative. Because cats rely on flight and fight for survival and are not reliant on others, when it comes to restraint, LESS IS MORE! Cats inherently resist intimate handling and restraint. By confining them, we take away their sense of control and cause them to react. How easy it is to condition negative emotional responses....cat bags, masks, gloves all carry the scents of previous similarly terrified patients plus other sundry smells (anal gland secretion, pus, blood, halitosis, etc.) Use of a towel is all that is needed to burrito a cat in for protection of the handler. Remember, a cat would rather flee than attack.

Food, feeding and nutrition in a feline context

We may not be what we eat, but what we eat certainly shapes our biology and how we live! Being obligate carnivores has affected everything about cats from their hunting behaviour to their solitary eating many small meals a day to the size of their stomach and their lack of salivary amylase to their social structure. Cats naturally hunt for their food, yet the drive to hunt is independent from the need to eat. Hence, feeding more food doesn't stop them from killing birds or mice, it merely makes them gain weight. On average, a cat needs 10-15 attempts before they are successful at killing prey; thus the drive to eye, stalk, pounce and kill is permanently turned on else a cat would starve. Given that the average mouse provides about 30-35 kcal or energy, and a cat needs 50 kcal/kg ideal weight/day, the 5 kg cat needs 250 kcal or 8 mouse sized portions/day. Spread out throughout the day, not all at one time. Both feeding twice a day or leaving a bowl that is never empty are "unnatural" ways for cats to eat. Because a 30 kcal meal is approximately 10 pieces of an average maintenance dry food, even eating 10 extra pieces/day results in a 10% (1 lb) weight gain/year. We also contribute to obesity by our need for interaction with our cats. Cats (in general) interact with us frequently and (as mentioned) at a low intensity/casually. We, on the other hand, generally, want fewer, more intense/focused periods of interaction with them. We also feel rejected or like a bad provider if our cats don't eat their food eagerly and want second helpings.

Eating is not a social activity for cats. And, because their meals are so small, we misunderstand and want them to eat more. We try more and more diets until we have "evidence" that they enjoy their food. And so we train them to ask for food and they train us to respond to their boredom by feeding them.

Opportunities to express hunting behaviour are a basic need for a cat. If a cat doesn't have the opportunity to hunt, toys which meet appropriate criteria are small (prey-sized), make high-pitched squeaks or cheeps and move in a rapid, unpredictable fashion. Also, allowing them to hunt for their food (bowl) or use a feeding toy are mentally stimulating. Examples of toys of this sort are:

Pipolino (<http://www.pipolino.ca/eng/pipolino.html>)

Multivet Slim Cat (<http://www.petsafe.net/Products/Feeders/SlimCat.aspx>)

Cat Activity Fun Board (<http://www.traininglines.co.uk/cat-activity-fun-board-3397-0.html>)

Go!Cat!Go! Play-N-Treat balls

Cats diverged from canids approximately 30 million years ago, evolving metabolically into obligate carnivores with unique strategies for the utilization of protein and amino acids, fats and vitamins. This concept must be at the centre of trying to understand the nutritional needs of cats and planning dietary therapies for health disorders. Domestic cats have evolved from the wild cat model remarkably little. (They display a much narrower diversity of phenotype than dogs.) They are anatomically and physiologically adapted to eating 10-20 small meals throughout the day and night. This allows them to hunt and eat when their prey are active. Small rodents make up the majority of their diet, with rabbits, birds, insects, frogs and reptiles making up a smaller proportion. The average mouse provides 30 kcal of energy, which is about 8% of an average feral (i.e. active) cat's requirements. Repeated hunting behaviours throughout the 24 hour period are needed to meet this need; this has evolved into the normal grazing feeding behaviour of domestic cats. Under stressful situations, cats will refuse a novel food; under other circumstances, the same cat may be very adventuresome and chose a new diet over their familiar food.

A critical difference in cats is that, while other species are able to rest their metabolic pathways from the efforts of glucose (energy) synthesis when they have been fed cats must continue gluconeogenesis in both the fed and fasted states. When cats are anorectic, they catabolize body proteins. Protein supplementation during fasting will slow hepatic lipid accumulation. Urea cycle enzymes in the liver of cats are always „turned on“. This does not, however, imply that cats cannot use carbohydrates as they are capable over the longterm to adapt to lower protein diets. Adult cats have a much higher requirement for protein than dogs or humans. Expressed as a percentage of diet, adult cats need 29% vs. the adult canine requirement of 12% or the human need for 8%.

Esophagostomy tubes are easy to place in under 10 minutes of anaesthesia. Feeding can be started within 2 hours after recovery. Using a syringeable food such as Hill's a/d or Royal Canin Recovery (1.3 kcal/ml) or Eukanuba Maximum Calorie (2.1 kcal/ml) is ideal. Should they need diluting, use a liquid feline diet, such as Clinicare (1 kcal/ml) rather than water in order to avoid loss of caloric density. These tubes are easy to maintain and can be removed as soon as the patient is eating on his/her own enough to prevent weight loss without nutritional support over a one week period. Should they clog, infusion of 10 ml of a cola drink or meat tenderizer in solution will unplug the tube if left for 10 –15 minutes. Gradually increase the volume of each meal reducing the number of feedings needed to meet the daily caloric requirements, the goal being to have 4 feedings/day, as this is a reasonable number that clients can cope with at home. If, in so doing, vomiting recurs even with a small volume of food (e.g. 10 ml) then "trickle feeding" can be instituted. This consists of fill an empty IV bag with either of the aforementioned diets, Clinicare or another liquid diet, attach it to an IV line, and run the line as a drip throughout the day attached to the feeding tube. Either gravity flow or IV pump are suitable. Use a fresh bag and new solution every 12 hours to prevent bacterial or yeast growth.

When should I consider nutritional support?

Nutritional support should be considered for the severely malnourished cat (20% weight loss, body condition score 1-2/9) or moderately malnourished (a 10% weight loss, BCS 3-4/9) who also have catabolic disease. Some cats will benefit from early intervention even at normal weight and condition if they suffer from advanced renal disease, hepatopathy, protein losing GI or glomerular disease, pancreatitis or bile duct obstruction.

Calculating how much to feed requires that you know the patient's current weight as well as their healthy weight and the caloric densities (kcal/ml) of the diet you are intending to use (see **Table 2**). Use 50 kcal/kg as a rough guide to determine calories needed. Start by feeding 1/3-1/2 of the calories needed for the current, inappetant weight. On day two, feed

2/3-3/4 of this number and on day three, feed the full calories needed for the current weight. For weight gain, gradually increase to the calories needed for the cat's healthy weight.

Example: 3.4 kg sick cat BCS 3/9, healthy weight 4.0 kg BCS 5/9

% weight change = $(4 - 3.4) / 3.4 = 15\%$

3.4 kg X 50 kcal/kg/day = 170 kcal by day 3

170 kcal = 81 ml Eukanuba Maximum Calorie

OR 131 ml of Hill's a/d or Royal Canin Recovery or PVD CV mixed with equal volumes Clinicare or Rebound.

Day 1 feed 30-40 ml of Max Cal or 44-65 ml of the other diets

Day 2 feed 54-61 ml of Max Cal or 87-98 ml of the other diets

Day 3 feed 81 ml Max Cal or 131 ml of the other diets.

Once stable, gradually increase to meet caloric requirements for 4 kg healthy weight.

4 kg X 50 kcal/kg/day = 200 kcal

95 ml Max Cal vs. 154 ml of the other diets.

Caloric densities of convalescent diets, for calculating feeding volumes:

Rebound™: 1 kcal/ml

Clinicare™: 1 kcal/ml

Royal Canin/MediCal Recovery™: 1.23 kcal/ml

Hill's a/d™: 1.3 kcal/ml

Eukanuba Maximum Calorie™: 2.1 kcal/ml

Purina PVD CV™: 1.3 kcal/ml if blended with 170 ml (1 CV can) Rebound™/Clinicare™

Blended with H₂O => 0.7 kcal/ml

Miscellaneous medical considerations for cats

Successful management of a cat with diabetes mellitus requires a committed healthcare team. The client needs to know that they will see improvement, that this will take several months and that they have their veterinary team behind them. Confirming the diagnosis using a serum fructosamine, we book a counselling appointment. At this time, we listen to the client's concerns and beliefs about diabetes and help them understand the pathophysiology. The client is taught to handle insulin and syringes properly, nutrition is discussed and they are taught how to use the diary. The first blood glucose curve (hourly measurements for 12 hours) is booked for two weeks hence; at this time, the insulin dose most likely is adjusted and the client is taught how to perform glucose measurements at home before administration of insulin. Thereafter, curves are performed every 2 weeks until the cat's condition is stable. These are initially performed in clinic. After one month on insulin, a fructosamine is evaluated again. Once the client is comfortable enough with monitoring blood glucose, curves are performed at home and reported by email, phone or fax to the doctor for recommendations.

Being largely self-dependent, cats mask illness and pain extremely well. The signals of problems are often subtle. Listening carefully to clients when interviewing them for the history and their concerns is extremely important. Often clients detect changes intuitively that represent real problems. This is more common, in the author's experience, than the client who is blissfully unaware of significant health problems. By asking open-ended questions, one elicits a more detailed history than using only specific questions. For example: starting with: "Have you noticed any changes in the contents of the litter box?", evokes in a yes/no answer. Asking: "What does his stool look like? Is it hard pellets, moist logs, cowpie or coloured water? When did you first notice this?" provide useful answers.

One simple technique for detecting subtle changes is measuring body weight at every visit and calculating the percentage change in body weight. By 12 –15 months of age, a cat should reach their adult weight. By noting slight changes in weight, either increases or

decreases, one can follow trends and hopefully avert significant problems such as lipidosis or obesity and detect malabsorption of nutrients or catabolism of cancer in the earlier stages.

$$\% \text{ change} = \frac{\text{previous weight} - \text{current weight}}{\text{previous weight}}$$

Monitoring body weight in hospitalized cats is invaluable in helping to assess the success of rehydration efforts as well as the adequacy of feeding. Weight gain in the face of fluid therapy without voiding could be an indicator of third space fluid accumulation. Thus, cats in clinic on IV fluids should be weighed at least twice a day; cats boarding or otherwise in the hospital should be weighed daily. The “grumpy” cat can be weighed in towel and, by subtracting the weight of the towel, we get the body weight with being minimally intrusive. Other uses for scales are to evaluate volume of urine produced by knowing the weight of the unused litter box and comparing it to the used box; a postage scale may be used to determine volume of blood in surgical swabs.

Urine collection: Agitation of the bladder just before collection of urine by cystocentesis provides a better sediment yield. Because sediment is heavier than urine and is gravity dependent, re-suspension of the sediment within the bladder is diagnostically beneficial. A low number of white blood cells, trace protein or the absence of bacteria should be interpreted with suspicion in dilute urine. A culture and sensitivity may be warranted when the specific gravity is < 1.025 in this situation. Conversely, when high numbers of bacteria are seen in a highly concentrated urine (e.g. usg > 1.050), collection induced contamination should be expected, especially when a mixture of rods and cocci are reported.

Blood pressure evaluation should be performed in every cat over the age of eight years and in any ill or anaesthetized patient. Hypertension is common in cats with renal insufficiency or with hyperthyroidism. Hypotension in an ill cat may signal hypovolemia or sepsis. During anaesthesia, hypotension precedes alterations in pulse oximetry and, if remedied promptly, can prevent hypoxemia from developing.

Hematocrit tubes provide vital information. Not only should the PCV and total solid (TS) be noted, but also the percentage buffy coat, as an estimate of massive white cell number changes and the character/colour of the serum. Icterus may be noted in the serum (or in the urine) before serum bilirubin rises or before it becomes evident in the pre-auricular skin, the conjunctive or the soft palate. Calculation of fluid rates for patients requires knowledge of the TS along with the PCV. These measurements should be taken minimally once a day; in more anemic and volume fragile patients, more frequent measurements are indicated. Like blood glucose measurement, blood for hematocrits may be collected by ear pricking with minimal annoyance for the patient.

Assessment of degree of dehydration should take all of the following parameters into consideration: skin turgour, eye position, mucous membrane moisture and TS as well as the character of their stool. Replacement of volume deficit plus maintenance requirements of 60 ml/kg/day should be calculated using the normal, hydrated weight not the ill weight. When prescribing subcutaneous fluid therapy as part of home care for a patient (for constipation, renal insufficiency, etc.), assuming the patient is adequately rehydrated, the volume to be given at home should be 60 ml/kg/day, not an arbitrarily assigned 50, 100, 150 ml/day based on the size of the cat.

Intubation of cats can be easily accomplished without the use of a laryngoscope, which can be cumbersome. With the assistant holding the cat's mouth open with one hand (hand over head, fingers at angle of jaw), she/he pulls the skin over the larynx rostrally. Simultaneously, the person intubating pulls the tongue forward and down, exposing the laryngeal folds. These are numbed with a drop of lidocaine and then the lubricated cuffed endotracheal tube is easily slid into the clearly visualized opening.

Bronchopulmonary disease diagnostics requires the harvesting of airway secretions for cytologic and microbiologic evaluation analysis for differentiation and diagnosis of the various causes of coughing and/or wheezing in the cat. Tracheal wash is readily available to all practitioners and samples the contents of the larger airways. Using a sterile endotracheal tube is less stressful than the traditional trans-tracheal technique. Pass a 3-5 Fr. red rubber feeding tube through an opening made in the end of its packaging, through the endotracheal tube until slight resistance is met. Flush two 6 ml aliquots of nonbacteriostatic physiologic sterile saline and aspirate the wash back into a sterile collection syringe. Repeat this procedure until 6-12 mls of saline have flushed the airways. Submit some of the collected sample on air-dried slides, in an EDTA tube as well as in a sterile red top tube for culture, should the fluid cytology show significant organisms. The presence of Simonsiella bacteria or squamous cells indicates oropharyngeal contamination.

Transfusions are an underutilized therapeutic modality. They are simple and life-saving as whole blood provides not only oxygen carrying capability of the red blood cells, but also platelets to initiate clotting, coagulation factors, oncotic properties of albumin to raise blood pressure, electrolytes, nutrients and white blood cells to fight infection.

It is important not only to blood type the recipient and use a suitably typed donor, but also to cross-match the potential donor to the recipient. There are too many type B cats in the population to not blood type and because of numerous alloantibodies as well as antibodies to things a cat has been exposed to, we mustn't err by not cross-matching. Either small blood bags can be used or 12 or 20ml syringes with CPDA1 added. The PCV and TS of both the donor and recipient are needed. With this information, the ideal amount of blood to be given may be calculated. Mostly one collects 40-50ml from the donor and gives the entire unit. An 18G needle and extension set (rinsed with CPDA1) or butterfly catheter can be used for collection from a sedated donor. A three way stop cock or one-way valve is helpful for changing syringes during collection. An in-line pediatric filter is needed for the administration of the blood. The most important thing (other than typing and cross matching) is that the human team are all relaxed. This is not a difficult procedure!

Donor requirements:

- Retrovirus and mycoplasma negative
- Good health, good body weight, well hydrated
- High PCV with normal TS

Care of donor after collection:

- Subcutaneous or IV fluid therapy
- Iron orally or by IM injection
- Good nutrition...and a treat!
- LOTS OF TLC

Care of the recipient after transfusion:

- Administer the transfusion over 1-2 hours and monitor body temperature, RR and attitude closely during transfusion.
- Check a PCV and TS after 24 hours

Bone marrow taps are another procedure that may intimidate some practitioners in the relatively smaller feline patient. The author uses 16G needles rather than a Jamshedi needle and readily harvests both a bone corer as well as marrow for evaluation of marrow diseases. Sites that may be used for collection are the femur, medial to the greater trochanter, the wing of the ilium or the humerus. After surgical prep the samples collected should be placed into EDTA tubes, at least 6 slides should be made and air-dried and the

bone core placed into formalin in a red top tube. Be sure to collect a blood sample for a CBC at the same time to evaluate how the cells are being released into the periphery.

Analgesia has thankfully come of age in veterinary medicine. We now have numerous types of agents that we can use safely in cats. The American Animal Hospital Association (AAHA) and the American Association of Feline Practitioners (AAFP) have jointly created Pain Management Guidelines in 2006. The International Veterinary Academy of Pain Management is an excellent resource (<http://www.ivapm.org/>). Whether we choose opioids, NSAIDs, antidepressants, antiseizure meds or acupuncture, pre-emptive analgesia is preferable to alleviation once pain has occurred. Inadequately controlled pain may cause modifications to the sensory system that result in an exaggerated pain response. Conditions that would be painful for us are likely painful for our patients. Pain is an experience that varies greatly between individuals. It is not only unpleasant but also deleterious to health, interfering with recovery and possibly resulting in death. If clients believe their cat is suffering, they are more inclined to consider euthanasia. If recovery is delayed, hospitalization costs increase, which may also influence the client's frame of mind and emotional state. Two references worth having are the Colorado State University (CSU) Feline Acute Pain Scale (www.ivapm.evetsites.net/refId,20467/refDownload.pml) and ISFM and AAFP Consensus Guidelines Long-term use of NSAIDs in cats (www.linkinghub.elsevier.com/retrieve/pii/S1098612X10001579).

Conditions commonly seen in feline patients which we may not routinely provide analgesics for include lower urinary tract disease (LUTD), pancreatitis, and degenerative joint disease (DJD). In LUTD, antispasmodics may be beneficial and humane along with an anti-inflammatory agent. DJD requires the use of agents that can be given long-term, such as judiciously dosed NSAIDs, glucosamine and chondroitin sulphate and acupuncture if available and tolerated. A wonderful resource for learning about the recognition and alleviation of pain is: Pain H.U.R.T.S. available through www.jonkar.ca/RPain/.

Recently aerosol inhalers (for both steroids and bronchodilators) have been recommended and used with success clinically in small animal medicine. Fluticasone is an inhaled steroid, which comes in 3 dose strengths (44, 110, 220 mcg/dose). Beta₂-adrenergic agonists come in a selection of albuterol, salmeterol or terbutaline. These may be delivered with the use of an Aerokat (www.aerokat.com) held over the cat's muzzle for 30 seconds. Drug delivery remains a significant question, both getting effective drug concentrations into the affected airways as well as avoiding excess drug/the potential of overdosing these small animals. There is an excellent website resource for clients to learn more about their asthmatic cat and use of inhaled medications: <http://www.fritzthebrave.com/>

Tips on aerosol use:

- Acclimate kitty to device over several days, letting him/her investigate it.
- Reward fearless approaches to device and start placing it near kitty's face. (Praise, food, catnip, stroking?)
- Practice with the mask over the cats face without anything in the chamber
- Pre-load the chamber with a puff of albuterol (in addition to the dose required)
- Make sure the mask is over the muzzle for 4-6 breaths
- Administer bronchodilator (albuterol) first, to allow better delivery of corticosteroid

In the patient who is nauseous and swallowing frequently, esophagitis or gastritis may be suspected. Administration of famotidine SC along with an oral bolus of sucralfate suspension will make the kitty much more comfortable for examination.

As well as medical therapy for pruritis, the cat with itchy skin will benefit if SoftPaws™ (www.softpaws.com/) are applied to the nails of their back (+/- front) feet.

As cats age, they tolerate less time in the clinic. Siamese cats are especially prone to depression. Three days is about as long as a cat can stand the indignities of hospitalization, even with daily visits from his/her person. Because cats “see” the world in overlapping clouds of smells, we must provide familiar smells and aim to reduce foreign, medicinal smells wherever possible. Client worn shirts are helpful in their cages/beds. Because their sense of hearing is tuned more finely than ours, we must keep as quiet and reassuring environment as possible. They should not be exposed to the sounds of predators, namely barking dogs. Certain induction agents enhance their sense of hearing, e.g., ketamine, so a safe sounding environment should be achieved. Changing diet while hospitalized is likely to result in inappetence and the development of an aversion, thus if a change in diet is required therapeutically, try to make that change at home, in a gradual fashion.

Client care, i.e. care of the client, is essential to providing complete patient care. It is only through hearing and working with the client that we are able to offer the very best veterinary care.

Remember, in order to provide compassionate and effective care for cats, try to think like a cat. Imagine what their experience might be like. When we reach into a carrier or kennel, we are huge creatures, blocking the light. We smell wrong and don't sound familiar. Shushing reassuringly sounds like a hiss in cat. Remember that the less is more when restraint is required. Always leaving as much contact with the floor as possible; if collecting from a jugular in sternal position, have the forefeet touch the table; procedures requiring lateral recumbency are less frightening when the front end is sternal. Allow the client to be with the kitty as much and whenever possible. And don't forget that hissing, spitting, growling and posturing are all attempts to not have to strike or bite you. Cats avoid direct physical confrontation if possible.

Recommended reading

1. The Domestic Cat: The biology of its behaviour. Turner DC, Bateson P (eds) Cambridge University Press, 2nd ed., Cambridge, United Kingdom, 2000.
2. Crowell-Davis SL, Curtis TM, Knowles RJ. Social organization in the cat: a modern understanding. J Feline Med Surg 2004; 6, 19–28.
3. Hide Perch Go and Cat Sense <http://www.sPCA.bc.ca/welfare/professional-resources/catsense/>
4. Gourkow N, Fraser D. The effect of housing and handling practices on the welfare, behaviour and selection of domestic cats (*Felis sylvestris catus*) by adopters in an animal shelter. Animal Welfare 2006, 15: 371-377
5. www.healthycatsforlife.com
6. Rodan I, Sundahl E, Carney H, et al. AAFP and ISFM Feline-Friendly Handling Guidelines. J Feline Med Surg 2011; 13, 364-375.

Figure 1: Body posture


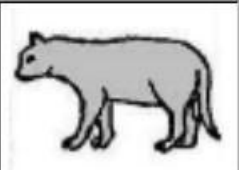
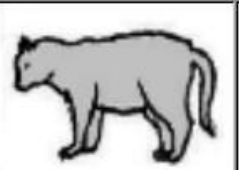
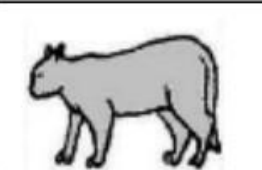
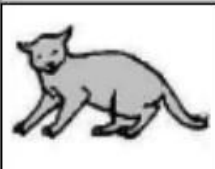

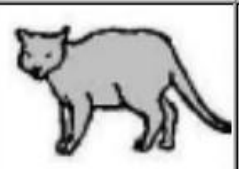
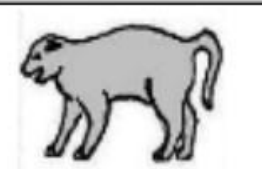

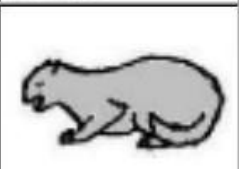
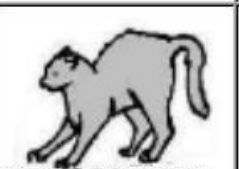





| | | MORE AGGRESSIVE → | | | |
|---|--|--|---|---|--|
| MORE SUBMISSIVE OR MORE FEARFUL ↓ |  <p>TAIL MAY BE HELD ALOFT</p> |  |  |  | |
| |  |  <p>FLATTER TO THE GROUND</p> |  |  | |
| | <p>"FLINCH"</p>  <p>MAY EVEN FALL OVER IN SUBMISSIVE FEAR</p> |  |  <p>MUSTN'T CONFUSE THIS WITH STRETCHING</p> |  <p>POSTURE ALSO SEEN WHEN CATS SPRAY</p> | |
| | <p>TOTALLY WITHDRAWN</p>  <p>TAIL TUCKED UNDER</p> |  <p>TAIL TUCKED UNDER</p> |  | <p>LAST DITCH</p>  <p>SCARED ANGRY</p> | |

Figure 2: Tail position


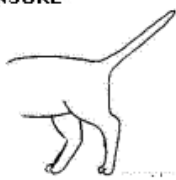
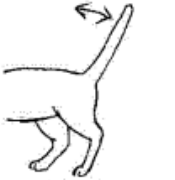

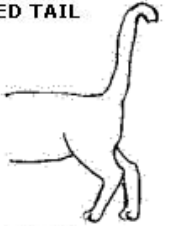



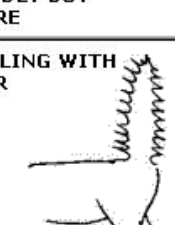
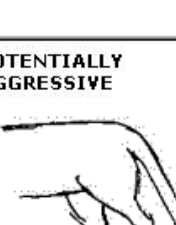



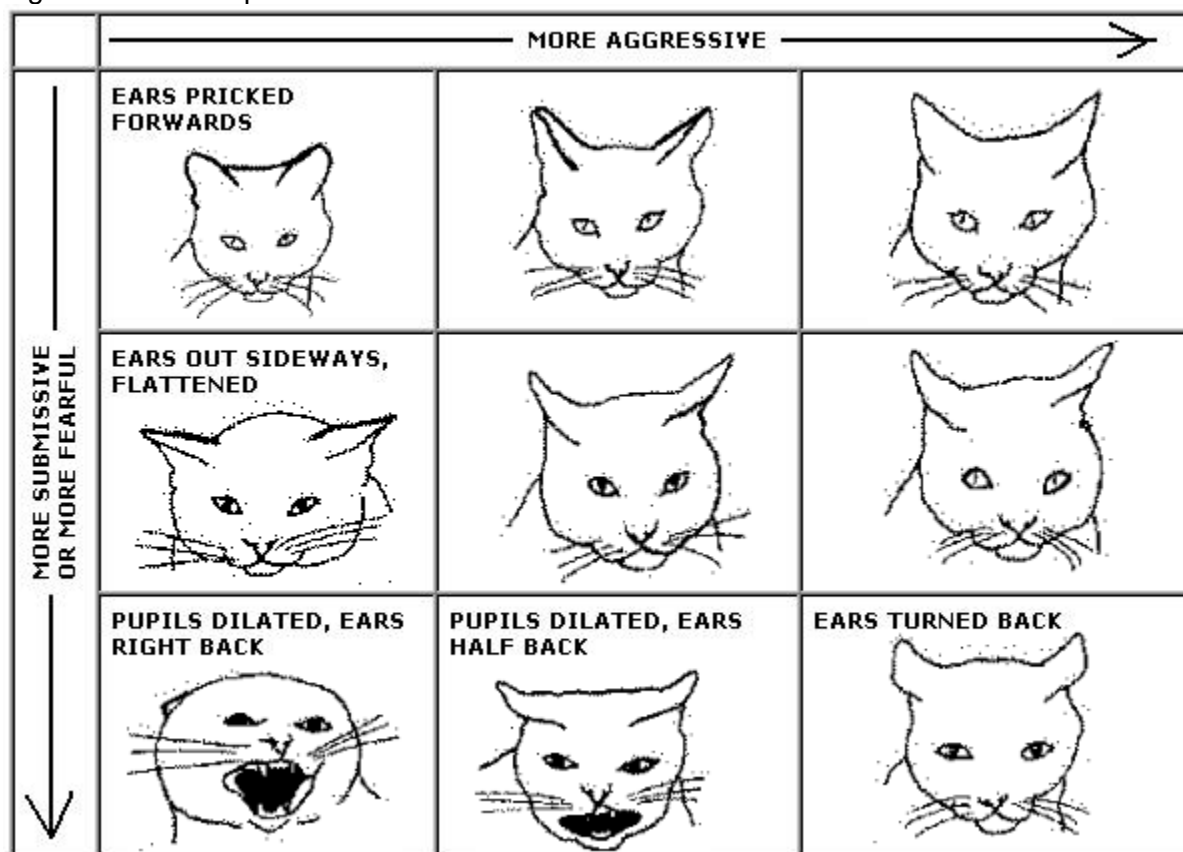
| | | | |
|---|--|---|--|
| <p>FRIENDLY, CONTENT</p>  | <p>NON-THREATENING, UNSURE</p>  | <p>DERISIVE "**** YOU"</p>  | <p>QUIVERING, VERY PLEASSED TO SEE YOU</p>  |
| <p>HOOKED TAIL</p>  | <p>AMICABLE, NOT AGGRESSIVE OR FEARFUL</p>  | <p>DEFENSIVE AGGRESSION</p>  | <p>THRASHING TAIL, EXCITED OR ANGRY OR IRRITABLE</p>  |
| <p>FRIENDLY BUT UNSURE</p>  | <p>POTENTIALLY AGGRESSIVE</p>  | <p>SUBMISSIVE</p>  | <p>TWITCHING TAIL - ALERT, INTERESTED</p>  |
| <p>BRISTLING WITH ANGER</p>  | | | |

Figure 3: Facial expressions



Cat vocabulary as per **CAT CHAT! CAN CATS TALK?** Copyright 1995 - 2009 Sarah Hartwell (http://www.messybeast.com/cat_talk.htm)

Kittens:

- Mew (high pitched and thin) - a polite plea for help
- MEW! (loud and frantic) - an urgent plea for help

Adult cats:

- mew - plea for attention
- mew (soundless) - a very polite plea for attention (this is Paul Gallico's "Silent Miaow" which is probably a sound pitched too high for human ears)
- meow - emphatic plea for attention
- MEOW! - a command!
- mee-o-ow (with falling cadence) - protest or whine
- MEE-o-ow (shrill whine) - stronger protest
- MYUP! (short, sharp, single note) - righteous indignation
- MEOW! Meow! (repeated) - panicky call for help
- mier-r-r-ow (chirrup with liting cadence) - friendly greeting

Tomcats:

- RR-YOWWWW-EEOW-RR-YOW-OR - caterwaul
- merrow - challenge to another male
- meriow - courting call to female

Mother cats:

- MEE-OW - come and get it!
- meOW - follow me!
- ME R-R-R-ROW - take cover!

mer ROW! - No! or Stop It!

mreeeep (burbled) - hello greeting to kittens and disarming greeting to adult cats (also used between adult cats and humans)

There is more to feline than the simple miaow though. In 1944, Mildred Moelk made a detailed study of cat vocabulary and found sixteen meaningful sounds, which included consonants and vowels. She divided cat-sounds into three groups:-

murmurs made with the mouth closed

vowel sounds made with the mouth closing as in "iao"

sounds made with the mouth held open.

Although these may not be used in grammatical sentences, one definition of language is "any means, vocal or other, of expressing or communicating feeling or thought" (Webster's Dictionary). Observant owners will notice the following sounds which cats make to communicate their state of mind (this list is not exhaustive, since cats will improvise):

Caterwaul - cat wants sex!

Chatter - excitement, frustration e.g. when prey is out of reach or escapes (involves rapid teeth-chattering jaw movements)

Chirrup - friendly greeting sound, a cross between a meow and a purr! (friendly greeting sound with rising inflection; familiar to most cat owners)

Cough-bark - alarm signal (rare in pet cats); like us, cats can cough both voluntarily and involuntarily)

Growl - threat, challenge, warns others to go away

Hiss (with or without spit) - threat, fear, warns others to back off

Meow - general-purpose attention seeking sound used by adult cats to communicate with owners or with kittens

Mew (of kittens) - distress, hunger, cold (to attract mother's attention)

Purr - contentment, relaxation, also to comfort itself if in pain (cats in extremis may purr); a loud purr invites close contact or attention

Scream - fear, pain, anger, distress

Squawk - surprise, shock (somewhat strangled sound)

Yowl - a threat, offensive or defensive, but also used in a modified form by some cats seeking attention when owner is out of sight

Idiosyncratic sounds - a sound which a particular cat uses in a particular context.