Why are(n't) you using pheromones in your hospital ward? There's more to reducing patient stress

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ABSTRACT

There is more to managing in-patients' stress than providing pheromones. Enriching the hospital cages is good science and easy to do. It can also help more of your patients and make your job easier. I illustrate these points by examining:

- Ethological reasons why hospitalisation is stressful;
- Sensory reasons why hospitalisation is stressful;
- The research on management of stress in caged dogs and cats;
- The practical consequences for us of stress in our in-patients;
- The growing emphasis on psychological and physical environment in the approach to human hospital care; and
- The research on pheromone applications in veterinary hospital settings.

I conclude that going beyond pheromones is of benefit to patients, staff, owners and practice finances alike

BACKGROUND

In companion animal practice, we often hospitalise animals. Many patients are only hospitalised for a day or two and the long-term benefit of this care is likely or certain. Perhaps for this reason, and because we are so busy solving the clinical problems, we have tended to accept that some of our patients will be (dis)stressed by hospitalisation. For example, we accept that some cats crouch all day in their litter trays or that some dogs stand at the front of their kennels all day panting or barking.

In more scientific terms, we accept that hospitalisation causes physiological changes such as increased heart rate, blood glucose and cortisol release which, in some cases, are associated with negative feelings such as anxiety, frustration and fear[1] manifested by behaviours such as those above. If persistent and aversive enough those feelings may constitute the mental state known as suffering[1].

Owners also accept that their pets may find hospitalization stressful. However, it is quite common to hear them say of their pet: "S/he used to love coming here until s/he came in to be 'done'." Those owners are aware that some aspect of the time spent at the veterinary hospital distressed their animal. In this article, I demonstrate why their hunch is correct and why there is more to managing in-patients' stress than providing pheromones. I give an overview of:

- Ethological reasons why hospitalisation is stressful;
- Sensory reasons why hospitalisation is stressful;
- The research on management of stress in caged dogs and cats;
- The practical consequences for us of stress in our in-patients;
- The growing emphasis on psychological and physical environment in the approach to human hospital care; and,
- The research on pheromone applications in veterinary hospital settings.

I conclude that going beyond pheromones is of benefit to patients, staff, owners and practice finances alike.

ETHOLOGICAL REASONS WHY HOSPITALISATION IS STRESSFUL

When we hospitalise animals, they have already been taken from their home territory and social group. They now find themselves in unfamiliar surroundings where they can neither predict nor control what happens to them. They are dependent upon strange handlers, are in a new routine and are in a new sensory environment (see below). In a typical hospital cage, they have little opportunity to perform common coping responses to perceived threats or novelty i.e. variously to investigate, to hide or to climb/run away. This constraint on the performance of coping behaviours is likely to cause some animals to feel frustrated (they can't investigate), bored (nothing to do), anxious (potential and inescapable threats) or afraid (known threats - their earlier experience of the hospital has been negative - that they cannot escape or hide from.) In some cases, animals are feeling unwell e.g. in pain, weak,

nauseated. They also lack the capacity to interpret their situation cognitively e.g. knowing that they will soon return home.

All of these aspects of hospitalisation are likely to contribute to stress in our patients, some more than others depending on each animal's temperament and experience. The animals' sensory capacities likely contribute to this, as outlined next.

SENSORY REASONS WHY HOSPITALISATION IS STRESSFUL

The taste and touch preferences of dogs and cats are, respectively, well researched by the pet food industry and well known by individual owners. It is the senses of hearing, smell and vision where differences between us and our patients are most marked and easily overlooked. Further differences are found with pheromone signaling and, probably, perception of the passage of time.

VISION

Facts most pertinent to hospitalisation are:

- We have much greater visual acuity than our patients do. Specifically, "the visual acuity of the typical dog is about 20/75, and the average cat is between 20/100 and 20/200. This means that from 20 feet away, normal dogs could distinguish the details of an object that a person with normal vision could differentiate from 75 feet away."[2]
- Similarly, we are better able to accommodate than our patients are (i.e. to adjust our lens focus so as to see objects at different distances equally clearly). Cats probably cannot focus on objects that are closer than 26cm (~10 inches); with dogs, the estimated distance is 33-50cm (~1–2 feet).[2]
- Rabbits are thought to have limited need for accommodation[3]. They have panoramic vision but "cannot visualise the small area beneath the mouth"[3]. This is important in relation to trimming their incisors, especially given the noise of the equipment (see Hearing, below).

These aspects of patients' vision mean that dogs and cats in particular cannot clearly see distant or close people (or animals). However, they can smell and hear them (see below). For some animals, the inability to approach and find out more about the blurry person/animal that they can smell and hear, or to escape or hide from them, may be expected to contribute to frustration, anxiety, and aggression or other fearful responses which may be dangerous for handlers.

HEARING

Given a range of sounds of the same loudness (decibels), we cannot hear pitches above ~23kHz, whereas the upper limit for dogs is ~45kHz, for cats, ~75kHz, and for rabbits, 49 kHz[4]. Data comparing the auditory capacity of humans with other species are limited by small sample size[5]. However, existing data indicate that cats and dogs hear best at frequencies much higher than our optimal frequency and can hear ultrasound i.e. can hear above the limit of human hearing[4]. In addition, small mammals hear high frequencies more readily than larger mammals, but this is a between-species difference not a within-species difference[5]. Thus, while cats can hear much higher frequencies than dogs, there is minimal difference between a Chihuahua and a St Bernard[4].

This knowledge raises questions about how the noises from clippers, medical equipment, cleaning devices etc may sound to our patients and, for example, if some of the sounds may interfere with patients' rest. In human medicine — and in the experience of many of us as individuals — the adverse effect of noise on sleep is well recognised[7]. In the veterinary case, if an animal associates otherwise neutral sounds (e.g. clippers, dental equipment) with anxiety or fear or adverse experience and has no way of relieving those feelings, s/he may dislike future visits even for routine vaccinations if, as is likely, s/he again hears those same sounds (classical conditioning).

SMELL

Lindsay[8] and Miklosi[5] provide detailed reviews of canine olfaction. While comparative studies are limited by small sample sizes, those authors cite research indicating that the average surface area of human olfactory epithelium is in the order of 2-4cm^2, whereas in dogs it ranges from 20cm^2 to 200cm^2. Miklosi[5] cites one study where the minimum concentration of the chemical n-amyl-acetate that the human participants could detect was 10,000 to 100,000-fold higher than in the dogs tested.

It is not clear what the comparative olfactory ability is of either cats or rabbits. Assuming their gross nasal anatomy is similar to that of comparably small dogs, the surface area of feline olfactory epithelium may be in the region of ~20cm^2.

PHEROMONES

Whereas smells are detected through normal breathing, via the cilia in the nasal mucosa and the olfactory bulbs in the brain[8], the detection of pheromones is more complex. Briefly[5, 8-10], pheromone secretions also contain the pheromone's odour and the ancillary odours of the individual producing them. The smell of the pheromone (which may first be signalled to other animals visually e.g. by the presence of scratch marks) is detected by the olfactory bulbs. This then stimulates the opening of the vomeronasal organ through which the pheromone is then aspirated. In cats, aspiration is controlled autonomically and is achieved through flehmen behaviour. Washout of the vomeronasal organ then occurs autonomically. In

dogs, aspiration is thought to be achieved by tonguing whereby "the dog's tongue is pushed rapidly against the roof of the mouth, with the teeth sometimes chattering and expressing profuse foam sometimes collecting on the upper lip" (*sic*) [8]—presumably also under autonomic control.

The vomeronasal organ is innervated by three nerves that provide links to the limbic system, but not to the neocortex. It is not clear what the precise central neurological response is to pheromone stimulation. Grossly, however, animals detecting pheromones undergo changes in physiology and behaviour, associated with activity in the limbic system and the hypothalamus. [5,8-10]

PERCEPTION OF THE PASSAGE OF TIME

Besides animals' sensory experience contributing to feelings of stress, there is the question of how our patients sense and experience the passage of time. We know that they do not have the cognitive capacity to grasp the relative shortness or long-term benefit of a few hours or days in a veterinary hospital. This may mean that they live in the present. If so, it is a concern if they should experience the present as inescapable and unrelievable stress.

Having seen in principle why hospitalisation is likely to be stressful, we next look briefly at what research can tell us of that. Much of that has been conducted in animal shelters, but animals' experience of arriving there closely parallel arrival at the veterinary hospital.

RESEARCH ON STRESS IN CAGED DOGS AND CATS

Behavioural and physiological data from cats [11-16] and dogs[17-19] confirm that they find being taken from familiar territory and confined in a hospital or shelter cage more or less stressful. For examples, domestic cats were more stressed in the first few hours at a shelter than stray cats were [11], and the presence of dogs in shelters increased stress levels in cats there [14].

Behavioural indicators of stress include:

- In cats, inhibition of self-maintenance behaviours such as eating, grooming and eliminating; hiding under the bedding; crouching in the litter tray or corner of the cage and remaining constantly on the alert for potential threats (anxiety); dilated pupils; restlessness; and vocalisation [15,16].
- In dogs, inhibition of self-maintenance behaviours as above; panting; yawning; licking the lips; digging; auto-grooming; paw-lifting; remaining at the very front, or very back, of the kennel; restlessness; vocalisation (whining, howling, barking); and a lowered body posture [17-19].

(Such behaviours are not pathognomic for the feelings, just as pyrexia is not pathognomic for infection. In both cases, the signs are cause for a high index of suspicion but their interpretation requires understanding and context.)

THE PRACTICAL CONSEQUENCES OF STRESS IN OUR IN–PATIENTS

Stress-related behavioural inhibition has consequences for in-patients, their owners and our workload as well. If otherwise healthy animals are too inhibited to urinate or eat (in rabbits, relatively short periods of inappetence can be of major consequence), interventions like cystocentesis, use of (off-label) appetite stimulants or ongoing hand-feeding may become necessary. Use of these requires unplanned-for time, risk-benefit calculations, additional cost and further informed consent.

When in-patients are afraid, they may freeze, making their manipulation and movement difficult for us. Other frightened animals may become very aggressive, creating immediate dangers for themselves and staff, and potentially limit the clinical care that we can provide. Barking dogs may be particularly disruptive to other patients and to staff. Frustration may contribute to animals chewing through dressings, sutures and giving sets.

If persistent over the long-term, stress can adversely affect healthy animals' immunity, general health, and behaviour[20] (e.g. feline idiopathic cystitis). For some feline patients, anecdotal evidence indicates that the stress of having been hospitalised can continue for some hours or days after a cat's return home, with the cat hiding, not eating, and showing aggression[21].

In human beings, hospitalization can also cause stress with short- and long-term effects on patient outcomes [7].

THE APPROACH IN HUMAN HOSPITALS

Empirically we know that being hospitalised can be stressful for people of all ages. This is becoming more widely acknowledged and studied after pioneering research by Roger Ulrich and others in the US and elsewhere [e.g. 22]. In 2011, the Board of Science of the British Medical Association provided a review and recommendations on the psychological and social needs of patients [7]. One recommendation was that "(hospitals) should promote wellness by creating physical surroundings that are psychologically supportive."

In Ireland, this concern to minimise in-patient stress is seen in the plans for the New Children's Hospital, which included consultation with children about what would make the experience better for them [23].

TO SUM UP SO FAR

We have looked at ethological and related physiological reasons why hospitalisation may be expected to stress our patients to varying degrees. We've also seen what their common behavioural responses to stress are and how those can be problematic for patients and staff alike. Finally, we've seen that reducing patients' stress is recognised as important in human hospitals. The next section of this article considers the evidence for using pheromone applications to manage stress in veterinary in-patients.

THE RESEARCH ON PHEROMONE APPLICATIONS IN VETERINARY HOSPITAL SETTINGS

(NOTE: A review of the research on and use of pheromone applications in the domestic setting is outside the scope of this paper.)

The principle of keeping confined animals humanely is to provide them with some control over their environment and to allow them to perform some of their more highly motivated behaviours [25]. It is likely that the performance of species-typical behaviours is rewarding in itself i.e. as much as or more than the fruitfulness of the behaviour[24,25]. In the case of stressed patients, an example may be having the facility to hide even though this does not remove the animal from the surrounding noises and smells that are causing the stress. However, any informal review of practice websites in Ireland, the UK and North America suggests that most practices do not routinely provide such facilities for their patients, and that many rely instead on pheromone diffusers or sprays (Feliway® and Adaptil®; CEVA, Amersham, Buckinghamshire.)

FELIWAY®

Feliway® is a synthetic analogue of the F3 facial pheromone which is one of five secreted by glands in the cat's chin, lips, vibrissae area, and cheeks [9,10]. Cats deposit F3 on their surroundings when they rub their cheeks along them. They seem to prefer edges for this (a reason for providing them with a box within the cage, supported also by behavioural and physiological evidence that such environmental addition lowers stress in newly arrived and longer-stay caged cats [11,12]). The F3 pheromone seems to enable the cat subsequently to distinguish those areas that are its territory from those areas that are not. This is thought to reassure the cat about the area in which it finds itself.

To my knowledge, there is only one peer-reviewed paper describing an original study of the efficacy of Feliway® in hospitalised cats [26]. That paper examined the use of Feliway® spray in cages of hospitalised cats — some healthy, some sick — in two studies. Both studies were double-blind but not adequately randomized (alternated assignment) given the small sample sizes (n=20); health status was not taken into account in the analysis, although the small sample size probably precluded this. The reliability of the data was not reported and Type 1 error not controlled for. In the first study, bedding was sprayed with Feliway® or placebo 30 minutes before cats were placed in the cages. Statistically significant and marked numerical increases were noted in episodes of facial rubbing, grooming, lying, and interest in food but not in food consumption with Feliway®, compared to placebo. In the second study, all cages were sprayed with Feliway® and half had a cat carrier in the cage. Food intake was increased significantly (three-fold) in the former group, but it was not possible to draw conclusions about the contribution of Feliway® to that because it was not controlled for. The limitations of these studies and apparent lack of other research in the area make it difficult to know if Feliway® reduces stress in sick or healthy in-patients.

Adaptil® (Dog Appeasing Pheromone) is a synthetic version of a pheromone that is present in sebaceous gland secretions from the intermammary sulcus, during a period from three to four days after parturition to two to five days after weaning [8-10]. It is unclear why or if weaned dogs retain the capacity to detect that pheromone: in the wild, it would seem to have little adaptive value.

The mode of action of Adaptil® is unclear but may be related to effects on prolactin, which in turn may have a role in anxiolysis [27]. There seems to be little published research on the use of Adaptil® in the veterinary ward area. A recent paper examined the use of Adaptil® spray for managing pre-operative stress in 46 dogs taken to a veterinary teaching hospital for routine neutering [27]. The study was appropriately randomised, controlled and double-blind; the outcome measures were behaviours and clinical and biochemical markers including prolactin. The authors controlled for Type 1 error and demonstrated high inter-observer reliability in the behavioural measures. They noted statistically significant differences in prolactin and "alertness and visual exploration behaviors after surgery". However, it is not clear what the numerical changes in those behaviours were, or if any of the statistical differences were clinically significant.

Another recent study [28] examined the effect of Adaptil® diffuser in 43 dogs over four days in a veterinary ward. Those authors reported "overall amelioration of separation-related behavioral signs in the DAP-treated group". That study was controlled and double-blind, but not properly randomised (alternate assignment); also, it is not clear whether the statistical method was applied correctly or what the reliability of the data was. It remains unclear whether the reported improvement in the behaviours was clinically significant or a Type 1 error.

SO, SHOULD YOU USE PHEROMONES IN THE WARD AREA?

Pheromone applications do not and cannot address the principal cause of patients' stress i.e. the lack of environmental control and predictability. Moreover, there is not yet enough adequate research to support a reliance on pheromones to manage in-patients' stress. The published research [26-28] does not satisfy the following *a priori* objections to the likelihood of efficacy there:

- Pheromone secretions are complex. They include the individual's particular protein marker / scent which is one of the factors that stimulate opening of the vomeronasal organ in the animal detecting the pheromones. It is impossible to supply those markers in the commercial products [10]. For this reason, the products contain high concentrations of the synthetic pheromones [10]. However, it remains unclear whether that is enough to stimulate opening of the

vomeronasal organ and then the necessary aspiratory behaviour.

- Aspiration into the vomeronasal organ requires flehmen in cats and tonguing in dogs [8-10]. While these apparently crucial behaviours may be difficult to detect, the studies on pheromones described above did not report measuring them [26-28]. Anecdotally, the behaviours are not apparent in in-patients kept in wards where pheromone applications are used. This may be because no one sees the behaviours (or doesn't remark on them). Another possibility is that the behaviours are not taking place much or at all perhaps because of the absence of associated odour molecules and / or because the animals' motivation and energies are directed towards scanning and coping with the unpredictable, uncontrollable hospital environment and the new sensory input it provides. It is true that, if pheromones are in fact helpful to some patients, only one bout of aspiration into the vomeronasal organ may be enough. At present, however, none of this is clear.
- Diffusers would seem unlikely to provide adequate concentrations of pheromones within hospital cages.
- The manufacturer notes "Never use strong smelling disinfectants, bleach, biological washing powder, detergents or deodorisers to clean the affected (sprayed) areas. They may interfere with the action of Feliway®" [29]. This suggests that any impact of Feliway® (and presumably Adaptil®) sprays might be reduced because cages and bedding will have been washed in biological detergent and / or bleach or other disinfectants.

CONCLUDING REMARKS

As with clinical work, reading or writing a review such as this always risks motivated reasoning. That is, "the clinician or academic authority tries to minimise negative and maximise positive feelings. Think about this next time you read a review by an authority."[30].

I maintain nevertheless that, while research on more enriched caging is also scant and some reports have also shown methodological limitations, the current weight of logic and evidence remains more in favour of enriching our hospital cages than in relying on pheromones. I also argue that, in light of all the physiological and ethological reasons why hospitalisation is stressful, and of the examples set by human hospitals [7,22], animal shelters, zoos and laboratories [24], providing our in-patients with more environmental control seems an essential part of modern care and more logical than relying on pheromone applications. Examples include giving cats the option to hide and perch [12,13], and dogs the option to eat with Kongs[25]. Additional approaches are described elsewhere[31-36].

A cost-benefit analysis of implementing these approaches shows it to be 'win-win'. They cost little or nothing, are evidence-based, benefit patients, make our work easier, and increase our clients' peace of mind not least by following the lead in human medicine. Finally, being in-patient friendly is a powerful business strategy: with appropriate marketing, you can attract and retain more clients because helping reduce your patients' stress adds value at a time when this is paramount for many pet owners.

COMPETING INTERESTS

The author declares that she has no competing interests.

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From 2000 to 2006, Caroline Hewson was Research Chair in Animal Welfare at the Atlantic Veterinary College, Canada. Recommencing locum work in the UK in 2008, she discovered through surveying pet owners independently how much they value patient-friendly care. For a free strategy session on how your practice can attract and retain more clients by being more patient-friendly, email ch@carolinehewson.com

REFERENCES

Gregory NG: Physiology and Behaviour of Animal Suffering. Oxford: Blackwell. 2004: 12-21.

Miller P: Vision in animals - what do dogs and cats see? In Proceedings of the 25th Annual Waltham/OSU Symposium. Small Animal Ophthalmology: October 27—28, 2001; Columbus. 2001:1-4.

Donnelly T: Rabbit ophthalmology. In Proceedings Online of American Board of Veterinary Practitioners Symposium 2011: April 28 – May 1, 2011; St Louis. [www.vin.com/abvp/2011/].

Heffner HE: Auditory awareness. Appl Anim Behav Sci 1998, 57: 259-268.

Miklosi, A: Dog Behaviour, Evolution, and Cognition. Oxford: Oxford University Press; 2007: 137-150.

Heffner HE, Heffner RS: High-frequency hearing. In: Handbook of the Senses: Audition. Edited by Dallos P, Oertel D, Hoy R. New York: Elsevier; 2006: 55-60.

BMA Science and Education: The psychological and social needs of patients. January 2011. [www.bma.org.uk/images/psychologicalsocialneedsofpatients_tcm41-202964.pdf].

Lindsay S: Handbook of Applied Dog Behavior and Training. Vol 1. Adaptation and Learning. Ames: Iowa State University Press; 2000: 127-165.

Mills D: Pheromonatherapy: theory and applications. In

Pract 2005, 27: 368-373.
Pageat P, Gaultier E: Current research in canine and feline pheromones. Vet Clin Small Anim 2003, 33: 187-211.
Dybdall K, Strasser R, Katz T: Behavioral differences between owner surrender and stray domestic cats after entering an animal shelter. Appl Anim Behav Sci 2007, 104: 85-94.
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. Anim Welfare 2006, 15: 371-377.
Kry K, Casey R: The effect of hiding enrichment on stress levels and behaviour of domestic cats (Felis sylvestris catus) in a shelter setting and the implications for adoption potential. Anim Welfare 2007, 16: 375-383.
McCobb E, Patronek G, Marder A, Dinnage JD, Stone MS: Assessment of stress levels among cats in four animal shelters. J Am Vet Med Assoc 2005, 226: 548-555.
Kessler MR, Turner DC: Stress and adaptation of cats (Felis silvestris catus) housed singly, in pairs and in groups in boarding catteries. Anim Welfare 1997, 6: 243-254.
British Columbia Society for the Prevention of Cruelty to Animals: The Emotional Life of Cats (Booklet and DVD). Vancouver: British Columbia Society for the Prevention of Cruelty to Animals; 2004.
Välsänen AM, Valros AE, Hakaoja E, Raekallio MR, Vainio OM: Preoperative stress in dogs – a preliminary investigation of behavior and heart rate variability in healthy hospitalized patients. Vet Anaesth Analg 2005, 32: 158-167.
Rooney NJ, Gaines SA, Bradshaw JWS: Behavioural and glucocorticoid responses of dogs (Canis familiaris) to kennelling: Investigating mitigation of stress by prior habituation. Physiol Behav 2007, 92: 847-54.
Beerda B, Schilder MBH, van Hooff JARAM, de Vries HW, Mol JA Behavioural, saliva cortisol and heart rate responses to different types of stimuli in dogs. Appl Anim Behav Sci 1998, 58: 365-381.
Moberg G: The Biology of Animal Stress: Basic Principles and Implications for Welfare. Wallingford: CABI Publishing, 2000: 1-21.
Riccomini F: How to recognise feline stress in veterinary practice. VN Times 2007, 7(8): 10-11.
An Interview with Roger Ulrich [http://www.healthcaredesignmagazine.com/article/conversation-roger-ulrich?page=1]
Ireland's New Children's Hospital. Children's Consultation. [http://www.newchildrenshospital.ie/index.cfm/page/_for_parents].
Young RJ: Environmental Enrichment for Captive Animals. Oxford: Blackwell, 2003:147-151
Schipper LL, Vinke CM, Schilder MBH, Spruijt BM: The effect of feeding enrichment toys on the behaviour of kennelled dogs (Canis familiaris). Appl Anim Behav Sci 2008, 114: 182–195.
Griffith CA, Steigerwald ES, Buffington CAT: Effects of a synthetic facial pheromone on behavior of cats. J Am Vet Med Assoc 2000, 217: 1154-1156.
Siracusa C, Manteca X, Cuenca R et al: Effect of a synthetic appeasing pheromone on behavioral, neuroendocrine, immune, and acute-phase perioperative stress responses in dogs. J Am Vet Med Assoc 2010, 237: 673-681.
Young-Mee K, Jong-Kyung L, Abd el-aty AM et al: Efficacy of dog-appeasing pheromone (DAP) for ameliorating separation-related behavioral signs in hospitalized

dogs. Can Vet J 2010, 51:380–384.
How do I use Feliway? [http://www.feliway.com/gb/All-about-Feliway-R/How-do-I-use-Feliway.]
Leviton A: Motivated reasoning. Acta Paed 2007, 96: 949.
Hewson CJ: Stress in small animal patients: why it matters and what to do about it. Irish Vet J 2008, 61: 249-254.
Feline Advisory Bureau Cat Friendly Practice. [http://www.fabcats.org/catfriendlypractice/vets.html].
Wells, DL: A review of environmental enrichment for kennelled dogs, Canis familiaris. Appl Anim Behav Sci 2004, 85: 307–317
Wells, DL: Sensory stimulation as environmental enrichment for captive animals: A review. Appl Anim Behav Sci 2009, 118: 1-11
Heath S: Behavioural considerations for hospitalized patients. In Proceedings of the 54th Annual Congress of the British Small Animal Veterinary Congress: 31 March – 3 April 2011, Birmingham. Edited by BSAVA; 2011:116-118.
Yin S 2009. Low Stress Handling Restraint & Behavioral Modification. Techniques for developing patients who love their visits. San Francisco: CattleDog Publishing, 2009.

SELF-ASSESSMENT QUESTIONS

1. WHAT IS THE MAIN REASON WHY HOSPITALISATION IS STRESSFUL TO DOGS AND CATS?

a) They cannot see people closer than 20 feet away.
b) They can hear the full sound spectrum of the dental descaler.
c) They are in an unpredictable, uncontrollable environment.
d) They can't smell the pheromone applications in use there.

2. HOW DO DOGS AND CATS DETECT PHEROMONES? CHOOSE ONE OF THE FOLLOWING STATEMENTS:

a) They smell them, which leads to the opening of the vomeronasal organ.
b) They aspirate them into the vomeronasal organ by flehmen behaviour.
c) They open the vomeronasal organ through voluntary control mediated by the trigeminal nerve.
d) They smell them which causes opening of the vomeronasal organ. They then aspirate them into the vomeronasal organ which is controlled by central prolactin secretion.
e) They smell them which results in opening of the vomeronasal organ. They then aspirate them into the vomeronasal organ. Aspiration is under autonomic control.

3. A CLIENT BRINGS THREE RATS TO YOU FOR A CHECK-UP. AT HOME SHE ALSO HAS A DACHSHUND, A GREAT DANE AND A TABBY DOMESTIC SHORTHAIR CAT, ALL IN PERFECT HEALTH. THE RATS WRIGGLE A LOT WHEN YOU EXAMINE THEM BUT ARE IN GOOD HEALTH AND VERY QUIET. WHICH OF THE FOLLOWING ANSWERS IS/ARE CORRECT:

a) The rats did not vocalise during the consultation.
b) When the rats are at home, the Dachshund can hear them vocalising but the Great Dane cannot because it's a giant breed.
c) When the rats are at home, the Dachshund and the cat can hear them vocalising. The Great Dane cannot because it has the largest head.
d) Because dogs cannot hear above ~45kHz, when the rats are at home only the cat can hear them vocalising
e) None of the above. .

4. WHICH OF THE FOLLOWING IS CORRECT: IF CANINE IN-PATIENTS ARE STRESSED THEY MAY

a) Withhold urine.
b) Not eat.
c) Bark.
d) Chew their dressings.
e) Be quite easy to examine because, while tense, they do not move.
f) Show any of the above alone or in combination.

5. A CLIENT ARRIVES WITH HIS RELUCTANT GOLDEN RETRIEVER AND COMMENTS "HE USED TO LOVE COMING HERE UNTIL HE CAME IN TO BE 'DONE'." DO YOU:

a) Review the surgical notes including perioperative pain management (and client compliance with same, as necessary) and reassure the client accordingly.
b) Call a practice meeting to discuss making tramadol part of your spey-neuter management.
c) Make a non-committal, sympathetic reply, and crack on with the consultation.
d) Make a mental note to start including Adaptil collars in the spey-neuter package.
e) Sympathise, and then reassure the client about the enriched caging and patient-sensitive care which you provide and explain that, while you cannot prevent stress completely, the research is ongoing and practice policy is keeping up with appropriate new developments as they emerge.
f) Review your hospital care and see if there is anything else you can do to reduce sensory and environmental causes of stress.

Answers: 1. C, 2. E, 3. E (In aversive situations, rats make ultrasonic alarm calls of ~22kHz, so it is possible and perhaps likely that some or all of them vocalised during the consultation, but you could not have heard this. When you tickle the tummy of young rats they vocalise--at ~50kHz—just as human infants and other humans do. Many of these rats then solicit tickling behaviour from the handler. The conclusion is that these rats, like humans, "giggle" when tickled and enjoy it.), 4. F (although barking dogs(c) may be less likely to freeze during examination (e)), 5. One or more of a., e., and f.