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From 2000 to 2006, Caroline Hewson was Research Chair in Animal Welfare at the Atlantic Veterinary College, Canada. Resuming locum work in 2008, she surveyed pet owners and found that those participants valued a patient-friendly hospital environment more than clinical features, such as an in-house laboratory. Caroline continues to wrestle with how to balance clinical efficiency with a holistic approach to client and patient care.

Evidence-based approaches to reducing in-patient stress – Part 1: Why animals' sensory capacities make hospitalization stressful to them

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ABSTRACT: How many times do clients remark, "S/he used to love coming here until s/he came in to be 'done'"? Like us, clients know that hospitalization can be stressful for their animals. While stress is not a bad thing, animals' attempts to cope with it can make them more difficult for us to handle. Furthermore, their stress can become 'distress' if their environment is unpredictable and does not permit them to perform effective coping behaviours. This article is the first in a series of three that review why hospitalization is stressful and what evidence-based approaches you might use to help minimize stress. Part one summarises the ethological and physiological reasons why hospitalization is stressful.

Most people dislike having to stay in hospital. Primary reasons are that they can no longer control their environment, and may experience pain, embarrassment and so on. This causes some degree of stress-physiological changes such as increases in heart rate and blood glucose, and related feelings that are often (but not always) negative (Moberg 2000, Gregory 2004).

Although the stress response is normal in the short term, it can adversely affect patient health and recovery, especially if stress becomes chronic (British Medical Association 2011). That's why a recent report by the British Medical Association (2011) recommended that '(hospitals) should promote wellness by creating physical surroundings that are psychologically supportive'.

Evidence

Comprehensive data are lacking on the effect of cage confinement on the health and recovery of veterinary patients; however, anecdotal evidence and research to date indicate that hospitalization can have negative effects. For example, in a randomized study of cats newly arrived

at a shelter, Gourkow and Fraser (2006) compared the traditional 'barren' cage with one containing a box that cats could hide inside or perch on.

Twenty six per cent (8/31) of cats in the traditional housing were sent to isolation because of illnesses (undescribed), compared to 12 per cent (4/34) of cats in the enriched housing. Those preliminary findings appear to support the notion that the stress of caging can reduce an animal's immunity.

In veterinary wards, however, stress reduction is not typically a priority. This is understandable, for several reasons. First, many practices have had to adapt existing spaces to create the ward. Cost and clinical efficiency have, rightly, been primary concerns. Moreover, much of the research on stress in companion animals is published in non-clinical, academic journals, so practices are not aware of it.

Also, practices are busy places. Most animals are only hospitalized for one or two days, and any signs of stress are either ignored or circumvented so everyone can get through the 'ops list' as quickly as possible.

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However, in-patient stress causes unnecessary difficulties for the animals, their owners and our workload. For instance:

- if in-patients cope with stress passively (with behavioural inhibition, for example), they may not urinate or eat. We then have to undertake extra interventions such as cystocentesis, giving off-label appetite stimulants, and feeding by hand or tube.
 - All of these create more work and expense, including new risk-benefit calculations and, often, the need to contact clients for further consent – to use off-label drugs, for instance.
- similarly, when in-patients ‘freeze’ in response to stress, they can be difficult to move, handle and treat.
- other in-patients may respond actively to stress:
 - frightened animals can be aggressive, creating dangers for themselves and us, and potentially limiting the care that we can provide
 - frustrated dogs may bark continually, which is disruptive to other patients and to staff
 - frustrated animals may chew through dressings, sutures and giving sets, putting themselves at risk of infection and dehydration, and increasing the cost to their owners.

These everyday examples illustrate that minimizing stress in in-patients is important for humane and practical reasons.

The rest of this article looks at the science behind why hospitalization is stressful.

Ethological reasons

(Gregory 2004, Young 2003)

From an animal's point of view, hospitalization involves:

- being taken from her/his home territory and social group, usually by car which may be exciting (positive stress) or alarming (negative stress).
- at the clinic, being separated from her/his owner and taken away by someone who is, often, unfamiliar or is associated with previous stress such as an injection
- arrival in the ward area which is, often, either unfamiliar or has represented a negative experience in the past

- having little opportunity to perform common coping responses – to investigate, to hide, or to get away.

The result of this is that some in-patients feel frustrated. Others feel bored (nothing to do), anxious (their senses inform them of potential threats) or afraid (an earlier experience of the hospital was negative, so the ward is a known threat).

In addition to those negative emotions, many in-patients may already also have negative physical feelings, such as hunger, pain and nausea.

If any of the above negative experiences persists and the animal cannot resolve it – whether because of their ill-health or because the ward environment does not permit it – they may develop the complex mental state known as suffering.

A further difficulty is that animals cannot interpret their situation cognitively – knowing that the present stress is for their long-term benefit, or that they will soon return home. Therefore, unlike us, they cannot put their experience in context.

Research confirms that these are all reasons why our in-patients experience some degree of stress and may then display behaviours that make our work more difficult. Most of the research has been conducted in animal shelters, but there are many parallels with hospitalization. For example:

- most cats (Dybdall, Strasser & Katz 2007, Gourkow & Fraser 2006, Kessler & Turner 1997, Kry & Casey 2007, McCobb *et al* 2005) and dogs (Beerda *et al* 1998, Rooney *et al* 2007, Siracusa *et al* 2008, Välsänen *et al* 2004) find being taken from familiar territory and confined in a hospital or shelter cage stressful, on behavioural and physiological measures.
- domestic cats were more stressed in the first few hours at a shelter than stray cats were (Dybdall, Strasser & Katz 2007), probably because domestic cats are used to routine, not uncertainty. Also, the presence of dogs in shelters increased stress levels in the cats there (McCobb *et al* 2005).

The other main reason why hospitalization is stressful is that animals' senses are very different from ours.

Sensory reasons

It is easy to overlook the sensory impact of the ward on in-patients. The common

assumption is that if we find the ward environment tolerable, our patients do too. However, animals' senses of vision, hearing and smell are very different from ours. This means that they cannot clearly see things at a distance or very close up; but they can smell and hear them.

For some animals, the inability to approach and investigate the blurry person/animal that they can clearly smell and hear, or to escape or hide from them, creates stress that is problematic for them and, in turn, for us.

Vision

(Miller 2001, Donnelly 2011)

- Visual acuity – details that we can see from 30 to 60 metres are only visible to cats once they are six metres away. Similarly, dogs need to be six metres from an object to see the same detail that we see at 22 metres.
 - Accommodation – unlike us, our patients cannot adjust their lens focus so as to see objects at different distances equally clearly. For example, cats probably cannot focus on objects that are closer than 26 centimetres; whereas with dogs, the estimated distance is 33 to 50 centimetres.
- Rabbits are thought to have limited need for accommodation. They have panoramic vision but cannot see the small area beneath the mouth. This is important in relation to trimming their incisors, especially given the noise of the equipment.

Hearing

(Heffner 1998, Heffner & Heffner 2006, Miklosi 2007)

Our hearing is much poorer than that of our patients, and comparative data have been limited by small sample sizes. However, cats and dogs seem to hear best at frequencies much higher than our optimal frequency.

For example, given a range of sounds of the same loudness (decibels), we cannot hear pitches above ~23 kHz, whereas the upper limit for dogs is ~45 kHz, for cats, ~75 kHz, and for rabbits, ~49 kHz. This knowledge raises questions about how the noises from clippers, medical equipment and cleaning devices, for instance, may sound to our patients.

Another important clinical aspect is whether some of the sounds may interfere



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with in-patients' rest and sleep. In human medicine, adverse effects of noise on sleep and, in turn, on health, are recognized (British Medical Association 2011).

Smell

(Lindsay 2000, Miklosi 2007)

Again, comparative studies are limited by small sample sizes. However, the average surface area of human olfactory epithelium is estimated to be two to four square centimetres, whereas in dogs it ranges from 20 to 200cm².

In one comparative study, the human participants could only smell the test chemical when the minimum concentration was 10,000 to 100,000-fold higher than that which the dogs could detect.

It is not clear what the comparative olfactory ability is of either cats or rabbits. Assuming that cats' gross nasal anatomy is similar to that of comparably small dogs, the surface area of feline olfactory epithelium may be in the region of ~20 cm sq. This suggests that cats have a much stronger sense of smell than we do.

Pheromones

Pheromones permit signalling and communication between animals, usually members of the same species. Pheromone preparations, especially the feline facial pheromone (Feliway, CEVA), are a popular form of stress management in veterinary hospitals. Critical analysis of the published research, however, finds no robust evidence for such usage.

The second article in this series will examine this in detail.

Perception of passage of time

A further question about in-patient stress is how they sense and experience the passage of time. They are thought to lack the cognitive capacity needed to grasp the relative shortness or benefits of a few hours or days in a veterinary hospital. This may mean that they live in the present. If so, it is an ethical concern if they experience that present as inescapable and unrelievable stress.

Summary

We have looked at ethological and physiological reasons why hospitalization may stress our patients to varying degrees. In the light of these reasons, it seems unlikely that synthetic pheromone preparations would greatly relieve in-patient stress. The next article in this series examines the published research in that area.

The third article will consider environmental enrichment and its application in the veterinary ward. [vni](#)

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Further reading

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