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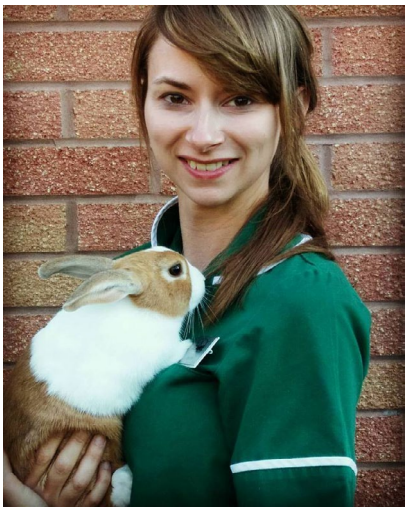

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Reducing stress in canine patients while hospitalised in a veterinary practice – a review part 2

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ABSTRACT: Part 1 explored the effect stress can have on our patients and some practices which can be implemented to reduce stress whilst at the hospital. Part 2 evaluates how well we can measure and perceive levels of stress and further ideas on how to limit and prevent stress, based on evidence-based research.

Keywords: cortisol; stress behaviour; music

Measuring levels of stress

Hekman, Karas, and Dreschel (2012) analysed salivary cortisol levels and behavioural parameters in 28 dogs hospitalised for elective procedures and a second group of 39 dogs as a control group. It was concluded that those in a hospital setting had significantly higher salivary cortisol concentrations than the second group and that lip licking and panting were seen more in those with higher salivary cortisol levels. This suggests measuring salivary cortisol levels is a reliable and useful way to measure stress levels as well as observing behaviour. Hekman et al. (2012) limited induced stress from restraint by completing saliva sampling within four minutes and using minimal restraint so as not to produce unreliable results.

Salivary cortisol levels were also used in a study by Bergamasco et al. (2010) when assessing stress levels in dogs kept in shelters. They concluded that salivary cortisol levels decreased and behavioural rate correlated showing a decrease in stress levels, supporting findings by Hekman et al. (2012) that measuring salivary cortisol levels is a reliable method of measuring stress. Alternatively, Riemer, Assis, Pike, and Mills (2016) produced a study measuring changes in dog ear temperatures in relation to stress as a non-invasive technique based on the association of cooling of the extremities during times of distress. Using infra-red thermography imaging cameras, six dogs were included in the study, concluding that temperatures of ear pinnae dropped during periods of stress. Riemer et al. (2016) acknowledged that this study comes with many limitations, including inadequate visualisation of the ears and heavy hair obscuring readings. Extensive further study of a larger study group is required before ear temperature could be relied upon, but does suggest a promising, non-invasive technique for the future. The idea of measuring temperature as a means of measuring stress was discussed by Part et al. (2014), who identified a drop in temperature in dogs when exposed to stress. A larger study group of 29 dogs were used, agreeing and therefore underpinning the findings of Riemer et al. (2016). Part et al. (2014) proceeded to include measures of urinary cortisol:creatinine ratio to assess stress levels; however, it is discussed that while these levels increase with stress, they may also increase during periods of excitement and after exercise and so have the potential to be misinterpreted. Conclusions from Part et al. (2014) supported the use of urinary cortisol:creatinine ratio readings, as they found levels to be significantly higher in dogs when exposed to stress in the kennel environment compared to at home.

DOI: 10.1080/17415349.2017.1412813

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The effect of music on stress levels

The use of music in reducing stress and anxiety levels has been heavily researched in people (Linnemann, Strahler, & Nater, 2016; Liu & Petrini, 2015; Gosselin, Holland, Mulcahy, Williamson, & Widacki, 2016). These theories have the potential to be applied in the veterinary setting with dogs to form part of a stress reduction protocol (Bowman, Scottish, Dowell, & Evans, 2015). Linnemann et al. (2016) produced a study spanning seven consecutive days, concluding with a positive result that listening to music did reduce stress, correlating with that found by Gosselin et al. (2016). Anxiety levels as well as physiological parameters were measured in 38 students, half of whom were used as a control group to improve reliability. Gosselin et al. (2016) confirmed that listening to music significantly reduced anxiety and increased performance in a test setting compared to the control group. It is suggested that listening to music resulted in reduced heart rate and blood pressure, maintaining a greater degree of physiological homeostasis. Adding further support to the use of music, Liu and Petrini (2015) identified in a study involving 112 individuals that the playing of music resulted in a significant decrease in pain, anxiety, blood pressure and heart rate compared to a control group. This has the potential to be transferred to veterinary medicine in not only reducing stress but forming part of a multimodal approach improving patient care and welfare.

A study conducted by Bowman et al. (2015) supported these conclusions: the playing of classical music over a period of seven days to 50 dogs in a kennel environment reduced signs of both physiological and psychological stress when compared to a silent control group. This study went further to state that by the second day of exposure, dogs became habituated to the calming effect of classical music, which may also be employed as an enrichment tool. Interestingly, Bowman et al. (2015) found that there was no significant difference between control and test groups in salivary cortisol levels, disagreeing with that found by Bergamasco et al. (2010) and Hekman et al. (2012). This suggests that further study is required in this area and that multiple parameters such as heart rate, blood pressure and behavioural scores should be used to assess stress levels as done by Bowman et al. (2015). Hewson (2014) discussed various ways by which to reduce stress, including playing music in the veterinary kennel environment, for which there are now purpose-made recordings of classical music used in the USA. This is further underpinned by a study conducted by Wells, Graham, and Hepper (2002), who concluded that playing classical music reduced stress by reducing barking and encouraging more time resting. This could be implemented in a veterinary practice and also to make staff aware of how much noise they may be creating which could inadvertently cause patients to become anxious.

Environmental enrichment

Hewson (2014) suggested environmental enrichment as a tool to reduce anxiety and stress and to allow for the potential for more positive interactions in the veterinary environment. Providing enrichment as described by Greenfield (2012) allows the patient to have an element of control in their environment, enabling them to interact more with their surroundings and perform behaviours important to them, be this via hiding, playing or chewing. By utilizing mental stimulation and enrichment techniques, a stress response can be reduced and concurrently the negative effects of stress on a patient also reduced (Greenfield, 2012). Hewson (2014) explained further how grooming of dogs if well socialised may reduce anxiety and allowed for positive experiences and a bond to be formed with the patient. This forms part of a holistic nursing care plan for in-patients, contributing towards a quicker recovery and shorter hospitalisation period.

Kry and Casey (2007) studied the effect on stress by providing a hide and perch box as enrichment for kennelled cats compared to an open bed which was used as a control. A stress score, approach test and scan sample were conducted daily over five days then again at day 14. Kry and Casey (2007) concluded that the enriched group showed decreased signs of stress and displayed more signs of relaxed behaviours such as sleeping, laying out and approaching the front of the kennel. Trevorrow (2014) agreed with the conclusions of Kry and Casey (2007): providing a box or place to hide aided in reducing stress which if not addressed, could have a negative effect both emotionally and on the physiological health of the patient. Although Kry and Casey (2007) and Trevorrow (2014) primarily discussed feline patients, the same principles can be extrapolated to canines, covering a portion of the kennel of a large dog or providing a suitable box for a small dog could aid in reducing stress in nervous patients.

Implementation of stress reduction plans

A stress reduction plan as endorsed by Carter (2014) is a useful tool in ensuring all staff involved in patient care consider holistic protocols such as providing a hide, or grooming the patient if this is suitable, providing mental stimulation. Carter (2014) explained further how staff, in particular RVNs, should consider their patient's perception of themselves. Speaking loudly, abruptly, moving bowls loudly could all echo around a kennel room, potentially interrupting a patient's rest or putting them on edge and increasing anxiety levels. Both Carter (2014) and Druce (2016) advocated the use of the pneumonic "HAPPY", covering Health of the patient, Anticipation (if the patient is anticipating what may happen then take the time to allow them to relax), Perception (how the patient is perceiving the handler, who may be loud or rushing and increasing anxiety levels), Peace (ensuring the patient has adequate times of quiet to sleep and relax) and You (how staff are in control of their patients and must ensure the best care possible is given). A stress reduction plan when used in conjunction with a nursing care plan ensures each patient is considered as an individual, taking into account temperaments as well as current illnesses and how potential problems can be avoided (Druce, 2016).

As well as understanding how to reduce stress, it is vital that signs of stress can be acknowledged by all staff to ensure that a thorough holistic care plan and stress reduction plan can be implemented. Druce (2016) listed indicators of stress in dogs to include panting and salivation, pacing or excessive activity, dilated pupils, inappropriate soiling of kennel, hiding, low tail position, anorexia, digging, body shaking, tachycardia and defensive aggression.

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Understanding signs of fear, anxiety and stress by participating in relevant continuous professional development (CPD) allows RVNs to act in a way to further reduce and minimise any signs of stress, while also striving for optimum levels of patient welfare (Greenfield, 2012). Williams (2016) extensively explained the importance of understanding behaviour in relation to cats and utilising minimal handling to limit and reduce stress, avoiding rough handling, sudden or erratic movements and loud noises can prevent sudden fearfulness and aggressive defence actions. The same principles can be used in dogs, especially those which are not as social and used to human contact. Adapting the approach to these patients and working in stages when procedures such as examinations or blood samples are required has the potential to have huge benefits on preventing a fear association and limiting a stress response. Scotney (2010/2011) explained the importance of staff being able to alter their behaviour depending upon each individual patient. This included avoiding direct eye contact with dogs, which may be seen as a challenging gesture.

Conclusion

An extensive range of ideas exist surrounding the concept of reducing stress in animals in a multitude of settings including transportation, moving home and while hospitalised within a veterinary practice. Based upon this literature review the use of valerian oil appeared to work well in reducing signs of stress and anxiety as did the playing of classical music, whereas the use of synthetic pheromones produced less-reliable and varying results. Measuring salivary cortisol levels appeared to be a reliable method in measuring stress in dogs as it correlated well with changes in behaviour in a number of separate studies; measuring ear temperature although another non-invasive technique, is too unreliable to draw firm conclusions from due to the interference of hair and ear shape of dogs.

RVNs play a huge role in this process. CPD involving evidence-based research is required by every RVN to ensure such ideas and research are explored. By understanding stress and how it may affect patients within an RVN's care, individual assessment of patients can be made and incorporated into a nursing care plan to ultimately result in a high standard of holistic nursing care, improving animal health, welfare and safety (Druce, 2016).

Recommendations for veterinary practice

Care of the canine patient could be improved in a variety of ways when being hospitalised within a veterinary practice. This can begin by the introduction of a stress reduction plan alongside the usual care plan a patient may have. A stress reduction plan encourages staff to not only think holistically but to also consider their patient's mental well-being in their present state and how this may help prevent a fearful association of a veterinary practice being formed. Patient interaction including grooming and stroking also appears to reduce stress. As part of the stress reduction and nursing care plan, a period of time each day should be allocated to include this to form part of the patient's daily routine.

The playing of classical music appears to reduce signs of stress shown by patients. Veterinary practices could include the playing of soft music in kennel areas in conjunction with other stress-relieving notions. The use of valerian oil products and synthetic pheromones could be implemented in all areas of a veterinary practice, with diffusers placed in areas where patients may be coming and going and a spray could then be used in kennel areas directly onto hospital bedding when patients are admitted and throughout their stay if boarding. A blanket or toy from home could then also be added to further reduce stress and provide a source of comfort.

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