

# Research Focus

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**This issue of Research Focus reviews the literature on the health benefits of interacting with companion animals and highlights areas of emerging research.**

## History of animals in healthcare

The potential of companion animals to benefit our health and well-being has been acknowledged throughout history. The domestic dog is the oldest domesticated 'pet' and has been associated with humankind for 35,000 years (Benda, 2004; Johnson et al. 2000; Catanzaro, 2003). There has always been some suggestion of interdependency between dog and human. The Greek god of healing, Asklepios, used sacred dogs and serpents to channel his divine energy; in the 1st Century, Pliny the Elder recommended the companionship offered by lap dogs and Hippocrates mentioned the value of horseback riding in a book chapter entitled 'Natural Exercise' (Benda, 2004).

**Florence Nightingale** (1860, p.56) advocated the use of pets for people suffering from chronic illness and in her Notes on Nursing stated: "*a small pet is often an excellent companion for the sick, for long chronic cases, especially.*"

However, it was not until the 1960s and with the recognition of the work of such people as child psychologist Levinson (1969), that the idea of the human-animal bond provided the scientific basis for the study of human-animal interactions. It was later still before the medical profession began to undertake serious research into the therapeutic possibilities of companion animal interaction (Benda, 2004).

## The physiology of human-animal interactions

In attempting to identify a physiological mechanism underlying the benefits derived from companion animal interaction, research has focused on measuring basic physiological parameters such as heart rate and blood pressure fluctuations. Wolff and Frishman (2005) date the first scientific study of this type to the early 20th century when it was shown that the blood pressure of a dog fell while being stroked and it is believed that tactile contact is thought to mediate this effect (Lynch, 1977). Further research studies identified a mutual effect for people suggested to be based on a shared need for attention in both species (*attentionis egens*) (Odendaal, 2000). This stimulated further investigations – the most oft-cited studies being those of Friedmann and colleagues (1980; 1995; 2003). Odendaal's paper (2000) highlighted changes at the molecular level by identifying specific neurochemical changes that occurred in association with a drop in blood pressure in both dogs and people following positive interaction. Odendaal (2000) argued that this provided the sound theoretical basis necessary to gain support for animal-assisted therapy from the medical profession.

However, Parslow and Jorm (2003) were unusual in finding a **negative effect** of pet ownership on cardiovascular risk factors. In their study of over



2000 Australian subjects, they found that although pet owners took slightly more mild physical activity, they also had significantly higher diastolic blood pressures, were more likely to smoke and had higher Body Mass Indices (BMI) than non-pet owners.

## General benefits of interacting with companion animals

Most people interested in the field are now aware of the extensive range of potential benefits to human physical, psychosocial and mental health to be gained from interacting with companion animals. This has been the subject of many research studies since the 1960s. Brodie and Biley (1999) provide an excellent and comprehensive review of key studies to date.

## The environment and health

Increasing recognition of the interdependence of people and the environment is reflected in the emergence of research papers in medical journals related to the

promotion of healthy lifestyles. The term 'biophilia', coined by American zoologist **Edward Wilson**, refers to the innate need that human beings have to make contact with other living beings. This hypothesis underpins much of the current thinking in relation to the effects of contact with other living things on our health and well-being (Ball *et al.* 2001; Frumkin 2001; Burls and Caan, 2005; Suminski *et al.* 2005; Cutt *et al.* 2007). Burls and Caan (2005) highlight several small-scale conservation projects in the UK which have an impact on physical and mental health and Ball *et al.*'s (2001) and Suminski *et al.*'s (2005) studies attempted to identify specific features of the physical and social

environment which encouraged participation in physical activity in general and physical activity involving a pet, for example, dog walking. Cutt *et al.* (2007) reviewed the literature examining the links between pet ownership and physical activity levels and concluded that there are a number of complex social, physical and even policy-related factors influencing dog walking.

## Social support and community health

Cutt *et al.*'s (2007) study is interesting in that it links the idea of social support with the specific activity

of dog walking and cites evidence that people with low levels of social support from family and friends are twice as likely to be sedentary than people who enjoy a high level of social support. This agrees with Ball *et al.* (2001) who reported that women who had no companion (either another person, or a dog) to walk with, were three times less likely to walk for recreational or exercise reasons.

There is no doubt that dog-owners do come into contact with others while out walking their dogs and do benefit from the increased socialisation with others in their local community (Wood *et al.* 2005; Cutt *et al.* 2007). High levels of social support seem to have a buffering effect on health and studies support the role of companion animals on several aspects of health and well-being, particularly where social support from family, friends and spouses is lacking (Banks and Banks, 1992; McNicholas *et al.* 2001)

Wood *et al.* (2005) explored the relationship between pet-ownership and social capital (features of social existence, such as social networks, trust and social norms) to health. They examined the link between pet ownership and the following elements of social capital: social facilitation, exchange of favours, motivators for use of community open spaces, participation in community activities and as a protective factor for mental health. The qualitative study found a link between feelings of reduced loneliness and pet-ownership and increased social facilitation, but no statistically significant relationship between any other factors, when adjusting results for age, sex, education and whether participants had children or not.

## Detection of illness and disease

A relatively new application of the therapeutic use of animals has been in the detection of illness and disease. The therapeutic use of dogs for sufferers of epilepsy was first documented in



the 1800s. However, specially trained **Seizure Alert**<sup>®</sup> dogs are a 21st Century phenomenon (McCulloch, 1982). **Seizure Alert**<sup>®</sup> dogs, which are either an individual's own pet or an animal selected from a rescue centre, are trained to alert their owners to an impending epileptic seizure. Trained dogs are reliable indicators of seizure activity up to 45 minutes prior to a seizure taking place and each dog has its own individual and consistent time of alert (Strong and Brown, 2000). However, although **Seizure Alert**<sup>®</sup> dogs undoubtedly enhance the lives of their owners, Strong and Brown (2000) suggest that untrained pet dogs of epilepsy sufferers may suffer from reduced welfare and present risks to their owners since they can react instinctively with fear or aggression to seizure activity.

People with diabetes can experience hypoglycaemic episodes, which are distressing and can also have serious neurological and cardiovascular consequences (Chen *et al.* 2000). Lim *et al.* (1992) suggest that in excess of 30% of pet dogs living with diabetic people exhibit behavioural changes during hypoglycaemic episodes and dogs have therefore been successfully trained to recognise and alert owners to these hypoglycaemic episodes in a similar manner to the **Seizure Alert**<sup>®</sup> dogs.

## Cancer detection

The work of **Hearing Dogs for Deaf People** and researchers at the Dermatology Department, **Amersham Hospital** Buckinghamshire to illustrate the ability of a dog to detect human bladder cancer was published in the *British Medical Journal* in 2004 (Willis *et al.* 2004). Williams and Pembroke (1989) are credited with being the first to suggest that dogs could detect malignant tumours on the basis of odour and their letter to *The Lancet* described the case of a woman whose pet dog showed an obsessive interest in a leg lesion, which turned

out to be malignant. There have been several anecdotal reports since the original letter to *The Lancet*. In Willis *et al.*'s study (2004) six dogs were trained to distinguish patients with bladder cancer on the basis of urine odour. The dogs' success rate was 41%, which exceeded by 27% the rate expected by chance alone and hence the researchers stated this to be a 'proof of principle study' only. In response to the original study to the *British Medical Journal*, Leahy (2004) criticised the study on the basis that it did not differentiate cause from association and suggested that the dogs may have detected urine substances associated with increased cancer risk, eg smoking. Either way, this area remains ripe for investigation.

Laumbacher *et al.* (2006) provide an interesting twist on the positive use of dogs in cancer detection. In their paper, they cite evidence that suggests that risk factors from dogs, such as microbial viral agents, may contribute to the carcinogenesis of human breast cancer. In their study, they found that twice the number of cancer patients were pet-owners than individuals in the control group. The cancer patients also kept dogs more frequently than any other pet. It was postulated that the dog may act as an intermediate vector transmitting a virus between wild mice and humans. However, this study was based in Bavaria, where dogs are rarely kept indoors and so its findings may not easily be extrapolated to other countries where, although dogs live in close association with humans, they are largely maintained indoors in a domestic environment. However, the study is interesting and deserving of further investigation.

## Risks

There are an increasing number of research studies that attempt to evaluate the potential risks from interacting with companion animals but, in comparison to the studies documenting the benefits, these are

scarce. Again, Brodie *et al.* (2002) provide an excellent review of the studies to date, including the major disease-causing organisms and their source in different species. Khan and Farrag's (2000) paper still remains one of the few produced by UK researchers and many of the other papers either concentrate on a specific human-animal interaction, or a particular type of risk (Wan and Weng, 2004; Krause *et al.* 2005; Benson *et al.* 2006; Hemsworth and Pizer, 2006).

## Conclusions

Research studies to date have concentrated on the benefits from pet ownership or companion animal contact to physical, mental and psychological health. New applications of the therapeutic use of animals are emerging, for example, in disease detection and have probably not been explored to their fullest capacity. In addition, potential risks to humans and animal welfare concerns should not be overlooked and remain important areas of further research.

## References

- Ball, K., Bauman, A., Leslie, E. and Owen, N. 2001. Perceived environmental aesthetics and convenience and company are associated with walking for exercise among Australian adults. *Preventive Medicine* 33: 343-440.
- Banks, M.R. and Banks, W.A. 1992. The effects of animal-assisted therapy on loneliness in an elderly population in long-term care facilities. *Journal of Gerontology* 57A (7): M428-M432.
- Benda, W. 2004. For man would die of a great loneliness. *Seminars in Integrative Medicine* 2(4): 127-128.
- Benson, L. S., Edwards, S. L., Schiff, A.P., Williams, C. S. and Visotsky, J. 2006. Dog and cat bites to the hand: treatment and cost assessment. *Journal of Hand Surgery* 31A: 468-473.
- Brodie, S. J. and Biley, F. C. 1999. An exploration of the potential benefits

- of pet-facilitated therapy. *Journal of Clinical Nursing* 8: 329-337.
- Brodie, S. J., Biley, F. C. and Shewring, M. 2002. An exploration of the potential risks associated with using pet therapy in healthcare settings. *Journal of Clinical Nursing* 11: 444-456.
- Burls, A. and Caan, W. 2005. Human health and nature conservation. *British Medical Journal* 331: 1221-1222.
- Catanzaro, T. E. 2003. Human-animal bond and primary prevention. *American Behavioural Scientist* 47 (1): 29-30.
- Chen, M., Daly, M., Williams, N., Williams, S., Williams, C. and Williams, G. 2000. Non-invasive detection of hypoglycaemia using a novel, fully biocompatible and patient friendly alarm system. *British Medical Journal* 321: 1565-1566.
- Cutt, H., Giles-Corti, B., Knuiiman, M. and Burke, V. 2007. Dog ownership, health and physical activity: a critical review of the literature. *Health and Place* 13: 261-272.
- Friedmann, E., Katcher, A. H., Lynch, J. L. and Thomas, S. 1980. Animal companions and one-year survival of patients after discharge from a coronary care unit. *Public Health Reports* 95 (4): 307-312.
- Friedmann, E. and Thomas, S. 1995. Pet ownership, social support and one-year survival after acute myocardial infarction in the cardiac arrhythmia suppression trial (CAST). *American Journal of Cardiology* 76: 1213-1217.
- Friedmann, E., Thomas, S.A., Stein, P.K. and Kleiger, R.E. 2003. Relation between pet ownership and heart rate variability in patients with healed myocardial infarcts. *The American Journal of Cardiology* 91: 718-721.
- Frumkin, H. 2001. Beyond toxicity: Human health and the natural environment. *American Journal of Preventive Medicine* 20 (3): 234-240.
- Hemsworth, S. and Pizer, B. 2006. Pet ownership in immunocompromised children – a review of the literature and survey of existing guidelines. *European Journal of Oncology Nursing* 10: 117-127.
- Johnson, R. A., Meadows, R. L., Haubner, J. S. and Sevedge, K. 2003. Human-animal interaction: A Complementary/Alternative Medical (CAM) Intervention for cancer patients. *American Behavioural Scientist* 47 (1): 55-69.
- Khan, M. A. and Farrag, N. 2000. Animal-assisted activity and infection control implications in a healthcare setting. *Journal of Hospital Infection* 46: 4-11.
- Krause, G., Zimmermann, S. and Beutin, L. 2005. Investigation of domestic animals and pets as a reservoir for intimin-(eae) gene positive *Escherichia coli* types. *Veterinary Microbiology* 106: 87-95.
- Laumbacher, B., Fellerhoff, B., Herzberger, B. and Wank, R. 2006. Do dogs harbour risk factors for human breast cancer? *Medical Hypotheses* 67: 21-26.
- Leahy, M. 2004. Olfactory detection of human bladder cancer by dogs: cause or association? *British Medical Journal* 329: 1286-1289.
- Levinson, B. 1969. *Pet-orientated child psychotherapy*. Charles C Thomas. Springfield.
- Lim, K. Wilcox, A. Fisher M. and Burns-Cox, C. I. (1992) Type 1 diabetics and their pets. *Diabetic Medicine* 9 (suppl. 2): S3-S4.
- Lynch, J. J. 1977. *The broken heart: The medical consequences of loneliness*. New York. Basic Books.
- McCulloch, A. J. 1982. Animal facilitated therapy: overview and future direction. *California Veterinarian* 36: 13-24.
- McNicholas, J., Collis, G. M., Kent, C. and Rogers, M. 2001. *The Role of Pets in the Support Networks of People Recovering from Breast Cancer*. Presented at the 9th International Conference on Human-Animal Interactions, People and Animals, A Global Perspective for the 21st Century, Rio de Janeiro, Brazil, September 13-15, 2001.
- Nightingale, F. 1860. *Notes on Nursing: What it is and what it is not*. New York. D Appleton and Company.
- Odendaal, J. S. J. 2000. Animal-assisted therapy: magic or medicine? *Journal of Psychosomatic Research* 49: 275-280.
- Parslow, R.A. and Jorm, A.F. 2003. Pet ownership and risk factors for cardiovascular disease: another look. *Medical Journal of Australia* 179: 466-468.
- Strong, V. and Brown, S.W. 2000. Should people with epilepsy have untrained dogs as pets? *Seizure* 9: 427-430.
- Suminski, R.R., Poston, W.S.C., Petosa, R. L., Stevens, E. and Katzenmoyer, L. M. 2005. Features of the neighbourhood environment and walking by US adults. *American Journal of Preventive Medicine* 28 (2): 149-155.
- Wan, K. S. and Weng, W. C. 2004. Eosinophilic meningitis in a child raising snails as pets. *Acta Tropica* 90: 51-53.
- Williams, H. and Pembroke, A. 1989. Sniffer dogs in the melanoma clinic? *Lancet* 1: 734.
- Willis, C.M., Church, S.M., Guest, C.M., Cook, A.W., McCarthy, N., Bransbury, A.J., Church, M.R.T. and Church, J.C.T. 2004. Olfactory detection of human bladder cancer by dogs: proof of principle study. *British Medical Journal* 329: 1-6.
- Wolff, A.I. and Frishman, W.H. 2005. Animal-Assisted therapy in cardiovascular disease. *Seminars in Integrative Medicine* 2: 131-134.
- Wood, L., Giles-Corti, B. and Bulsara, M. 2005. The pet connection: Pets as a conduit for social capital? *Social Science and Medicine* 61: 1159-1173.