



## Animal-assisted therapy at Mayo Clinic: The time is now



Edward T. Creagan<sup>a, \*</sup>, Brent A. Bauer<sup>b, c</sup>, Barbara S. Thomley<sup>c</sup>, Jessica M. Borg<sup>c</sup>

<sup>a</sup> Division of Medical Oncology, Mayo Clinic, Rochester, MN, USA

<sup>b</sup> Division of General Internal Medicine, Mayo Clinic, Rochester, MN, USA

<sup>c</sup> Complementary Integrative Medicine Program, Mayo Clinic, Rochester, MN, USA

### A B S T R A C T

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The animal–human bond refers to an emotional, almost existential, relationship between animals and people. From the time of antiquity, domestic animals were an important source of economic vitality, but with the changing cultural landscape, the companion animal has become a faithful friend. Overwhelming anecdotal evidence supports the healing power of this relationship. We summarize the emerging literature on the neurobiochemical and cardiovascular benefits of companion pet ownership. We address the peer-reviewed data from myriad journal articles assessing the impact of the companion animal on the quality and often the length of life of select patients.

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On a bitterly cold February morning in 1994, one of the authors (E.T.C.) received a telephone call from the emergency department that dramatically changed his perspective on the value of pets in the clinical scenario. The patient was a 56-year-old man with alcoholism and other life difficulties. He had been a tenured professor at a major university but lost his position because of alcoholism. A friend brought the patient to the emergency department because of shortness of breath, clinical deterioration, fever, and confusion. Clinical assessments documented pneumonia and hepatic and renal failure in the setting of metastatic non–small cell lung cancer. With aggressive supportive care and management, the patient's condition stabilized and his sensorium cleared.

The patient then shared the need to get home to be with “Max.” At that point, we naïvely thought that Max was a spouse, a partner, or a family member, but Max turned out to be a 95-pound German Shepherd. This 4-legged furry creature was the catalyst that provided the stimulus and energy to help the patient mobilize resources to return home; indeed, he ultimately was able to do so.

This experience underscores the tremendous power of pets to augment traditional medical interventions for patient wellness. The sociology and biology of pets and the medical condition has been studied, and in this article, we summarize the peer-reviewed research [1–12] in this critical area.

*Abbreviation:* FEMA, Federal Emergency Management Agency.

\* Corresponding author. Division of Medical Oncology, Mayo Clinic, 200 First St SW, Rochester, MN, 55905, USA.

E-mail address: [creagan.edward@mayo.edu](mailto:creagan.edward@mayo.edu) (E.T. Creagan).

### 1. The economics of pet ownership

Consider the power of pets from an economic perspective. Ongoing analysis shows that pets are a powerful economic vector at the community level. The pet-related economic sector is the only economic engine that has never shown a major downturn, despite the vicissitudes of the marketplace. The Global Pet Expo held in March 2014 [13] documented that pet spending is higher than ever, with an estimated \$58.5 billion being spent in 2014. Despite the recent economic downturn, the pet industry continues to be relatively “bulletproof” in terms of food, supplies, care, and other purchases, emphasizing the high value that people place on their pets.

Demographic studies indicate that more households have pets than have children. Nearly 75% of all American households have pets, with almost as many pets as there are US citizens, especially if fish are counted. Each household annually spends an average of \$500 on pets, which accounts for about 1% of total spending per year for an average-income household. As of several years ago, households with pets spent more money on pet-related purchases than on alcohol, landline phone connections, and men and boys clothing combined. Even when restaurants showed a decrease in consumer spending, expenditures for pet food stayed constant. In most households, expenses for pet food alone exceeded that of candy, bread, chicken, cereal, or even ready-to-eat meals. For many pet owners, veterinary and related expenses are viewed as “mission critical” and not frivolous or discretionary. These data demonstrate the tremendous importance of pets in American families.

## 2. Role of pets as valued family members

Hurricane Katrina was a devastating event for people and their pets along the Gulf Coast. Amidst the havoc of those days and weeks, it became clear that many pet owners were willing to risk their lives rather than abandon their pets to certain death. Wayne Pacelle, the President and Chief Executive Officer of the Humane Society of the United States, indicated that this event was transformative in that disaster plans would now include an acknowledgment of pet safety [14]. The Federal Emergency Management Agency (FEMA) website has guidelines for locating missing pets and how to care for them during disasters [15], as well as portable veterinary services to address the needs of animal owners during a crisis [16]. The recent Japanese tsunami likewise had a devastating impact on people and their pets. Countless stories have shown area residents refusing to leave their pets and risking their lives during the tsunami and subsequent nuclear contamination.

Organizations devoted to international pet rescue and adoption also are a testament to the cultural value placed on pets. Many readers likely can recall photographs of servicemen bringing home abandoned pets from a warzone or photographs of America's Olympic team rescuing homeless pets from the streets of Russia.

A Mayo Clinic study by Larson et al. [17] involved 309 patients with advanced cancer receiving outpatient chemotherapy. Approximately 60% were receiving palliative treatment, and approximately half of the patients had a pet. Most described their pets as being of tremendous value during their cancer, although some patients did have pet-related issues. An important dimension of holistic cancer care for patients is to inquire about their pets and how their pets are being cared for during the patient's chemotherapy sessions. In this study, patients with pets had less stress overall, and only 6% had any concerns about infection. Because the family unit is important in cancer management, caregivers cannot ignore the importance of creatures with fur, fins, or feathers and their role as a member of the cancer patient's family.

The strength of the animal–human bond is especially evident when a person is faced with the painful decision of whether to euthanize a beloved dog or cat. The authors have been through this nightmare on several occasions, and we have no words to document the powerful sense of loss and anguish surrounding the decision-making process.

## 3. Effect of pets on quality of life and well-being for older individuals

One of the greatest changes in American culture is the lockstep cadence of baby boomers into their postretirement years: 10,000 individuals retire daily, and an equal number turn 65 years old. What is the effect of pets on the health of older adults? Numerous studies [18,19] of elderly patients with pets have documented decreased blood pressure, decreased use of antidepressants, and decreased use of medical services. These individuals have better cardiovascular fitness and a better quality of life and sense of well-being than those without pets.

With the aging American population comes seismic pressure on the health care delivery system, eg, to treat and see more patients while reducing costs. Increasing interest and documentation of the value of animal-assisted therapy can no longer be ignored. A review of pets and aging documented by PAWSitive interaction [20] documents the value of pets in the lives of elderly patients. Banks and Banks [21] showed that loneliness was reduced through animal-assisted interaction, and loneliness and social isolation doubtlessly factor in mortality. The perception of loneliness being decreased by pet therapy was recently confirmed by Vrđanac et al. [22].

The prevalence of dementia is now reaching pandemic numbers, with a diagnosis of Alzheimer disease occurring approximately every 71 s [23]. Majic et al. [24] performed a matched case-control trial and showed that animal-assisted therapy was a promising treatment option for agitation or aggression and depression in patients with dementia. Moreover, this approach might delay progress of neuropsychiatric symptoms.

With the increasing scrutiny of randomized clinical trials, a definitive systematic review of nutrition in older adults with dementia [25] has provided striking insights that corroborate with the experience of one of the authors (E.T.C.) regarding consequences of protein caloric malnutrition in patients with dementia. Namely, malnutrition is compounded by overarching anatomic and cognitive concerns and the social burden of isolation. A fascinating study of residents of a nursing home identified those who were losing weight because of nutritional compromise [26]. Individuals were randomized to eat their meals in the presence of a portable aquarium or by themselves. Those who ate alongside the aquarium had an increase in mean body mass and caloric intake compared with individuals who ate by themselves, and it resulted in an improved overall sense of well-being. Because nutrition compromise can have a marked impact in elderly individuals, this study suggests the value of animal companionship at mealtimes for enhancing patient nutrition. This outcome has been parlayed into other environments so that an aviary is now a common addition to nursing homes.

Stroking a dog, grooming a cat, or otherwise being engaged with an animal enhances “happy hormones” such as oxytocin, serotonin, phenylethylamine, dopamine, endorphins, prolactin, and related neuropeptides that creates a sense of wellness and serenity. Likewise, the stress hormone cortisol is decreased. Numerous case reports have described individuals in a catatonic nonresponsive state (eg, from strokes and related conditions) who somehow connected with a dog or cat to the extent that smiles and gestures were evident. Dramatic examples include severely withdrawn pediatric patients who started communicating with adults after touching and playing with pets.

Compelling studies have clearly documented the benefits of interacting with pets. A randomized trial was conducted among stockbrokers with hypertension [27]. All received traditional hypertensive medications, but participants also were randomized to groups with or without a pet. Unsurprisingly, the group with the pets had a higher rate of recovery and less need for medication compared with individuals only using medicine.

Friedmann et al. [28] surveyed 92 patients with myocardial infarction; of the 84% who survived 1 year, almost 60% had 1 or more pets. The positive effects of domestic dogs on human health [29] and the benefits of animal companionship [30] are well documented. Inmates in Lima, Ohio, seemed calmer and more restrained as a result of contact with small pets [31]. Interactions with animals clearly affect an individual's behavior.

## 4. Healing potential of the animal–human connection

Studies of pet therapy, animal-assisted therapy, and the intensive care unit have assessed the phenomenon of the animal–human bond, including aspects of the physiology, psychology, and sociology of these relationships. Animal-assisted therapy was documented to improve hemodynamics in patients with heart failure and decrease postoperative pain in pediatric patients. Psychologic effects were equally affirming. Cardiac patients who named and fed fish had a higher frequency of behavioral and cardiovascular control, and animal-assisted therapy was associated with relaxation and calmness in participants.

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