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Zoeyia: An essential component of “One Health”

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Abstract – One Health is dedicated to improving the health of all species through the integration of human and veterinary medicine. To date, initiatives have primarily focussed on controlling zoonoses. This paper discusses zoeyia, the positive benefits to human health from interacting with animals, focussing on the companion animal.

Résumé – «Zoeyia» : Un élément essentiel de «Une santé». Le concept de «Une santé» se voue à l'amélioration de la santé de toutes les espèces par l'intégration de la médecine humaine et vétérinaire. Jusqu'à maintenant, les initiatives se sont principalement concentrées sur le contrôle des zoonoses. Cet article discute de la notion de «zoeyia», soit les bienfaits positifs pour la santé humaine de l'interaction avec les animaux, en se penchant particulièrement sur l'animal de compagnie.

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The worldwide One Health initiative is dedicated to improving the health of all species — human and animal — through the integration of human health care and veterinary medicine. Diverse collaborations of veterinary and human health care professionals working at multiple levels of international, federal, and provincial governments can improve human, environmental, and animal health. Although important work is being done at the governmental level, most veterinarians and physicians work in primary care in the community.

Zoonotic diseases affect both humans and animals and can spread from animals to humans and from humans to animals. Sixty-one percent of the infectious diseases affecting humans are zoonotic; 75% of new or emerging diseases around the world are zoonotic (1). The increasing number and significance of zoonotic diseases emerging worldwide are due to multiple converging factors: climate change, increasing urbanization, human encroachment in wild areas, increased global travel and, for companion animals, increasing intimacy with humans (2). Zoonotic injury, including dog bites, cat scratches, and traumatic injury from other species, is considered a form of non-infectious zoonotic concern. To improve the lives of all species, family physicians, veterinarians, and their staff can work together to control the risk of zoonotic disease and injury.

The World Health Organization defines health as “a state of complete physical, mental and social well being and not

merely the absence of disease or infirmity” (3). One Health is not limited to the prevention of zoonoses; it also encompasses the human health benefits from animals. Benefits to humans include animals used in the production of food for human consumption, animals as models for research of human diseases, and pet-assisted therapy. The focus of this paper is the benefit of companion animals to their families. To discuss this positive impact on human health, we have coined the term “zoeyia” from the Greek root words for animal (zoion) and health (Hygeia was the ancient Greek goddess of health, the same source as “hygiene”). Zoeyia is the positive inverse of zoonosis (from the same “zoion” and “nosos,” or disease).

Chronic diseases place the greatest burden on the health care system, society, patients, and their families. The most costly are cancer, musculoskeletal conditions, cardiovascular disease, diabetes, obesity, neuro-psychiatric disease, and respiratory disease (4). Many risk factors of these diseases are beyond the patient's direct control.

Controllable risk factors include decreased/limited physical activity, obesity, tobacco/alcohol use, hypertension, challenges to activities of daily living and the social isolation of chronic disease. All these risk factors are positively influenced by human contact with companion animals. A sampling of the zoeyia medical literature includes studies and trials on the positive impact of pets on physical activity, smoking cessation, control of hypertension, and strengthening the community.

Physical inactivity is such a significant predictor of disease that reducing this risk factor by a mere 10% would lead to estimated savings of \$2.1 billion, or 2.5% of the total direct health care costs in Canada (5). Walking is an accessible exercise for most humans, including the obese. Exercise advocates frequently recommend a “buddy system” for physical activity programs. Where a human buddy can both encourage and discourage regular exercise, a dog is a consistently positive influence — initiating exercise, adding enjoyment, and a source of parental

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pride (6). Dogs provide a social support system for exercise. Dog ownership, where the owner accepts responsibility to care for the pet, is a significant indicator of increased physical activity (7). Increased physical activity helps with weight loss (for both humans and pets), improves joint health, and reduces the risk for myocardial infarction by 35% to 55% (8).

Child obesity is of increasing concern. The Child Heart and Health Study in England revealed that 9- to 10-year-old children with dogs were significantly more active than those without. “Associations between dog ownership and physical activity did not differ significantly between weekdays and weekends, summer and winter, boys and girls, or ethnic groups” (9).

Physical activity supports mental acuity, and this effect persists over the years. Humans who had walked over 72 blocks per week had a greater volume of grey matter 9 years later (10). This effect remains significant after adjusting for age, total intracranial volume, gender, white matter grade, magnetic resonance imaging (MRI) infarcts, time taken to walk 15 ft, body mass index, race, and education. “Greater grey matter in the inferior frontal gyrus, the hippocampus, and the supplementary motor area was associated with a reduced risk of developing cognitive impairment (mild cognitive impairment or dementia)” (10).

Exposure to tobacco smoke, primary or second-hand, is a widely recognized risk factor for many diseases, including cancer, and cardiovascular and respiratory diseases (11). In a recent smoking cessation study, concerns about second-hand smoke affecting pets was found to be a strong motivator to stop smoking, to stop smoking in the home, and to encourage other household members to quit smoking (12). This research provides a broad new base of support for health care professionals to amplify smoking cessation messages, of particular significance for smokers who live alone with a pet. This is especially important for smokers who do not visit their human health care provider regularly. These individuals may see veterinarians significantly more frequently than their own physician. Veterinarians, therefore, could be an important influence on smoking cessation.

An estimated 5 million Canadians have high blood pressure (8). A recent study of hypertensive patients receiving angiotensin-converting enzyme (ACE) inhibitor therapy looked at changes in blood pressure in stressful situations. Participants were not pet owners at the outset of the study. One group acquired pets at the onset of drug therapy; the control group started drug therapy but did not acquire a pet. After 6 months of treatment, the participants were stressed with standard math and language problems commonly used in cardiac research. The mere presence of a pet had a significant and positive effect on the cardiovascular parameters of stress in their owners. Pets provide the non-judgemental social support intervention that buffers pathogenic responses to stress — even to relatively new pet owners (13).

Cat ownership, in particular, significantly reduces the risk of cardiovascular disease and associated death (14). This holds true, regardless of age, gender, ethnicity, systolic blood pressure, cigarette smoking, diabetes mellitus, serum cholesterol, and body mass index. “Acquisition of cats as domestic pets may represent a novel strategy for reducing the risk of cardiovascular disease in high-risk individuals” (14).

A sense of belonging is an indicator of health (11). The pervasive view of pets as integral members of the family has been buttressed by a recent study where oxytocin (the “attachment hormone”) levels in pet owners increased significantly when their dogs gazed at them. “This study has revealed a clue to the neural mechanisms by which association with dogs affect the physical and mental health of humans” (15).

Stressful events tend to escalate in the lives of the elderly, as their social supports and physical capabilities diminish. Friends and partners die, health deteriorates, and depression is not uncommon. The accumulation of stressful events is associated with increased doctor contacts for patients without pets — not for those who have animal companions (16). Pets provide companionship, a sense of security, and a feeling of being loved. “Pet ownership reduces demand for care in times of stress” (16), alleviating costs to the health care system.

Zoeyia extends beyond the benefits to the individual pet owner; companion animals also strengthen communities. Pets facilitate social interactions; they promote a sense of safety. Companion animals encourage reciprocity — the give and take among neighbours that builds a sense of community. Pet owners were 57% more likely to be civically engaged than non-pet owners. “Pets emerged as an inferred antidote to loneliness — not just as direct companions but by virtue of the social contact and interactions they precipitate with neighbours” (17). The benefits of companion animals have a halo effect, spreading through the community. “Pets (specifically, dogs) were spontaneously referred to in discussions about getting to know humans locally, by both pet and non-pet owners, and across the life-stage continuum” (17).

The significance of pets to human health has long been acknowledged by the US National Institutes of Health. Their consensus statement on the Health Benefits of Pets concluded with a call that “future studies in human health should consider the presence or absence of a pet in the home and the nature of this relationship with the pet as a significant variable” (18). One Health encompasses both preventing zoonotic disease and injury, and empowering zoeyia. Without exception, authors exploring zoeyia commented that the positive influence of pets may be attributed in large part to the attachment humans had to their animal companions.

Zoeyia is the evidence base for the philosophical construct of the human-animal bond. Further research is critical to ensure that One Health initiatives consider and quantify the positive impact of animals on human health. Cost containment is a primary concern of policy makers. The bottom line of economic impact of zoeyia has not been analyzed. When it is studied, the results are powerful (16). Currently, health care savings of pet ownership have only been inferred. Evaluating zoeyia in economic terms permits its assessment on equal footing with any other policy initiative; it permits an instantly understandable cost/benefit analysis of the close relationship we have with our animal companions.

The US National Institutes of Health, Centers for Disease Control and Environmental Protection Agency are leading the National Children’s Study. This prospective research will look at how various factors influence the health of 100 000 children

over a 21-year period. It presents an opportunity to further study and measure the connections between pets and child health and development (19).

Representatives on One Health panels and committees must insist on a balanced consideration of the impact of animals on human health, by introducing the concept and evidence of zoonoses when discussions are focussed on zoonoses.

Educators can include this concept when teaching medical professionals (human and veterinary) about the human-animal interface. The benefits of companion animals are generally understood on an emotional level, but not well articulated or measured. As a result, zoonoses tends to fall out of consideration when a medical doctor is consulted by a patient. It may well be that getting a dog will be a huge benefit to an overweight individual who cannot find the motivation to exercise. Perhaps a cat can help the patient at risk of stroke. Maybe a pet of any species will help the socially isolated. Such recommendations must consider other factors, including the patient's ability to look after the animal, and criteria for selecting the right pet. In this, and in many other areas, collaboration between the medical and veterinary professions will enhance the health of the patient, enrich the community and promote the integration of pets into our society as a whole.

Veterinarians are in a unique position to influence One Health — especially at the community level. Ninety-five percent of veterinarians identify the human-animal bond as an important feature of their philosophy of practice; 91% indicate they evaluate the strength of this bond between client and pet when treating an animal (20). Conversely, less than half offer clients resources on the subject, train staff to evaluate clients' bond with their pets, or even communicate to their own staff about the human-animal bond. Strengthening the bond clients have with their pets, which can be strongly influenced by the veterinarian, is a first step in enhancing zoonoses.

Veterinary medicine includes the practice of One Health, both the prevention of zoonoses and the promotion of zoonoses.

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