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SPONTANEOUSLY ARISING DISEASE: REVIEW ARTICLE

One Health Solutions to Obesity in People and Their Pets

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Summary

Despite the high prevalence of overweight and obesity in the human and companion animal populations, and the global trends for increasing numbers of affected people and pets, there are few successful interventions that are proven to combat this complex multifactorial problem.

One key strategy involves effective communication between human and veterinary healthcare professionals with patients and clients about obesity. In human healthcare, the focus of communication should be on physical activity as part of overall health and wellbeing, rather than assessment of the body mass index; clinical examination of patients should record levels of physical activity as a key ‘vital sign’ as part of their assessment. Successful weight loss programmes for companion animals also involves strategic communication with the entire healthcare team leading clients through the ‘stages of change’.

There is great potential in employing a ‘One Health’ framework to provide novel solutions for the prevention and treatment of this condition in people and their pets. Comparative clinical research into the biology of obesity and its comorbidities in dogs and cats is likely to lead to knowledge relevant to the equivalent human conditions. The advantages of companion animal clinical research over traditional rodent models include the outbred genetic background and relatively long lifespan of pets and the fact that they share the human domestic environment. The human–companion animal bond can be leveraged to create successful programmes that promote physical activity in people and their pets with obesity. Dog walking is a proven motivator for human physical activity, with health benefits to both the owner and the dog. Realizing the potential of a One Health approach will require the efforts and leadership of a committed group of like-minded individuals representing a range of scientific and medical disciplines. Interested parties will need the means and opportunities to communicate and to collaborate, including having the resources and funding for research. One Health proponents must have a role in forming public policy related to the prevention and management of overweight and obesity.

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How Should Healthcare Professionals Best Communicate About Human or Pet Obesity?

Communication About Human Obesity

It is hard to pick up a newspaper or watch television without hearing yet another story on the global problem of obesity. It is estimated that one-third of all Americans are obese (Ogden *et al.*, 2014) and in 2013 the American Medical Association voted to classify obesity as a disease. In light of this, it is interesting to note that the only treatment options currently covered by insurance plans are diet pills and bariatric surgery. Of course these are by far the most expensive treatment options available and both have shown serious side effects and limited effectiveness, particularly in the long term. In addition, Americans have become obsessed with dieting and over 64% of adults express a desire to lose weight (73.2% of women and 55.1% of men) (Yaemsiri *et al.*, 2011). Yet despite this desire to lose weight and billions of dollars being spent on diet books, the statistics continue to show no improvement in the rising tide of obesity.

Physicians today are expected to talk to their patients about weight and in fact are required to document on a patient’s record if their body mass index (BMI) falls into the obese range. This often causes considerable unease in both the physician and the patient. Certainly most patients who are overweight already know it and it is doubtful that labelling them as such is helpful in getting them to lose weight and keep it off. Despite mandates to label patients as being obese, there is evidence to suggest that physicians are becoming less likely to discuss the issue of weight with their patients. Data from National Ambulatory Medical Care Survey for 1995–1996 and 2007–2008 showed that during this period adults who were overweight or obese increased from 52.1% in 1995 to 63.3% in 2008. However, patients seen in 2007–2008 had 46% lower odds of receiving weight

counselling than in 1995–1996. Even more concerning was the fact that patients with hypertension were 46% less likely and diabetics 59% less likely, to receive such counselling (Kraschnewski *et al.*, 2013). This would suggest that current mandates for assessing obesity are not having a positive effect.

Adding to this is evidence that after controlling for a person’s physical activity and fitness level, increasing level of obesity has very little effect on mortality rates (Barlow *et al.*, 1995). Numerous studies suggest that you are better off being fit and fat than skinny and unfit. To put it another way, a low level of fitness seems to be a bigger risk factor for mortality than mild to moderate levels of obesity. The important point to be made is that the benefits of physical activity are the same, regardless of whether you lose weight. This is an important point for patients to grasp, because too often they assume that if they do not lose weight with their exercise routine, then it is not helping. However, the evidence proves this is not true.

For these reasons, it is necessary to develop a new and fresh approach to discussing the issue of weight in the examination room. Instead of the obsession with measuring BMI, labelling patients as obese and prescribing a pill, bariatric surgery or the latest fad diet, the focus should be on total health. It should be acceptable to give patients permission to be fat and still be healthy and a means of achieving this would be to shift the focus from BMI to physical activity. Discussing a patient’s level of physical activity is much less threatening than discussing their BMI and labelling them as sedentary and has much less stigma than labelling them as obese. ‘Health at every size’ is a philosophy that suggests that the primary focus should be on a patient’s broader health rather than just their BMI. This does not mean giving patients permission to eat whatever they want and to continue gaining weight. Rather it means talking to a patient about

more than simply losing weight, since we know that even if they are successful with a new diet, 95% will regain lost weight in 3–5 years (Council on Size and Weight Discrimination, 2011).

In the examination room, patients should be encouraged to simply try to maintain their weight, by eating as healthily as possible. While health professionals may not readily achieve consensus on what constitutes a healthy diet, one simple recommendation is ‘eat food, not too much, mostly plants’ (Pollan, 2008). This should be a central message to patients about their diet, in addition to the concept of energy balance and the fact that weight loss will occur only when the calories eaten are exceeded by the calories burned. While this concept has often been maligned, it is important for patients to understand that they can eat more in 5 min than they can burn off by exercise alone during the rest of the day. Therefore, significant weight loss is unlikely to occur without moderating the number of calories eaten. However, that does not discount the importance of exercise to weight management and more importantly its great importance to their general health.

Rather than a singular focus on a patient’s BMI and expensive weight loss treatments, there should be more emphasis on assessing the patient’s activity level and trying to improve that. There is a greater chance of success with changing a patient’s physical activity habits than in getting them to lose weight and keep it off. Getting patients more physically active will do more for their health than getting them to lose weight. Therefore, all healthcare professionals should devote more time to encouraging patients to do regular exercise and to think of exercise as a medicine that can be used in the primary and secondary prevention of virtually every chronic disease.

To achieve this in systematic fashion, Kaiser Permanente has instituted an ‘exercise vital sign’ (EVS) to ensure that every patient is asked about their exercise habits at every visit (Sallis, 2011). The EVS is recorded at the same time as the traditional vital signs of blood pressure, heart rate and temperature, together with data on each patient’s smoking habits and BMI. This allows quick identification of patients not meeting the US physical activity guidelines recommendation of 150 min per week of moderate or greater intensity physical activity. The easiest way to meet these guidelines is by breaking the requirement into 30 min periods that are done on 5 or more days each week. Walking can be considered to be the default mode of exercise prescription, because the majority of patients are able to do it and it tends to have the highest rate of compliance. However, it is important to note that any form of exercise confers

the same benefit provided it is done at a moderate pace. A moderate pace can be estimated by using the ‘sing–talk test’ (Foster *et al.*, 2008). This is done by having patients walk at a pace high enough that they cannot sing while exercising, but not so high that they cannot talk. Patients doing moderate intensity exercise should be able to carry on a conversation when doing so. A patient doing less than this recommended amount of exercise may be told something such as ‘today I notice your blood pressure is elevated and I notice you are not doing regular exercise. Before I put you on a medication, I would like you to try walking daily and cutting back on the salt in your diet. Then I would like you to come back over the next two weeks to re-check your blood pressure’. Often this simple exercise prescription is sufficient to control a patient’s blood pressure, blood sugar or even depression. But when exercise alone is not enough, then medications should be considered. Shifting the discussion away from a patient’s weight and more onto their physical activity habits, will have a more significant impact on their health and wellbeing.

Communication About Pet Obesity

Obesity is the most common nutritional disorder of dogs and cats, affecting up to half of pets, and is the most common nutritional disorder of human beings in developed countries. Weight management and nutrition should be part of health examinations and preventive care. It is well-known that obesity influences health, wellbeing and lifespan of dogs and cats; however, veterinary professionals continue to struggle to discuss obesity and educate clients about it (Morrisey and Voiland, 2007). Furthermore, convincing clients to adhere to weight reduction programmes for obese pets is often difficult for the veterinary healthcare team. This may create a cultural identity crisis within the team and result in inconsistent medical and communication standards, with mixed messages being delivered to clients with obese pets. Many veterinary healthcare teams are reluctant to tell a client that their pet is obese. They fear this information will offend, upset, anger or lose the client. This imagined outcome results in anxiety and promotes avoidance of the issue. When dietary recommendations are made, the advice may be disregarded or the desired weight loss is not achieved, leading to further discouragement for the veterinary healthcare team and client. Obesity is a major health concern for pets and it is a professional responsibility to address it as any other serious disease. Effective communication and treatment strategies must be designed to involve the entire healthcare team and

actively engage clients to successfully combat this epidemic (Cornell and Kopcha, 2007).

The following are elements for a successful weight loss programme for pets: (1) diagnosis of the problem, (2) patient and client centred care, (3) a team approach and (4) follow-up and adjustment of the plan. Recognition of obesity by the healthcare team is vital to begin the discussion. This is accomplished through periodic weighing and assigning a body condition score. Additionally, information on diet (i.e. type, amount and frequency of feeding), additional foods (e.g. treats, snacks and table food) and exercise should be ascertained.

The human–animal bond is strong with >70% of pet owners viewing their pet as a family member, even to the level of a child. A discussion with the pet owner should be undertaken based on the ‘stage of change’ that they are in. The ‘stages of change’ model also can be used to assess a person’s readiness to change behaviour. In this model, there are five stages of change, each having characteristic attitudes (Apodaca and Longabaugh, 2009).

The first stage is ‘precontemplation’, during which the person has no intention of taking action in the immediate future. These clients are often referred to as resistant, unmotivated, unaware, difficult and not ready or willing to change. Pet obesity discussion and intervention are usually ineffective; however, this is a time to begin discussion about weight concerns and development of a monitoring plan. Conveying care and concern for the pet rather than judgement allows the team to follow the patient and client, while being prepared to initiate a weight loss plan if and when the client moves to other stages of concern.

The second stage is ‘contemplation’, during which the person is aware of the pros and cons of changing a particular habit or lifestyle action and intends to change soon. These clients are stuck ‘thinking about it with intentions to change soon’. Providing further information about the health risks of obesity in a non-confrontational manner may help ‘unstuck’ them. Some aids for this discussion include body condition scoring charts, showing radiographs of an obese dog or cat, and discussing the costs of treating obesity-related diseases such as diabetes mellitus or osteoarthritis.

The third stage is ‘preparation (decision making)’, during which the person plans to take action very soon. Clients have recognized the problem of pet obesity and are seeking professional direction and guidance, in addition to reassurance that they are doing the right thing. They should be asked what they need to begin and how the healthcare team can help.

The fourth stage is ‘action’, during which the person has taken action that is significant enough to reduce the risks for disease. These clients should be helped to develop an active and dynamic plan with follow-up and encouragement. They should be reminded that weight loss will not occur overnight and not in a linear fashion.

The fifth stage is ‘maintenance’, during which the person continues action to accomplish the weight loss goal and to prevent relapse. These clients should be given information and permission for possible relapse and encouraged to continue follow-up and to seek help. The potential challenges they anticipate should be discussed and a positive strategy for possible solutions should be identified.

In talking with clients about obesity in their pet, motivational statements about changing their behaviour, also known as ‘change talk’, should be elicited and reinforced. Change talk statements during discussion consistently predict actual behaviour change in human medicine (Carcone *et al.*, 2016). Change talk statements are the client’s own thoughts about their desire, ability, reasons and need to change the unhealthy behaviour. ‘Commitment language’ is a special class of change talk that describes the client’s intentions and plans for enacting behaviour change, and is more closely linked to behaviour change than change talk (Prochaska *et al.*, 2009). ‘Motivational interviewing consistent communication’ (MICO) is an approach to healthcare patient/client communication that is characterized as a therapeutic conversation that employs a guiding style of communication geared towards enhancing behaviour change and improving health status (Douaihy *et al.*, 2015). The goal is to increase intrinsic motivation, engaging in an activity for reasons of personal interest or satisfaction rather than external consequences.

As clients become motivated to be part of the healthcare team for the health of their obese pet, an individualized weight loss plan may be devised. Weight reduction diets are available for pets; however, diet alone is insufficient to achieve the desired weight loss goal. In human medicine, exercise is an important component of weight loss and weight maintenance programmes. Increasing energy expenditure through exercise, in addition to altering energy intake, provides more consistent and better weight loss in dogs. Additionally, there are health benefits to the pet owner. This exercise should be defined and measurable. Just because the dog or cat goes into the backyard does not ensure that exercise is occurring. Planned walks of either time or distance and other exercise should be described in detail. This is easier for dogs than for cats; however, cats can be motivated to exercise by use of toys and by

forcing them to ‘hunt’ for their food. Some cats can be trained to walk on a lead or swim.

It is important to involve all members of the team when managing an obese pet (Churchill and Ward, 2016). The client must be ready as discussed above; however, the staff at the clinic have a vital role from check-in to check-out and follow-up. Mutual support and teamwork should be accomplished through consistent practice and training. Team members should use active learning skills and provide encouragement and guidance. All members of the healthcare team should be trained in effective communication in order to maximize the success of a weight reduction and maintenance programme and achieve client satisfaction.

One Health Approaches to Obesity

Despite decades of research into causes, risk factors and interventions for prevention and treatment, obesity remains a serious concern for people and companion animals alike. In the past 30 years, the prevalence of obesity in both people and animals has increased despite substantial efforts to address the problem (Ogden *et al.*, 2006; Flegal *et al.*, 2015; Larsen and Villaverde, 2016). Multicomponent lifestyle interventions (e.g. diet, physical activity and behavioural strategies) have shown the greatest efficacy for promoting weight loss (Jenson *et al.*, 2014). However, long-term maintenance of weight loss, regardless of how that weight loss was achieved, remains one of the greatest challenges to realizing effective treatment (German *et al.*, 2012; MacLean *et al.*, 2015). Furthermore, the sustained high prevalence of obesity in people and animals clearly indicates that strategies effective on a societal level for prevention of excess weight gain have yet to be elucidated.

The difficulty of the task of confronting obesity, whether through prevention or treatment, is due to the complexity of the problem. In any individual patient, the aetiology of obesity involves varying degrees of interactions between genetics, biology, environment and behaviour. Barriers to success are both behavioural and physiological. Difficulties with long-term adherence to regimes that promote weight loss successfully are believed to underlie the high recidivism rates seen in people (and animals), whether it involves dietary and/or physical activity interventions, and are viewed as alteration of the perceived cost:benefit ratio (Perri, 1998; Heymsfield *et al.*, 2007). From a physiological standpoint, adaptive biological mechanisms that are triggered by weight loss and negative energy balance (e.g. altered neurohormonal signalling, reduced metabolic rate,

increased metabolic efficiency, increased hunger, decreased satiety, etc.) must be overridden to prevent reversal of weight loss (Sumithran and Proietto, 2013).

What Does a One Health Approach to Obesity Look Like?

The principle behind One Health is interdisciplinary collaboration to promote the health of people, animals and the environment. With respect to the specific role of companion animals, the World Small Animal Veterinary Association One Health Committee (OHC) has proposed three areas of focus (see Table 1), the first two of which are particularly applicable to the undertaking of confronting obesity in people and animals. Using the OHC framework to address this challenge, we can take two approaches. Firstly, we can leverage the power of the human–animal bond to promote healthier lifestyles for people and their pets, and secondly, we can utilize comparative and translational clinical research to help us to achieve more effective strategies and better outcomes in the prevention and treatment of obesity, in particular the long-term maintenance of weight loss.

Leveraging the Human–Animal Bond

Unquestionably obesity is a significant public health issue and, as such, needs to be addressed at the societal level with respect to policy and the built environment. However, it is at the individual level where targeted solutions and strategies can harness the human–animal bond and prove extremely valuable. As already mentioned, decreased long-term adherence to successful weight loss regimes is thought to be a large contributing factor to weight regain. Over time the ability to adhere to the dietary choices, physical activity and/or behaviours that induce negative energy balance and contributed to the initial

Table 1
The World Small Animal Veterinary Association, One Health Committee, areas of focus for companion animals

1	The human–animal bond and the health benefits to people of interacting with companion animals
2	Comparative and translational clinical research in companion animals for the benefit of both animal and human health
3	The importance of surveillance and control for zoonotic infectious diseases shared between people and companion animals

Day, 2016.

success of the regime wanes. This scenario could apply equally to weight loss regimes for people or animals, as the success of a weight loss programme for an animal is entirely in the hands of its human caregivers.

Employing strategies that utilize the human–animal bond could prove to be a powerful means to maintain motivation and adherence to a regime. The People and Pets Exercising Together (PPET) study is an illustration of the implementation of this kind of strategy (Kushner *et al.*, 2006).

Lessons Learned from the PPET Study

The purpose of the 1-year, prospective, controlled PPET study was to assess the effectiveness of a combined people and pets weight loss programme (PP group, $n = 36$) where both human participants and companion dogs were obese. This people and pets social support condition was compared with people alone who did not own a companion animal (PO group, $n = 56$). Human participants in both groups were counselled on a calorie-controlled diet and to increase physical activity to 20–30 min per day. For the PP group, a veterinarian reviewed pet health tips, skills regarding dog walking and diet advice. All dogs were fed a study diet of Hill's Pet Nutrition Prescription Diet r/d (Hills Pet Nutrition Inc., Topeka, Kansas, USA) until they reached ideal body weight, then switched to Prescription Diet w/d. Both groups met weekly for the first 16 weeks (treatment phase), then monthly at months 5, 6, 9 and 12. Study outcome measures included weight loss, physical activity, dog-related activity (DRA), social support and narratives regarding the role that others played in achieving their goals.

Mean weight loss between the PP and PO group human completers did not differ significantly at 1 year (5.5% versus 6.6%, respectively). For the companion dogs, mean percent weight loss was 14.9% and body condition score improved from 4.6 to 3.3/5 (3/5 being considered ideal). For the PP group, self-reported average physical activity increased from 2.8 h per week at baseline to 3.9 h per week by month 12. For the PO group, the corresponding increase was from 1.9 to 3.5 h per week. Therefore, by the end of the study, both groups were engaging in an average of 30 min of physical activity per day. Approximately two-thirds of the activity in the PP group was spent as DRA for all time-points. Results of the qualitative analysis are shown in Table 2. Four major themes emerged that provided considerable sources of social support regarding motivation and encouragement from companion ownership; 'buddy', 'consistent initiator', 'enjoyment' and 'parental pride'. The PPET study was the first pro-

Table 2
Major social support and exemplary quotes for the companion animal themes identified by narratives from the People and Pet Group of the PPET Study

1	Buddy. 'My dog has been a motivator. Once I realized that my room-mate was not going to change, I turned to the pooch'.
2	Consistent initiator. 'Gresham (dog) sought me to walk every day. By 1.00 p.m., she started to pester me and became very aggressive until we walked (even on hot and rainy days)'.
3	Enjoyment. 'I love walking with my dog and it helps to motivate me'.
4	'Parental pride'. 'Knowing I could do something good for my dog was a motivating factor. She looks fabulous'.

PPET, People and Pets Exercising Together; Kushner *et al.*, 2006.

gramme to demonstrate the effectiveness of a combined PP weight loss programme. This approach to the dual obesity epidemic builds on the human companion animal social bond.

Addressing Unanswered Questions and Finding Novel Solutions through Comparative and Translational Research

A One Health approach involving companion animals holds a number of possibilities for advancing our understanding of the biological and behavioural causes of obesity and for developing effective strategies to prevent and treat this condition. Most of the animal research in the field of obesity has been done using laboratory animal models, specifically rodent models, which do not share the genetic diversity, psychosocial stressors and environment of people. Companion animals, on the other hand, more closely approximate people in at least some of these respects.

On the other hand, as with laboratory animals, companion animals have a shorter lifespan and investigations in these species could allow for studies of shorter duration than human clinical trials. Translational research involving companion animals could address a range of unanswered questions. For example, while there have been advances in technology with regard to measuring physical activity, there are still limitations on our ability to measure objectively components of energy balance (e.g. food and energy intake, dietary patterns and energy expenditure). As new technology emerges, validation in companion animals could lead to rapid translation to use in people. Another line of investigation to consider would be using companion animals to evaluate the impact of specific dietary components or strategies on weight loss and/or long-term maintenance of weight loss.

Next Steps

Given the clear potential of employing One Health strategies for finding novel approaches to the prevention and treatment of obesity, the next steps for promoting this tactic should include facilitating communication across disciplines, identifying and creating funding opportunities for One Health initiatives and, looking towards the longer term, promoting advocacy for policies that will support One Health solutions.

Communication. There already exist some platforms for creating interdisciplinary connections between scientists and clinicians working in the field of human and animal obesity. One example is the International Dog Walking Activity Group (ID-WAG) e-mail list that was created in 2009. This e-mail list allows people from a wide range of disciplines to share information regarding research, funding opportunities and publications about many different aspects of dog walking. Taking this kind of platform to the next step might be designing a website that could serve as a clearing house for a variety of special interest groups within the broad umbrella of One Health approaches to obesity. In addition to discussion boards, the website could serve, for example, as a repository for publications, clinical trials and information about spontaneous canine or feline models. It could create a means of connecting interdisciplinary groups that would work on shared definitions, criteria for outcomes and best practices for designing clinical trials and other types of research within a One Health framework. In addition to virtual communication, there should be continuing efforts to hold symposia to allow scientists and clinicians across disciplines to collaborate and network face-to-face. Lastly, communication efforts should include outreach to primary care practitioners and the public with relevant findings and interventions.

Funding Opportunities. One key strategy for promoting One Health solutions would be to identify and publicize existing funding opportunities from public and private sources. Even better would be to promote the creation of new funding (ideally from government and major foundations) that would be targeted at proposals that utilize a One Health design. Undoubtedly, access to funding would be a powerful stimulus for interdisciplinary collaboration and help to promote exploration of One Health solutions for the prevention and treatment of obesity.

Advocacy. Achieving effective advocacy in the public and private sectors is challenging and can be resource

intensive. However, the first step is crafting a compelling message and this is something that could be undertaken by a committed group of individuals, even at the early stages of organizing an initiative. Ultimately, because obesity is a public health issue, part of the solutions will involve policy changes and for One Health initiatives to be effective, proponents need a seat at the table.

Conclusions

Despite decades of attempts to find solutions, obesity remains a major global health problem for people and companion animals. Unquestionably there is great potential in employing a One Health framework to provide novel solutions for the prevention and treatment of this condition. Realizing this potential will take the efforts and leadership of a committed group of like-minded individuals representing a range of scientific and medical disciplines. Interested parties will need the means and opportunities to communicate and to collaborate, including resources and funding for research.

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Conflict of Interest Statement

The authors declare no conflict of interest with respect to publication of this manuscript.

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