

VET

Veterinary Emerging Topics (VET)[™] Report



When Age is *Not* the Culprit: Opportunities to Improve Outcomes in Arthritic Pets

January 2019





We are pleased to share the third annual Banfield Veterinary Emerging Topics (VET)[™] Report—a collaborative effort between Banfield Pet Hospital® and the North American Veterinary Community (NAVC).

As the largest general veterinary practice in the U.S., Banfield is committed to using its size and scale to conduct research that provides insights to our profession on topics that improve veterinary care for pets. NAVC is dedicated to advancing veterinary healthcare through education, collaboration and innovation by providing world-class continuing professional development and support services for the global veterinary healthcare community. Joining forces on the VET Report allows our two organizations to draw on our strengths to maximize the VET Report's reach and impact.

Our focus this year is on the relationship between and treatment of excess weight and osteoarthritis in dogs and cats. The percentage of pets who are considered overweight or obese has reached epidemic levels and is increasing annually. Similarly, diseases commonly associated with this condition—including osteoarthritis—are on the rise. These two conditions exacerbate each other, causing a cycle that continues to worsen pet health and negatively impact quality of life.

When it comes to managing osteoarthritis and excess weight, there are barriers for veterinary teams to ensure proper diagnostic and therapeutic management. Quality medical management of osteoarthritis requires a multi-faceted diagnostic and treatment plan. A combination of diagnostic testing, multi-modal pain management and weight management all need to be considered to most effectively improve patient outcomes.

We also need to think differently about how we approach these conditions. Core to this mindset shift are three necessary components: enhanced client communication, measurable patient outcomes for the pet owner, and the participation by the entire hospital team. Combined, these components help to increase engagement from the pet owner, ultimately resulting in higher compliance.

We believe that tackling osteoarthritis and excess weight need to be a priority for companion animal practitioners if we are to reverse current trends. We hope that the 2019 VET Report provides actionable insight into the barriers and opportunities that hospital teams face when treating pets with these conditions. As an industry, we face an uphill battle in treating osteoarthritis as excess weight becomes normalized; however, there are solutions within our reach and this report aims to highlight some of those opportunities.

Respectfully,



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CLINICAL BOTTOM LINE

Overweight pets are a growing problem in the United States. Efforts in the veterinary and pet care industry to address the excess weight problem have not been successful, as evidenced by the increasing percentage of overweight pets. A different approach to managing these pets is needed. Osteoarthritis (OA) and excess weight are conditions that commonly occur together, with each condition exacerbating the other. In 2017, of newly diagnosed cases of OA, 51.0% of dogs and 41.0% of cats were considered overweight. Treatment of these painful pets requires not only pain management through medications; it also requires management of weight to an optimal level and exercise, which benefits the OA pet by 1) increasing energy expenditure and 2) building and maintaining lean muscle mass, which can help reduce joint load. A focus on the pet's pain and the contribution of the excess weight to the discomfort may facilitate owner understanding of the seriousness of not only managing OA but also of weight loss.

A study of overweight, OA pets was performed to assess their diagnostic workup and therapeutic management in general veterinary practice and to identify barriers to providing recommended care. Challenges exist for both the veterinary team and the client in providing the recommended care to these pets. The study found that on the visit of first diagnosis, almost 50 percent of pets went home without pain management, and fewer than 10 percent went home with a veterinary diet for joint and/or weight management.

Perceived barriers to care included:

- + Cost
- + Owners not recognizing their pet is in pain and/or overweight
- + Client noncompliance
- + Hospital time constraints

Opportunities for veterinary hospital teams to reduce these barriers exist, and pursuing these could improve the quality of medical care affected pets receive. Support staff within the veterinary hospital could be utilized to facilitate the detection and management of these pets. Tools and technologies could be used to communicate to the client that their pet is in pain and, as a result, experiencing a decreased quality of life. This step could also help pet owners appreciate that therapeutic management benefits their pet through the assessment of various aspects of the OA pet's quality of life, such as pet mobility, activity levels and attitude. Management of these pets is multi-faceted and needs to be tailored to the individual pet and owner and with observable changes that can help keep owners engaged in the management of these overweight, OA pets.

INTRODUCTION

Improving the quality of care provided to veterinary patients is a responsible and important goal. In a field that evolves and changes regularly, staying abreast of new standards and methods of care is a key responsibility of veterinary professionals. Happily, improving quality does not involve going into uncharted waters. The science of quality improvement provides a great framework in which to work when striving to deliver better quality of veterinary care.

The 2017 and 2018 Veterinary Emerging Topics (VET)[™] Reports introduced the tenets of healthcare quality improvement through the Model of Improvement and applied the concepts to improving compliance with antimicrobial use guidelines. This 2019 VET Report continues the veterinary quality journey, introducing the Five Domains of Quality, which are modeled after the Institute of Medicine's Six Domains of Health Care Quality¹. Banfield has identified and defined the following Five Domains: safe, effective, pet- and client-centered, timely and efficient. Considering these domains while investigating veterinary care improvement opportunities can provide a more holistic approach and better results. This year's VET Report focuses on the comorbidity of two important conditions in pets, osteoarthritis (OA) and overweight, to demonstrate application of the domains through identified opportunities that can positively impact patient outcomes (*i.e., comfort, quality of life, mobility*). A more holistic approach to managing OA can also be a first step toward addressing the excess weight condition in these pets.

Dogs and cats are considered overweight if they are at least 10-20% heavier than their ideal weight². In 2017, approximately one-third of the Banfield canine (30.3%) and feline (33.2%) patients were recorded as overweight. The Association of Pet Obesity Prevention (APOP) reports 56-60% of dogs and cats were considered overweight in 2017³. Although the prevalence estimates differ, the conclusion is the same: overweight pets are common in the United States. And the prevalence is increasing – from 2007-2016, the prevalence of overweight pets in the Banfield dog and cat patients increased 158% and 169%, respectively⁴. It is clear that our traditional approaches to engaging owners to keep their pets at a healthy weight have not been working. A more concerted effort by the veterinary community is needed to stop this upward trend and bring pets closer toward more healthy weights.



The overweight condition in pets is associated with a number of serious health conditions, including joint disorders such as osteoarthritis⁵. Excess weight and OA are conditions that serve as risk factors for each other. In most pets, it would be difficult to discern which came first. Joint trauma can progress into OA that can lead to reduced mobility, which can cause weight gain. In some pets, there may be no known initiating joint trauma, but the excess weight contributes to the onset of OA. Along with increased joint load, the excessive adipose tissue in these overweight pets contribute to osteoarthritic inflammation through the release of inflammatory mediators (adipokines)⁶. Regardless of which came first, once started and without proper management, a vicious cycle of OA progression, reduced activity from reduced mobility, and weight gain ensues ([figure 1](#)).

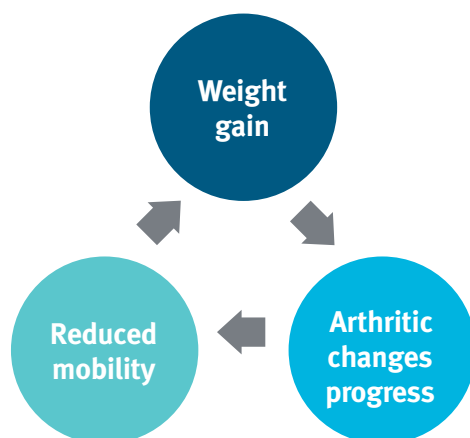


Figure 1:
Overweight-osteoarthritis cycle.

For both osteoarthritic and overweight conditions, detection at early onset is ideal, as proper management can stop or slow progression (in the case of OA) and lead to reversion (in the case of overweight) to a healthier condition. Unfortunately, in many cases, veterinarians and owners don't have serious conversations on weight management until the excess body weight is visible, meaning a larger amount of weight needing to be lost and decreasing the chance of successfully reaching an ideal body weight. Similarly, many pets are not assessed for or diagnosed with OA until they have developed the clinical signs of lameness and/or decreased mobility. Clinical management then is primarily pain management with medications and/or supplements as well as nutritional management and exercise to build and/or maintain lean muscle mass.

A review of newly diagnosed cases of OA within Banfield hospitals was performed to assess the commonality of these pets being overweight and to investigate diagnostic and treatment patterns in dogs and cats at the time of initial diagnosis. In addition, a select group of Banfield veterinarians was surveyed to identify general practices and factors that affect the clinical management of these pets. The findings from this study provide a baseline of information related to the medical care of these pets and a call-to-action for veterinary teams to ensure overweight, osteoarthritic pets receive the quality care they deserve, and their owners expect.



METHODS

A brief description of the methods used for this study is provided below. A more detailed description of the methods is available at [Banfield.com/VETreport](https://www.banfield.com/VETreport).

› Review of Patient Records

Cases of OA were defined as pets diagnosed with osteoarthritis or another orthopedic condition that can present similarly (*e.g., decreased mobility, lameness*) and cause chronic pain. Only those conditions that are associated with inflammation or potential progressive changes (*e.g., hip dysplasia, cruciate ligament rupture, spondylosis*) were included.

All canine and feline patients examined by a veterinarian at a Banfield Pet Hospital® from January 1 through December 31, 2017 were considered for inclusion. Patient records were used to identify those dogs and cats diagnosed with an OA condition for the first time in 2017, and a pet was considered overweight if he/she was recorded as overweight or obese that year. Because of the study focus on initial diagnosis, pets that had any OA diagnosis entered into their record prior to 2017 were excluded from the study population.

To investigate the medical care of overweight pets with an OA diagnosis, the invoice records for these patients were reviewed to identify whether diagnostic tests (complete blood count (CBC) and/or blood chemistry, radiographs, arthrocentesis) were performed and therapeutics dispensed. Bloodwork was a diagnostic of interest, not for the diagnosis of OA itself, but as an investigation into the assessment of patient health before starting pharmacologic pain management. For veterinary diets, sale of a joint or weight management diet or issuance of a prescription card was used to indicate whether nutritional therapy was included in the management plan.

To gain more detailed information about pet visits, a manual review of medical records for the visit of initial OA diagnosis was conducted for 2,250 randomly selected pets (1,500 dogs and 750 cats). The record review consisted of evaluating the medical notes for the following: the performance of any diagnostic tests and recording of a pain score. The diagnostic tests of interest in the review were whether at least one of the following was performed: CBC, blood chemistry, radiographs or arthrocentesis. When no diagnostic test was performed on that visit, evidence that any of the diagnostic tests were recommended was looked for. Finally, the record review included whether any pain score (*e.g., CSU acute pain scale*) was noted as part of the patient assessment.

› Survey of veterinarians' diagnostic and therapeutic recommendations

An online survey was conducted to better understand the practices in the diagnosis and management of newly diagnosed OA pets, as well as perceived barriers to providing recommended care. Survey invitations were sent to 118 Banfield veterinarians who are recognized by Banfield leadership as Veterinary Opinion Leaders (VOLs).

RESULTS

> Review of Patient Records

In 2017, 2,643,800 dogs and 535,932 cats were examined by a Banfield veterinarian. The prevalence of OA was 5.4% and 0.9% in dogs and cats, respectively. Looking only at pets who had not been diagnosed with an OA condition prior to 2017, the incidence of OA was 275.4 cases per 10,000 dogs and 58.7 cases per 10,000 cats (table 1). Of these newly diagnosed OA pets, 51.0% of dogs and 41.0% of cats were recorded as overweight. The majority (81.9% and 93.4% of dogs and cats, respectively) of these new OA cases were diagnosed with either arthritis or degenerative joint disease (DJD).

Table 1: Incidence of OA in the 2017 Banfield Pet Hospital population.

OA condition	Canine			Feline		
	No. new cases	Incidence (per 10,000 pets)	% Overweight	No. new cases	Incidence (per 10,000 pets)	% Overweight
Hip/Pelvis	4,348	16.5	44.7	53	1.0	52.8
Ligament/Tendon	9,921	37.6	56.1	78	1.5	50.0
Arthritis/DJD	57,843	224.1	51.1	2,973	55.7	40.4
OCD	135	0.5	40.0	1	0.0	0.0
Spondylosis	1,891	7.2	48.9	78	1.5	57.7
Synovitis	83	0.3	42.2	0	0	-
Overall	70,799	275.4	51.0	3,136	58.7	41.0

A pet may have been diagnosed with more than one OA condition during 2017. “Hip/pelvis” conditions include osteoarthropathy of hip/pelvis, hip dysplasia and Legg-Perthes disease. “Ligament/tendon” conditions include ligament and tendon ruptures, as well as meniscus injury.

For these overweight, newly diagnosed OA cases, most (74.3%) had either a CBC and/or blood chemistry panel performed during one of the three visits in the diagnostic period (table 2). Radiographs were performed in 27.8% of the canine and 22.7% of the feline cases. Radiographs were more commonly performed for the smaller pools of dogs diagnosed with spondylosis or the conditions affecting the hip/pelvis (86.2% and 64.2%, respectively). Only four of the dogs and none of the cats had a joint tap as part of their diagnostic regimen. No diagnostics beyond the physical examination were performed for 15.8% of the dogs and 17.7% of the cats.

Table 2: Proportion of overweight and newly diagnosed OA pets that had diagnostic test performed during the 3-visit diagnostic period.

	CBC and/or Blood Chemistry	Radiograph	Joint Tap
Canine	26,817 (74.3%)	10,048 (27.8%)	4 (0.0%)
Feline	956 (74.3%)	292 (22.7%)	0 (0.0%)

Non-steroidal anti-inflammatory drugs (NSAIDs) were the most commonly prescribed medication for dogs (33.2%; table 3), followed by other analgesics (21.6%) and supplements (16.7%). Treatment patterns for cats were slightly different, with a supplement (22.7%) most commonly dispensed, followed by other analgesics (19.5%) and NSAIDs (19.4%). Almost half (46.7% of dogs and 48.6% of cats) were not dispensed any medication or supplement. Relatively few (< 10%) of dogs or cats received a veterinary diet or were issued a prescription card for one.

Looking at full diagnostic and therapeutic management options upon initial OA diagnosis (table 4), the largest percentage of canines (43.8%) and felines (39.7%) received some level of diagnostics plus a therapeutic intervention. Conversely, less than 5% of the pets received some component of all three interventions: diagnostics, therapeutics and a veterinary diet. Almost 10% of canines and felines received none of these services/products.

The manual record review of the 2,250 randomly selected visits of first OA diagnosis found at least one of the diagnostic tests were performed in 47.9% of the canine and 50.0% of the feline cases. Diagnostics were offered and declined or postponed for 19.6% of the canine and 22.4% of the feline cases. The manual record review found no mention of any diagnostic recommendations in approximately 32.5% of canine and 27.6% of feline cases.

Finally, a pain score was recorded in 3.5% of the canine and 4.1% of the feline visits.

› Survey of Veterinarians

Fifty (42.4%) of the 118 veterinarians contacted completed the survey. This is slightly lower than the average response rate (55%) for VOL surveys. Key findings regarding patient assessment and barriers to recommendations are presented in figures 2-5.

Most veterinarians report performing orthopedic examinations and nutritional assessments and recommending radiographs, with the percentage performing neurologic examinations being lower (figure 2). Almost half report often sending pets home on a pain medication trial before performing diagnostics. A major perceived barrier for both performing diagnostics and dispensing therapeutic medication was cost (figures 3 and 4). Some survey respondents commented that for some cases, owners were unable to afford both, having to decide between paying for diagnostics and paying for treatment. Another barrier to diagnostics included insufficient time during an appointment to perform the needed diagnostics (figure 3).

In addition to cost, perceived barriers to pain management commonly included owners not appreciating their lame pet as being in pain and owner noncompliance in the therapeutic regimen and/or the recommended follow-up hospital visits (figure 4).

Table 3: Therapeutic treatment statistics for those overweight, newly diagnosed OA dogs and cats in 2017.

	Canine	Feline
<i>Therapeutic Category</i>	<i>% Pets receiving</i>	<i>% Pets receiving</i>
NSAID	33.2%	19.4%
Other analgesic	21.6%	19.5%
Corticosteroid	1.7%	2.9%
Muscle Relaxant	0.8%	0.1%
Supplement	16.7%	22.7%
Veterinary Diet	6.3%	8.8%

Table 4: Diagnostic-therapeutic management for overweight, newly diagnosed OA cases.

	Canine	Feline
Diagnostic(s) only	34.9%	35.5%
Therapeutic(s) only	5.5%	6.2%
Veterinary Diet Only	0.4%	0.5%
Diagnostic(s) + Therapeutic(s)	43.8%	39.7%
Diagnostic(s) + Veterinary Diet	1.9%	2.8%
Therapeutic(s) + Veterinary Diet	0.4%	1.2%
All three components	3.6%	4.3%
None	9.5%	9.8%

Figure 2. Survey responses regarding patient assessment practices by veterinarian during OA-suspect visits.

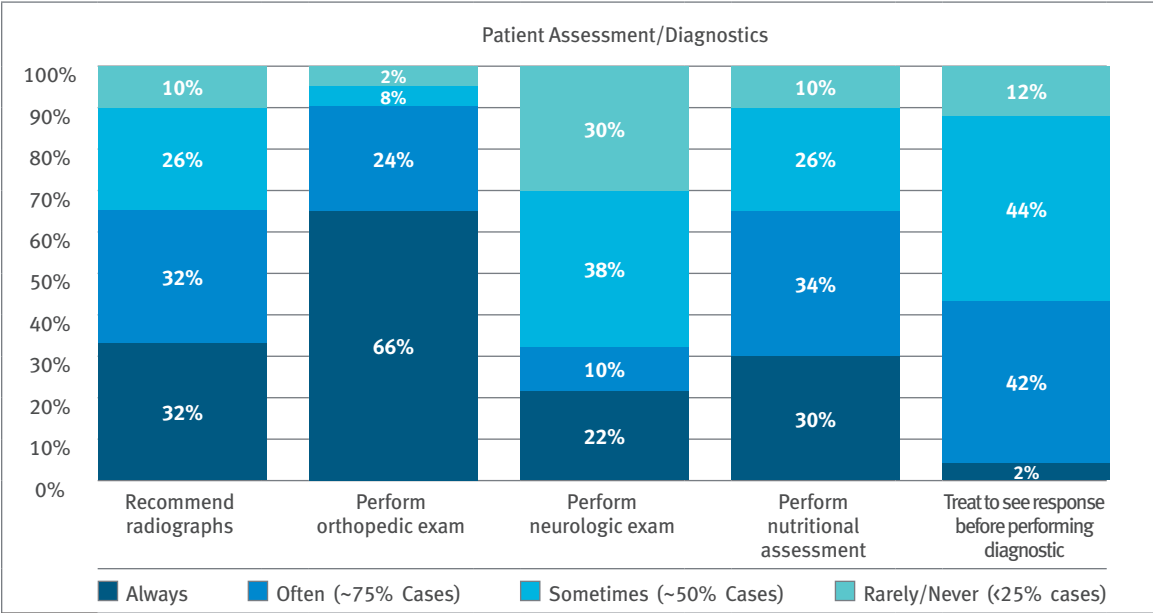
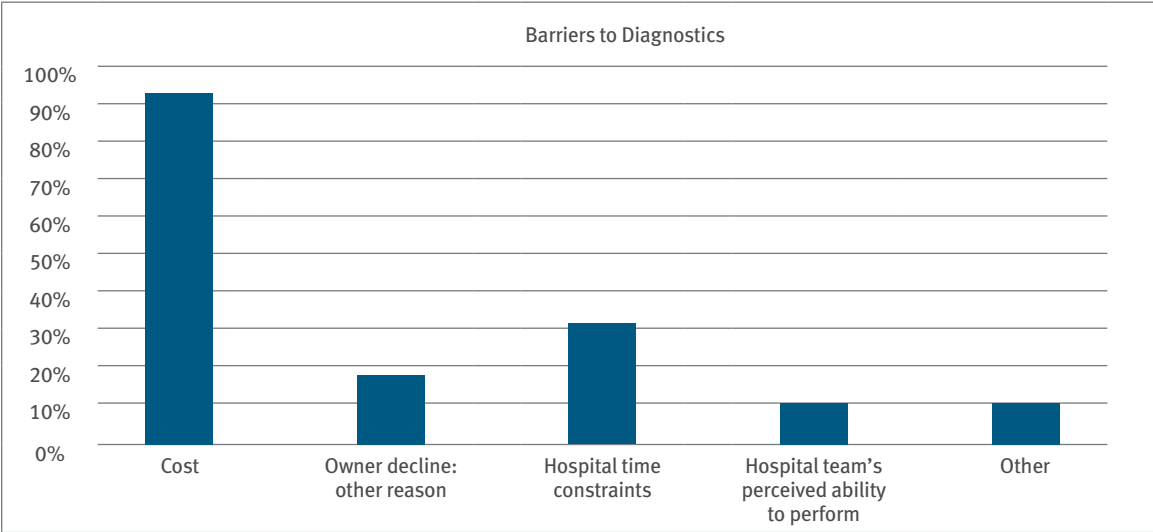


Figure 3. Survey responses to barriers to performing diagnostics for OA-suspect cases.



Respondents were able to select multiple responses. “Other” barriers for diagnostics included: existing behavioral or medical conditions that preclude ability to perform or recommending diagnostic tests, patient not fasted for sedation or anesthesia for radiographs, or radiographs postponed for another visit (e.g., when under anesthesia for another procedure, such as dental prophylaxis).

Figure 4. Survey responses to barriers to initiating recommended pain management for OA-suspect cases.

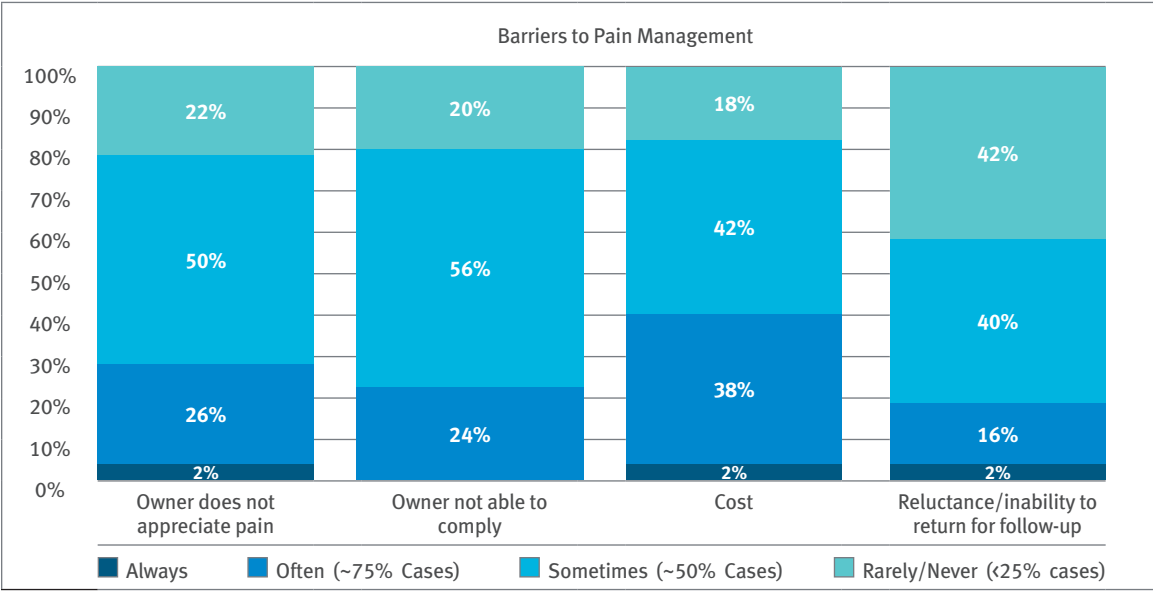
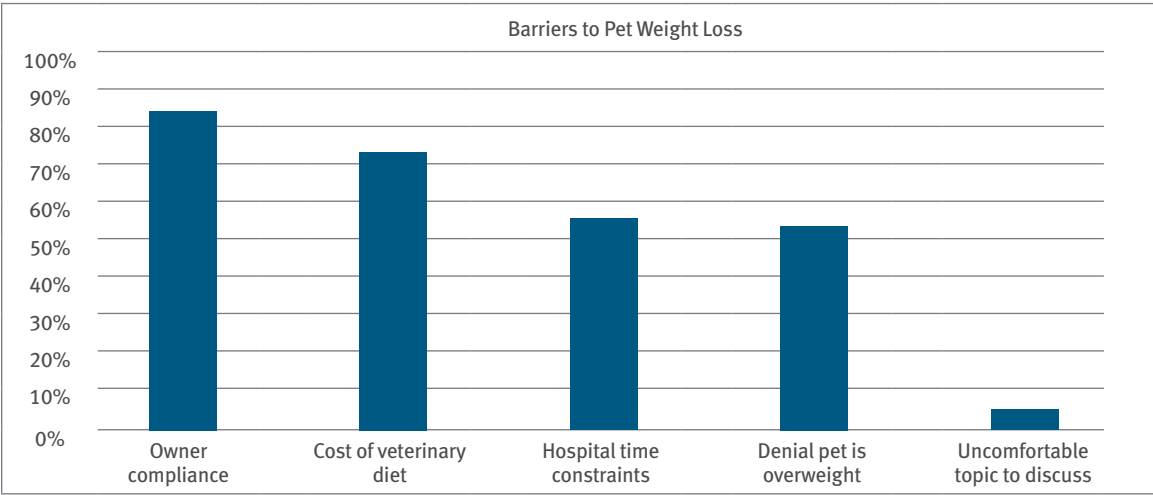


Figure 5. Survey responses to barriers to pet weight loss for OA-suspect cases.



Respondents were able to select multiple responses.

Regarding pet weight loss (figure 5), over 70% of survey respondents indicated owner noncompliance and cost of veterinary diets as barriers to successful weight loss programs. Hospital time constraints to properly counsel pet owners and owners not acknowledging the weight problem were also indicated by over 50% of respondents. The topic of the overweight condition being an uncomfortable one to discuss with some owners was not perceived to be a barrier by most responding veterinarians.

Almost all respondents (96%) felt that cats have unique challenges, compared to their canine counterparts. Some barriers noted by respondents included the lack of FDA-approved NSAIDs for long-term use, fewer medication and supplement options, difficulty in increasing feline activity levels, and challenges with changing diets (*e.g., picky eaters*).

DISCUSSION

It is the veterinary team's responsibility to ensure timely recognition and proper management of OA to optimize improvement in the pet's comfort, mobility and quality of life. Familiarity with the most up-to-date guidelines for managing chronic pain through a multi-modal approach (the most recent published in the last few years^{7,8}), staying up-to-date as new medications enter the market, and ensuring appropriate pain management of affected pets are the key components to delivering quality medical care to every OA pet, every visit.

This study was conducted to look at diagnostic and therapeutic practices in a general veterinary practice. While guidelines and therapeutics exist, this study found that following and incorporating these into the management of OA in a general veterinary practice is challenging, for both the veterinary team and the pet owner.

Given the current understanding of the overweight-osteoarthritis cycle ([figure 1](#)), it is not surprising that a sizable proportion of newly diagnosed OA cases are also overweight. The growing percentage of overweight pets and the findings of this study suggest that perhaps veterinary professionals need to re-think how they approach and partner with owners to better manage these pets to improve their comfort, mobility and quality of life. This study provided evidence that pets are not receiving a full complement of therapeutic management for these conditions and identified potential causes for this. Through this work, several major areas of opportunity to improve OA management have been identified.

› Opportunity #1: Dispensing pain medication for OA pets

A major opportunity exists around ensuring that pain medications are dispensed to those pets that may benefit from analgesic or joint support therapy. In this study, almost half of pets diagnosed with OA did not receive pain medications at the time of diagnosis. The survey provided some perceived insights into the barriers to treatment (*e.g., cost, owner not recognize lame pet is in pain*), and further research may provide more insights. Identifying these barriers and finding solutions to reduce them (*e.g., incorporating pain index instrument*) will facilitate more pets receiving quality care from initial presentation through therapeutic management, thereby improving the pet's comfort, increasing his/her mobility, and demonstrating value of the therapeutic management to the pet owner.

› Opportunity #2: Tools for early identification or recognition

Owner lack of appreciation of pain in their pets was perceived as a barrier in both initiating and continuing the management plan. Client education materials (including illustrations of postures and behavior of pets with and without pain) would be beneficial to facilitate client understanding that what they consider normal for an older pet is really *not* normal. Also, having owner track activity levels as well as ease/difficulty in doing some activities (*e.g., stairs*), through the use of pet activity monitors (or otherwise routinely logging the information, including recorded video when the pet is active) or a validated quality of life (QoL) or chronic pain index instrument may facilitate owners to notice changes in their pets over time, both pre- and post-treatment. The inconvenience of these can be minimal to owners, as these do not require extensive training or commitment beyond keeping notes and/or routinely answering questions without bringing their pet to see a veterinarian. This may also help keep the client engaged in their pet's management plan as they hopefully see (measurable) effects of the treatment on their pet through increased mobility and activity levels and overall quality of life.

Use of a QoL or pain index instrument can also be included in the routine assessment for every pet at every visit. This would benefit the pet overall, providing a supplemental evaluation for conditions that may impact quality of life or cause pain/discomfort, not just OA. This study suggests that there are general practice veterinarians who want to record pain/comfort in a way that enables monitoring for changes.

› Opportunity #3: Incorporation of nutritional component

A low percentage of pets were issued a prescription card for or were sold a joint/mobility and/or weight management diet. While cost of veterinary diet was reported as a barrier by survey respondents, further investigation into this may find other explanations for this low rate, such as the diet sold during another visit, the pet is on another veterinary diet due to a comorbid condition, or other barriers (*e.g., cats can be picky eaters*). Nutritional management is an important component of the multi-modal approach to managing OA patients. Recent surveys indicate that pet owners want their veterinarian to provide diet or other nutrition recommendations for their pet^{3,9}. If additional barriers can be identified and addressed, this is an opportunity that the veterinary community can seize to meet (or exceed) owners' needs and expectations for a component of their pets' basic care.

› Opportunity #4: Weight management

Optimizing the pet's weight toward a healthier or ideal weight is an integral component in management of these pets⁷. Research has found that losing as little as 6.1% of their weight in obese dogs^{10,11} can lead to improvement in the clinical signs of OA. In addition, overweight dogs have reduced quality of life^{12,13}, and weight loss improved subjective scores for activity and quality of life^{12,14}. While all OA pets would benefit from incorporating a nutritional component into their management plans, the 2017 Banfield data indicates that a sizable proportion of the newly diagnosed OA population would likely benefit by losing some weight.

Pet weight loss can be challenging for both veterinary teams and pet owners and, as indicated in the survey, owner compliance is felt to impact the success. Owner recognition or acknowledgement that their pet is overweight is the first step in the pet's weight loss journey, and owner engagement can wane if the owner does not see appreciable change and/or the longer the pet is in a weight loss program¹⁵. Guidelines^{2,15} and tools (*e.g., Obesity Toolkit*¹⁶) may facilitate owner engagement throughout their pet's weight loss journey.

› Opportunity #5: Patient management as a team effort

In a time when the prevalence of overweight pets is increasing, and given the link between being overweight and OA, veterinary teams may want to enhance staff functions to include everyone in the hospital as part of patient management. For example, from patient check-in to check-out, every team member (including front reception staff) can serve as an extra set of observant eyes to notice abnormal gait or more subtle signs of OA before the veterinarian examines the pet. For activity and weight management, not relying solely on the veterinarian but also other trained team members for weight check-ins and diet consultations. An overweight, OA pet's journey to improve his condition goes from being a one-person (veterinarian) effort to a team effort and does not limit owner consultations to the availability of the veterinarian.

DOMAINS OF QUALITY

Previously, the VET Report has introduced the veterinary community to the science of quality improvement, from which many tools can be adapted to veterinary medicine with the objective of improving quality of care and patient outcomes. These tools can be used to assess interventions and implement changes to help reach desired results.

One such tool for assessing quality that has been applied at Banfield Pet Hospital is called the Five Domains of Quality, a slight modification of a framework developed by the Institute of Medicine called the Six Domains of Health Care Quality¹. Slight modification allows the framework to adapt seamlessly to veterinary care. The Five Domains of Quality are: safe, effective, pet- and client-centered, timely and efficient, and are described below.

- ✦ **SAFE:** Having the right culture, systems and equipment in place to create a safe environment for associates, clients and pets, thus avoiding harm.
- ✦ **EFFECTIVE:** Providing the care that meets quality standards of our profession.
- ✦ **PET- AND CLIENT-CENTERED:** Building relationships to become a trusted partner to our clients, and identifying the unique, individual needs of each pet to provide appropriate care.
- ✦ **TIMELY:** Seeing pets when they need to be seen to help keep them healthy, prevent future disease and treat current disease.
- ✦ **EFFICIENT:** Managing use of resources to minimize waste and maximize the value of care provided.

A veterinary clinic or hospital can work with this framework to address the care of their OA patients to ensure they are assessing the care provided in a holistic manner.



› Applying the 5 Domains of Quality to care delivery for OA pets

SAFE

- + Perform full physical examination, as well as CBC and blood chemistry as appropriate at baseline before starting on long-term pain medications and at regular intervals to monitor for changes in health status and to adjust treatment plan accordingly.

EFFECTIVE

- + Stay abreast of guidelines and new medications to properly diagnose and treat these cases of OA.
- + Ensure pharmacy and diagnostic offerings are up-to-date and aligned with current standards of care.
- + Implement validated tools, such as QoL or pain index instruments, to assess effectiveness and modify therapeutic management as appropriate.

PET- and CLIENT-CENTERED

- + Engage clients in their pet's health by utilizing tools that enable them to recognize their pet is osteoarthritic and/or overweight earlier and develop a management plan tailored for their pet and home environment.
- + Partner with clients to develop the best diagnostic and treatment plans that meet their needs and expectations (including not breaking their pocketbook).

TIMELY

- + Ensure that all hospital team members are capable of meeting the needs of pets and clients, from scheduling pets when they need to be seen to providing diagnostics and treatment to follow-up conversations to assess adequacy of the management plan.

EFFICIENT

- + Involve other hospital team members in joining the conversation with owners about their pet's condition and management. This may allow follow-up questions or consultations (*e.g., weigh-ins*) to not necessarily be dependent on the availability of the veterinarian but may be handled by other trained team members (*e.g., licensed or registered veterinary technicians*).
- + When it is known that an overweight pet is coming in for lameness or mobility changes, schedule additional time for the pet's visit to ensure recommended diagnostics and nutritional counseling can be provided.



CONCLUSION

Managing OA, particularly when occurring in a pet with excess weight, is not new to the veterinary profession. Opportunities exist to improve the care these affected pets receive. Adjustments and new approaches are needed to help pet owners better understand the impacts of these conditions on their pets' lives. Not only does this include performing proper/complete physical examinations and making complete diagnostic and pain management recommendations; this also includes enabling owners to understand the impact of these conditions on their pet and the benefits (or value) of the therapeutic management.

Modern technology enables us to incorporate new tools and technologies that may help owners provide more information (*e.g.*, *activity tracking*) to hospital teams and also help pet owners see the benefits of the management plan, keeping them engaged in their pet's management. By being aware of key opportunities and keeping the Five Domains of Quality in mind, a veterinary team can develop a plan with the goal of improving pet patient outcomes (increased comfort, mobility and quality of life) and deliver on this plan with improved care for their OA patient population.



REFERENCES

1. Committee on Quality of Health Care in America, Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. 2001; Washington DC: National Academies Press.
2. Brooks D, Churchill J, Fein K, Linder D, Michel KE, Tudor K, Ward E, Witzel A. 2014 AAHA Weight management guidelines for dogs and cats. JAAHA. 2014; 50: 1-11.
3. Association of Pet Obesity Prevention. 2017 Pet Obesity Survey Results. Available at: <https://petobesityprevention.org/2017/>. Accessed: August 10, 2018.
4. Banfield Pet Hospital. 2017 State of Pet Health. Available at: <https://www.banfield.com/state-of-pet-health/obesity>. Accessed: August 10, 2018.
5. German AJ. The growing problem of obesity in dogs and cats. J Nutr. 2006; 136(7 Suppl):1940S-1946S.
6. Frye CW, Shmalberg JW, Wakshlag JJ. Obesity, Exercise and Orthopedic Disease. Vet Clin Small Anim. 2016; 46: 831-841.
7. Epstein M, Rodan I, Griffenhagen G, Kadrlik J, Petty M, Robertson S, Simpson W. 2015 AAHA/AAFP Pain Management Guidelines for Dogs and Cats. JAAHA. 2015; 51: 67-84.
8. Mathews K, Kronen PW, Lascelles D, Nolan A, Robertson S, Steagall PVM, Wright B, Yamashita K. WSAVA Guidelines for recognition, assessment and treatment of pain. JSAP. 2014; 55: E10-68.
9. Mars Petcare. New survey weighs up potential reasons behind the pet obesity crisis. Available at: <https://www.mars.com/global/our-news/our-stories/new-survey-weighs-up-potential-reasons-behind-the-pet-obesity-crisis>. Accessed: August 10, 2018.
10. Marshall WG, Hawewinkel Haw, Mullen D, De Meyer G, Baert K, Carmichael S. The effect of weight loss on lameness in obese dogs with osteoarthritis. Vet Res Commun. 2010; 34: 241-253.
11. Impellizeri JA, Tetrick MA, Muir P. Effect of weight reduction on clinical signs of lameness in dogs with hip osteoarthritis. JAVMA. 2000; 216: 1089-1091.
12. German AJ, Holden SL, Wiseman-Orr ML, Reid J, Nolan AM, Biourge V, Morris PJ, Scott EM. Quality of life is reduced in obese dogs but improves after successful weight loss. Vet J. 2012; 192: 428-434.
13. Yam PS, Butowski CF, Chitty JL, Naughton G, Wiseman-Orr ML, Parkin T, Reid J. Impact of canine overweight and obesity on health-related quality of life. Prev Vet Med. 2016; 127: 64-69.
14. Flanagan J, Bissot T, Hours M-A, Moreno B, Feugier A, German AJ. Success of a weight loss plan for overweight dogs: the results of an international weight loss study. PLoS ONE. 2017; 12: e0184199.
15. German AJ. Obesity prevention and weight maintenance after loss. Vet Clin Small Anim. 2016; 913-929.
16. AVMA. Obesity: a toolkit for veterinarians. 2018. Available at: <https://www.avma.org/KB/Resources/Reference/Pages/Fighting-Obesity-Toolkit-for-Veterinarians.aspx>.

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