

# TOP 5 Clinical Consequences of Obesity

Deborah Linder, DVM, DACVN  
Tufts University

Studies published nearly a decade ago reported that up to 34% of adult dogs and 35% of adult cats in the United States were overweight or obese.<sup>1,2</sup> Prevalence among studies has differed; however, a more recent study reported that 63% of cats are overweight or obese.<sup>3</sup> Not surprisingly, many studies have offered evidence of the detrimental consequences of excess weight in pets.<sup>1-3</sup>

Although not all clinical signs are overt, being overweight has been associated with many conditions that put a patient's health at risk. Most data show only an association between obesity and disease, rather than direct causation; however, as evidence accumulates on the correlation between excess weight and disease, it is fair to assume that being lean is healthier.

## DOGS

### 1

#### Poor quality & quantity of life

Some of the most compelling evidence that obesity is harmful to the quality and quantity of life in pet dogs is easy to relay to owners. A lifetime study of Labrador retrievers found that dogs with an ideal body condition score (BCS) of 4/9 to 5/9 lived a median of 1.8 years longer than their slightly overweight counterparts with a BCS of 6/9 to 7/9.<sup>4</sup> The slimmer dogs also had delayed onset of chronic illnesses.

Although some owners have expressed guilt or fear about depriving food as a rationale for not initiating weight loss plans, one study has shown decreased quality of life when pets are overweight and improvement in quality-of-life measures (eg, vitality, emotional disturbance, pain) after successful weight loss.<sup>5</sup> Discussing the deleterious consequences of obesity and the benefits of weight loss may help alleviate owner concerns regarding weight management plans.

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BCS = body condition score



#### Top 5 Clinical Consequences of Obesity

##### Dogs

1. Poor quality & quantity of life
2. Osteoarthritis
3. Intervertebral disk disease
4. Subclinical conditions
5. Cardiorespiratory effects

##### Cats

1. Diabetes
2. Urinary disease
3. Osteoarthritis
4. Subclinical conditions
5. Poor quality & quantity of life

## DOGS

## 2

**Osteoarthritis**

One heavily studied disease process associated with the mechanical and functional effects of obesity is osteoarthritis. Maintaining an ideal weight has proven benefits in the prevention and treatment of this debilitating condition.

In a lifetime study of Labrador retrievers, leaner dogs had delayed onset of osteoarthritis as compared with their overweight counterparts.<sup>4</sup> Although the mechanism is not completely understood, many have speculated that merely increasing physical force on the joint in overweight dogs would cause sufficient joint stress to result in osteoarthritis. Other theories have suggested that the proinflammatory nature of adipose tissue may cause an inflammatory and painful state within the joint.<sup>6</sup> Regardless of cause, however, lameness and pain in dogs can be alleviated with weight loss. As little as 6% to 8% loss of total body weight has led to significant decreases in subjective and objective lameness scores.<sup>7</sup>

## DOGS

## 3

**Intervertebral disk disease**

Weight management is strongly recommended in dogs predisposed to intervertebral disk disease (IVDD).

Recommendations were previously based on anecdotal evidence, with the assumption that excess weight may cause additional stress on calcified disks and

increase the risk for disk extrusion. One study of 700 dogs showed that obese dogs of all breeds were at increased risk for IVDD; but even being moderately overweight increased the risk in high-risk breeds (particularly the miniature dachshund [Figure 1]).<sup>8</sup> In another study, dogs that underwent surgery for IVDD were 7.62 times more likely to be ambulating without assistance at the initial 3- to 4-week follow-up if they had a BCS of 6/9 or less.<sup>9</sup>

## DOGS

## 4

**Subclinical conditions**

In dogs, obesity has been related to increased inflammatory mediators, hypercholesterolemia, hypertriglyceridemia, hyperinsulinemia, increased circulating leptin levels, and decreased circulating ghrelin levels.<sup>10,11</sup> Because these endocrine-mediated changes may lead to such diseases as pancreatitis and diabetes, biochemistry panels are recommended in overweight pets without signs to monitor for abnormalities before diseases become apparent. In addition, because hypothyroidism is known to cause weight gain in dogs, thyroid levels should be checked routinely to rule out this disease. Of note, many overweight dogs have normal thyroid levels. Subclinical conditions can be challenging to discuss with owners of overweight pets because the consequences are not readily apparent; however, the ideal time to address weight management is before signs become evident.

## DOGS

## 5

**Cardiorespiratory effects**

Obesity in dogs has been associated with various cardiac and respiratory conditions (although dogs are not at risk for coronary artery disease as are humans). Mild cardiac changes were noted in experimental studies of weight gain in dogs,<sup>12</sup> and resting and recovery heart rates were also shown to be affected by BCS and exercise in pet dogs.<sup>13</sup> Most notably, obesity has been linked to airway dysfunction<sup>14</sup> and tracheal collapse.<sup>15</sup> Although the exact benefits have not been studied, weight loss is considered part of the standard treatment for many respiratory conditions, including those previously listed, laryngeal paralysis, and others.

## CATS

## 1

**Diabetes**

In cats, diabetes is the clinical consequence with the strongest correlation to obesity. Not only is obesity a risk factor for diabetes,<sup>16</sup> but weight loss is a mainstay of treatment for diabetic cats and increases the likelihood of remission.<sup>17,18</sup> Because significant endocrine-mediated changes can be evident on laboratory screening before clinical disease is apparent, biochemistry panels (looking for hyperglycemia and altered lipid profiles) are routinely recommended for any overweight cat. Insulin sensitivity can decrease with obesity, and glucose tolerance and lipid profiles can be altered in cats with excess weight.<sup>19-21</sup> Such impaired insulin sensitivity has been associated with obesity, even in cats younger than 1 year of age,<sup>22</sup> highlighting the need for preventive and aggressive weight management.

## CATS

## 2

**Urinary disease**

Obesity reportedly plays a role in the feline urinary system. Obesity has been shown to be a risk factor for feline lower urinary tract disease,<sup>2</sup> and weight loss—along with dietary and



Overweight miniature dachshund recovering from surgery for intervertebral disk disease

BCS = body condition score, IVDD = intervertebral disk disease

stress management—is considered part of potential treatment strategies for feline urolithiasis.<sup>23</sup> Although further studies in cats are warranted, obesity in dogs has also been linked to functional and structural changes in the kidneys, suggesting that obesity may be a potential risk factor for renal disease as well in other companion animals.<sup>24,25</sup> Encouraging physical activity and environmental enrichment may help cats maintain a healthy weight and reduce the risk for lower urinary tract disease.

### CATS 3

#### Osteoarthritis

Similar to osteoarthritis in dogs, osteoarthritis in cats is believed to be associated with obesity. Maintaining an ideal body weight has shown bene-

fits in preventing and treating osteoarthritis in many species. Compared with lean cats, heavy cats were almost three times more likely to present for lameness not associated with bite trauma.<sup>16</sup> In addition, obese cats were almost five times as likely to develop lameness that required veterinary care.<sup>16</sup> As in dogs, the mechanism is not completely understood but may be related to increased physical force causing stress on joints. Other theories have suggested that the proinflammatory nature of adipose tissue may induce pain and inflammation in the joint space.<sup>6</sup>

### CATS 4

#### Subclinical conditions

Studies in humans and other animals have shown the important role of adipose tissue in maintaining healthy weight. As an individual becomes heavier, adipose tissue increases the production of hormones and inflammatory mediators (eg, adipokines [leptin]) that can have considerable clinical and subclinical effects on the body.<sup>10</sup> These effects can predispose to or exacerbate diseases through a proinflammatory process (ie, adipose tissue producing inflammatory

cytokines [tumor necrosis factor- $\alpha$ , interleukin-6]).<sup>10,26</sup> In cats, hypothyroidism is rare and usually only seen as a result of iatrogenic overtreatment of hyperthyroidism. However, many subclinical changes that occur in overweight cats can be assessed on biochemistry panels before clinical disease becomes apparent (eg, hyperglycemia, hyperlipidemia).<sup>19-21</sup> Subclinical conditions can be difficult to discuss with owners, but diabetes in particular is best diagnosed early in cats, as prevention is easier than treatment.

### CATS 5

#### Poor quality & quantity of life

Evidence has shown that obesity can be harmful to cats with regard to quality and quantity of life. Although

anecdotal, evidence from canine studies can be extrapolated to cats. Like dogs, cats with an ideal BCS are likely to live longer and have a better overall quality of life than their overweight counterparts.<sup>4</sup> Likewise, owners may have feelings of guilt or fear about depriving their cats of food as rationale for not initiating weight loss.<sup>5</sup> Discussing the potentially severe consequences of obesity and the benefits of weight loss for improving quality of life and alleviating pain and suffering may help lessen owner concerns about implementing weight management.

#### Closing thoughts

Even if signs are not apparent, obese patients reportedly have higher anesthetic risks and medical costs and require special consideration when dosing medications with narrow safety ranges.<sup>27,28</sup> Excess weight is easier to prevent than treat, so conveying the urgency of weight management before consequences are apparent can help keep patients healthier and happier. ■ **cb**

See **Aids & Resources**, back page, for references & suggested reading.

#### Surolan®

otic suspension

(miconazole nitrate, polymyxin B sulfate, prednisolone acetate)

Antifungal, antibacterial and anti-inflammatory  
For otic use in dogs only

#### CAUTION

Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

#### INDICATIONS

SUROLAN is indicated for the treatment of canine otitis externa associated with susceptible strains of yeast (*Malassezia pachydermatis*) and bacteria (*Staphylococcus pseudintermedius*).

#### CONTRAINDICATIONS

SUROLAN is contraindicated in dogs with suspected or known hypersensitivity to miconazole nitrate, polymyxin B sulfate, or prednisolone acetate. Do not use in dogs with known perforated tympanum. Do not use with drugs known to induce ototoxicity.

#### WARNINGS

Not for use in humans. Keep this and all drugs out of reach of children.

#### ANIMAL WARNINGS

Do not administer orally. For otic use only.

#### PRECAUTIONS

Before instilling any medication into the ear, examine the external ear canal thoroughly to be certain the tympanic membranes are not ruptured.

If overgrowth of non-susceptible bacteria or fungi occurs, treatment should be discontinued and appropriate therapy instituted.

Long-term use of topical otic corticosteroids has been associated with adrenocortical suppression and iatrogenic hypoadrenocorticism in dogs.

The safe use of SUROLAN in dogs used for breeding purposes, during pregnancy, or in lactating bitches, has not been evaluated.

#### ADVERSE REACTIONS

In the field study, 161 dogs treated with SUROLAN were included in the safety database. Two dogs experienced reduced hearing at the end of treatment; on follow-up one dog had normal hearing capacity while the other case was lost for follow-up. The owner of another dog reported that on day 4 of treatment, build-up of the medication decreased the dog's hearing. At the end of treatment, this dog had normal hearing as assessed by the investigator. Residue build-up was reported in 1 dog and pain upon drug application in another dog.

For technical assistance or to report a suspected adverse drug reaction, contact Elanco Animal Health at 1-888-545-5973.

#### EFFECTIVENESS

Of 337 dogs enrolled in the field study, 176 dogs were included in the effectiveness database; 91 were treated with SUROLAN and 85 were treated with an FDA-approved active control. Clinical evaluations of otitis externa included pain/discomfort, swelling, redness, and exudate. A non-inferiority evaluation was used to compare SUROLAN with the active control with respect to each clinical sign of otitis externa and overall clinical improvement. SUROLAN was determined to be non-inferior to treatment with the active control for otitis externa. *Malassezia pachydermatis* and *Staphylococcus pseudintermedius* were identified pre-treatment in at least 10 cases that were clinically responsive to SUROLAN. SUROLAN was 96.7% effective in overall clinical improvement.

#### HOW SUPPLIED

SUROLAN is available in 15 mL and 30 mL plastic dispensing bottles with applicator tip for otic use.

#### STORAGE AND HANDLING

Store at or below 25 °C (77 °F).

NADA 141-298, Approved by FDA.

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