The experts says…

These are both good questions that are interrelated, but they need to be answered separately. Many unsubstantiated statements have been made on the consequences of periodontal disease, some of which could include the impression that dogs and cats without immaculately clean teeth are at greater risk for early death from cardiac or renal disease. There is no direct evidence of this and it seems counterintuitive, given that periodontal disease is more severe and more common in toy and small-breed dogs than in larger dogs and that small dogs live longer than larger dogs.¹

One way to approach these issues is through a series of questions and answers.

**IS INFECTION OF THE MOUTH COMMON?**

Yes: Infection (defined as a presence of infectious organisms and a host response) is common in the mouth.² An extraordinarily wide range of bacteria exists in oral fluid and on oral surfaces: This typically includes organisms associated with infections in other parts of the body, such as *Staphylococcus* or *Streptococcus* species, coliform bacteria, and *Pasteurella* species (particularly in cats), as well as mouth-specific anaerobic organisms and spirochetes.³ Because the bacterial flora in the mouth is so varied, how do you select the single causative organism when culture results reveal presence of several organisms with different susceptibility patterns?

---

³ Ask the Expert / NAVC Clinician's Brief / January 2012...............................................................................................................................................................................................13
The association between periodontal disease and distant-organ or systemic disease is not necessarily a cause-and-effect event.

Any attempt to identify the single organism causing a given oral infection in a clinical patient is a waste.

Oral tissues are bathed in salivary fluid, which is rich in antibacterial substances, and have a more abundant blood supply than does skin (another surface commonly coated with a rich flora). Although all dogs eventually develop localized periodontal disease as a consequence of poor oral hygiene, for many it does not progress beyond gingivitis or superficial or moderate periodontitis (eg, periodontal pocketing, gingival recession).

Why, then, do some dogs develop horrendous mouths? First, most have little or no natural daily teeth cleansing, as the standard convenience foods that most owners provide are nutritionally excellent but provide little effective chewing activity. Second, the body’s reaction to the presence of bacteria varies greatly.

**IS PERIODONTAL DISEASE ASSOCIATED WITH SYSTEMIC & DISTANT-ORGAN* ABNORMALITIES?**

Yes: There are proven associations between periodontal disease and systemic and distant-organ abnormalities. Two studies conducted in dogs demonstrated that microscopic inflammatory or degenerative changes in distant organs (kidney, liver, heart) increase with rising severity of periodontal disease, and 2 studies have demonstrated an association between periodontal disease and cardiac or renal disease, though the extent of periodontal disease in these studies was recorded inconsistently. Of course, the body has an adept ability to accommodate minor abnormalities, and the association between periodontal disease and distant-organ or systemic disease is not necessarily a cause-and-effect event.

Any injury (including infection) has a measurable effect on the entire body; typically, acute phase proteins (eg, C-reactive protein [C-RP], amyloid A) are used to measure this effect. In a study conducted at University of Pennsylvania and Cornell University, dogs with periodontal disease were treated as indicated, and their C-RP concentrations before and several weeks after the periodontal treatment were measured. Although the differences were moderate, C-RP concentration correlated with severity of periodontal disease and was reduced posttreatment. The latter finding is the first data-driven observation that mirrors what many owners report: Dogs often act younger following treatment of severe periodontal disease.

* I distinguish distant-organ (eg, renal or cardiac) abnormalities from systemic (eg, body-wide change) abnormalities.

ADA = American Dental Association, AHA = American Heart Association, C-RP = C-reactive protein
The evidence for a link between periodontal disease and infective endocarditis in dogs is mixed.\textsuperscript{10,13-16} The studies typically include too few dogs given the number of variables that may affect the result, or the scoring methods for the extent of oral disease are too subjective.

HOW DOES GOOD ORAL HEALTH AFFECT TREATMENT OF SYSTEMIC DISEASE?

Common sense and the evidence noted previously suggest that good oral health is beneficial in the treatment of systemic disease, although no published data have proved this for dogs or cats.

In humans, there is a clear association between diabetes and periodontal disease: People with diabetes are more likely to have periodontal disease, and diabetes is more labile in people with periodontal disease.\textsuperscript{18} Dental treatment (if indicated) and effective oral hygiene regimens are now standard parts of managing human diabetes. Because of the variables and additional challenges involved with the requirement for anesthesia for dental treatment in veterinary patients, a well-controlled study with a large enough number of subjects to investigate the periodontal disease–diabetes association in dogs will be difficult to conduct.

THE BOTTOM LINE

Obtaining optimal oral health is a challenge because clients may not understand the need to brush their pet’s teeth. Fortunately, oral hygiene can include more than brushing, though brushing remains the gold standard.\textsuperscript{17} The Veterinary Oral Health Council (www.VOHC.org) provides a list of products that have met the preset standards for slowing accumulation of plaque and calculus (ie, tartar); these products include dental diets, treats, water additives, gels, and toothpastes. The key is daily use, which is a lot easier if the owner can find a way to make daily oral hygiene a fun interaction.

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