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Small animal dentistry in Canada: 1994 survey

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Introduction

Small animal dentistry is a rapidly growing area of interest and specialization internationally, offering tremendous benefits to patients, clients, and practitioners. To date, no studies have been done to determine the standard of small animal dental care in Canada. A national mail survey was designed to document the prevalence of dental disease in small animal patients, the types of veterinary dental procedures being provided by practitioners, as well as home care recommendations and compliance for 1994.

Materials and methods

A list of all the small animal and mixed practices in Canada was obtained from the Canadian Veterinary Medical Association. This was cross-referenced against the provincial and territorial veterinary directories to create an updated database of 1128 small animal and 642 mixed practices throughout Canada. Based on the number of practices, targeted sample sizes were calculated using a 95% confidence level (1). Random numbers were then generated to select 300 mixed practices and 350 small animal practices from the database to be surveyed.

The survey covered the areas of prevalence of dental and oral diseases, basic professional dental procedures, home dental care recommendations and compliance, as well as advanced professional dental procedures. Veterinarians were asked to identify their province or territory and their practice type to determine if these made significant differences in veterinary dental practice. Names were not required, to guarantee confidentiality and to obtain the best possible response rate.

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A copy of this article in French is available from Dr. Haws upon request.

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The questions on prevalence of dental and oral disease were asked for the average number of small animal cases seen per week rather than per year, to provide a more reliable estimate by practitioners. Estimates of the percentages of canine and feline patients that required dental care immediately, within 3 to 6 mo, and within 12 mo, using categories of 20% increments from 0% to 100%, were also requested. The 20% increments were chosen to allow for reasonable estimates for each of the categories.

The questions on basic professional dental care covered the details of a complete dental prophylaxis. For each of the steps, practitioners were asked to indicate if the procedure was done, and if it was performed by a veterinarian, technician, or both.

A follow-up question surveyed the recommendations and compliance for complete dental prophylaxis, other periodontal therapy, endodontic therapy, restorative therapy, oral surgery, as well as orthodontics. In addition, the survey asked whether the procedures being recommended were done by a professional in the practice, or referred to another veterinarian.

The question on home care was divided into responses for dogs and cats. Questions were asked on the recommendation and compliance for daily toothbrushing, and the use of several categories of dental care products. Space was provided to record dental care products not listed, so that all products being recommended would be documented.

The last 2 pages of the survey were for practitioners performing more advanced procedures. Topics covered included radiography, periodontal therapy, endodontic therapy, restorative therapy, oral surgery, and orthodontics. Veterinarians were asked to indicate if they were doing various procedures for each of these disciplines. For the endodontic section, they were also asked to record the average number of dental radiographs taken for a standard root canal procedure.

The survey went through several modifications to reach its final form, which was then translated into French for practices in Québec. The surveys were mailed to all provinces and territories in Canada in the first week of January 1995. As each practice was sent only one survey, it was requested that in multi-person practices the veterinarian most interested in dentistry complete the survey.

A computer program (Epi Info, Version 6, Centers for Disease Control and Prevention, Atlanta, Georgia, USA) was used to compile and analyze the responses to the survey. A questionnaire template was made for the 1st and

Table 1. Cases per week for small animal and mixed practices

Cases	Small animal practice mean (s_x)	Mixed practice mean (s_x)
Total canine	60.7 (3.0)	42.1 (3.0)
Canine dental/oral	7.7 (0.9)	4.4 (0.5)
Total feline	54.2 (2.6)	32.9 (2.7)
Feline dental/oral	6.7 (0.6)	3.2 (0.5)

2nd parts of the survey, and data entry was done for each survey. The data from the 2 parts of the survey were then merged for analysis.

Each component of each question was defined as a unique variable. The percentage responses for the variables province or territory, as well as practice type, were compared to the actual percentages of practices by province or territory and by practice type. For the remaining variables, a mean with standard error was generated for numeric responses, and a frequency distribution was generated for non-numeric responses.

A *t*-test was done for each of these variables to determine if there was a significant difference in the response by practice type. Bartlett's test for homogeneity of variance was used to guide the solution of the *t*-test. If the data for the variable were normally distributed, the analysis of variance (ANOVA) test was used; if the data were not normally distributed, a non-parametric ANOVA (the Kruskal-Wallis) was used.

Finally, the general question covering the different disciplines of veterinary dentistry was analyzed. A chi-square test was done for each variable to determine if there was a significant association between the responses for each variable and the province or territory. All tests were conducted at a 95% confidence level, so that a *P*-value less than 0.05 was considered significant.

Results

Survey responses were received until late April 1995. There were 370 surveys returned, giving an overall response rate of 56.9%. The percentage of responses by province and territory was very close to the actual percentage of practices in each province or territory.

The mean numbers of canine and feline cases per week, as well as dental and oral cases per week, were larger for small animal practices than for mixed practices (see Table 1).

The most common response for the percentage of dogs and cats that required dental care was the same for both dogs and cats in each of the 3 categories: 0% to 20% required dental care immediately, 20% to 40% within 3 to 6 mo, and 20 to 40% within 1 y. There was no significant difference in the responses to this question for small animal versus mixed practices.

On the basis of the answers to the questions on complete dental prophylaxis, we concluded that the majority of all practices did not use a preoperative antibacterial rinse or sulcular irrigation. Twenty-three percent of all practices used an air-water syringe for sulcular irrigation. Removal of gross calculus, exploring and charting, supragingival scaling with an ultrasonic scaler and

hand instrumentation, subgingival scaling with curets, polishing, and fluoride treatment were done by the majority of all practices.

The majority of mixed practices did not treat with fluoride. Veterinary technicians performed supragingival scaling, subgingival scaling, and polishing more often than did veterinarians in small animal practices, but the opposite applied in mixed practices.

There were high percentages of positive responses to the questions regarding recommendations and compliance for complete dental prophylaxis and oral surgery. These were in contrast to the answers given for other periodontal surgery, endodontics, restorative dentistry, and orthodontics. Endodontics, restorative dentistry, and orthodontics were done more often through referral (see Table 2).

There was a statistically significant association between the responses to the questions on endodontic therapy and the province or territory. Practices from all provinces and territories reported recommending endodontics, with the single exception of Saskatchewan. Provinces with endodontic therapy performed by a veterinarian in the practice included Alberta, British Columbia, Manitoba, New Brunswick, Ontario, Prince Edward Island, and Québec.

In reply to questions on client and patient compliance with home dental care, the majority of practices indicated that they recommended daily toothbrushing for both canine and feline patients. However, there was a significantly larger percentage of small animal practices (71.1%) that made this recommendation for cats than did mixed practices (51.3%). The most common level of compliance for toothbrushing in all practices was 0% to 20%.

The majority of all practices recommended veterinary toothpastes and veterinary toothbrushes for use in both dogs and cats. A veterinary chlorhexidine oral rinse was recommended for use in dogs in the majority of all practices. The most common level of compliance for all veterinary dental products was 0% to 20%.

Fifty-six percent of all practices recommended feeding hard biscuits on a regular basis to dogs, with the most common rate of compliance being 80% to 100%. Feeding rawhide chew strips to dogs on a regular basis was recommended by 70.6% of all practices, with the most common level of compliance being 40% to 60%. Feeding a dry diet exclusively was recommended by 79.6% and 57.0% of both small animal and mixed practices for canine and feline patients, respectively. The most common level of compliance was 60% to 80%.

Feeding a canine prescription diet for plaque and calculus reduction was recommended by 50% of all practices. Due to the large percentage of veterinarians who were unsure of the compliance with this new product, compliance percentages were unreliable. Less than half of all practices recommended the use of a zinc ascorbate oral gel or spray, a veterinary chlorhexidine gel, or human soft toothbrushes. Numerous other dental care products were recorded in the responses to the survey, but no single product was recommended by more than 5% of the respondents.

Two hundred and eighty-four of 370 practices responded to the 2nd part of the survey on advanced professional dental procedures. Of these, 37.0% reported doing intra-oral dental radiography. Dental radiographs were reported

Table 2. Percentage recommendations, compliance, and procedures for all dental disciplines performed by veterinarians in-house or on referral

Procedure	Percentage			
	Recommended	Compliance	In-house	Referral
Complete dental prophylaxis	94.8	40-60	99.2	0.8
Other periodontal therapy	63.6	40-60	54.8	7.1
Endodontic therapy	40.5	0-20	15.3	27.9
Restorative therapy	30.4	0-20	13.4	18.1
Oral surgery	66.3	80-100	57.0	11.5
Orthodontics	11.5	0-20	9.0	16.4

to be used to diagnose and treat periodontal disease in 32.7% of these practices. Root planing and subgingival curettage, periodontal surgery for pocket reduction, increasing the zone of attached gingiva, and osseous contouring were done in 52.1%, 31.0%, 14.4% and 7.4% of these practices, respectively.

Fewer than 20% of these practices reported doing endodontic and restorative procedures. For standard root canal procedures, the mean with standard error for the number of radiographs taken was 3.3 (s_x 0.3). Intraoral radiography was used in 14.1% of these practices to grade feline resorptive lesions prior to restoration, and 18.0% of these practices reported restoring these lesions. A fluoride varnish, chemically cured glass ionomer, and a light cured glass ionomer were used as the final restorative for feline resorptive lesions by 13.0%, 12.0% and 4.9% of these practices, respectively.

Fewer than 2.0% of these practices reported using crowns. The most common crown material used was a gold alloy.

Preoperative radiographs were taken for extractions in 37.0% of these practices, while a smaller percentage (19.4%) reported taking postoperative dental radiographs. The majority of practices performed extractions of deciduous teeth (93.0%), extractions for advanced periodontal and endodontic disease using mucoperiosteal flaps (54.9%), repair of oronasal fistulas (59.2%), and repair of maxillary and mandibular fractures and dislocations (80.3%).

The most common orthodontic procedures done were interceptive orthodontics and incline planes for correction of base narrow canines in dogs. Orthodontic correction of genetic malocclusions in breeding animals was done by 4.6% of these practices before neutering, and by 8.8% after neutering.

Discussion

The survey was truly representative of the whole of Canada, and the response rate of 56.9% was excellent. The larger weekly general and dental caseloads in small animal practices compared with mixed practices was not unexpected. A high prevalence of small animal dental and oral disease was seen in all practices (10% to 12% of the general caseloads). Canine patients were seen in larger numbers than feline patients, a reflection of a larger number of dogs in the general caseloads.

The clinical judgment of most veterinarians was that the need for immediate dental care was less frequent than

the requirement for care within 3 to 12 mo. In a 1980 anecdotal in-hospital survey done by an American Veterinary Dental College member in Fairfax, Virginia, USA, the results were 43% of patients requiring dental care immediately, 42% within 3 mo, and 15% within 12 mo or later (Williams CA, personal communication). As the Canadian veterinary profession becomes more knowledgeable about oral and dental pathology, we expect that there will be a shift towards recommending more immediate dental care.

Most practices would improve their dental care by including a preoperative antibacterial rinse to reduce aerosolized bacteria (2), and using sulcular irrigation to flush polishing paste and debris loosened by curettage. This should be done either with a periodontal or endodontic needle attached to a syringe or a water jet device (Water Pik, Teledyne Water Pik Canada, Scarborough, Ontario). The air-water syringe should not be used for sulcular irrigation, as pressurized water can cause particles to become embedded in the inflamed tissue rather than being flushed from the sulcus (3). Most mixed practices would also benefit by applying a topical fluoride product at the end of a complete dental prophylaxis to help desensitize exposed dentinal surfaces and for the prevention of caries (4).

The greater use of veterinary technicians in doing complete dental prophylaxis in small animal versus mixed practices may be a reflection of the larger small animal caseload, as well as more extensive dental training for technicians in small animal practices.

The low compliance rate of all practices for all procedures other than complete dental prophylaxis and oral surgery may reflect the higher costs of the more advanced procedures. Additionally, as a profession, we are not well versed in the debilitation and pain that results from oral and dental pathology.

Practitioners are doing well in recommending daily toothbrushing. The higher rate of recommendation for felines seen in the responses from small animal practices could be explained because a few feline practices were surveyed as part of the small animal group. The high rate of recommendations for veterinary toothpastes, toothbrushes, and a veterinary chlorhexidine oral rinse demonstrates that the veterinary profession has been educated on the benefits of these products. The low level of compliance of 0% to 20% for toothbrushing and using all veterinary dental products is not unlike the results of studies in human dentistry (5). A recent survey in veterinary dentistry reported 53% compliance with toothbrushing

in dogs, but those surveyed were a small group of highly motivated clients who had dental care for their dogs done at a veterinary teaching hospital (6).

Practitioners are also doing well in recommending the exclusive feeding of a dry food, as well as the feeding of hard biscuits and rawhide chew strips to dogs. The exclusive feeding of a dry food to cats would also help to prevent periodontal disease (3).

The percentage of practices that reported doing intra-oral dental radiography was encouraging, as intraoral dental radiography is an absolute requirement for doing advanced dental procedures. Ideally, the average number of dental radiographs taken for a standard root canal procedure is 4, with the 1st to evaluate pathology, the 2nd to determine if the file is within 1.0 mm of the apex, the 3rd to evaluate if the mastercone is within 1.0 mm of the apex, and the 4th to assess if the obturation is complete.

A few practices reported restoring feline resorptive lesions without first radiographing the lesion. We strongly advise against restoring resorptive lesions in cats without first determining if there is near pulpal exposure or pulpal exposure on radiography. Long-term studies have shown that a low percentage of these restored teeth are retained, even when they are first evaluated radiographically to determine that there is no pulpal exposure (7).

The large percentage of practices across Canada performing oral surgical procedures in contrast to other procedures is a reflection of the emphasis in veterinary education until recently. For the less often performed orthodontic procedures, we feel it is ethical to neuter a breeding animal with a genetic malocclusion prior to treatment, unless the patient is too young to be neutered.

All animals deserve a pain-free, functional occlusion, but not necessarily a perfect one.

In conclusion, a high prevalence of small animal dental and oral disease was reported in small animal and mixed practices (10% to 12% of the general caseloads). There were specific areas where improvements can be made in small animal dental procedures, as well as home care recommendations and compliance. However, Canadian veterinarians are doing well with several areas of small animal dental practice and home care. This survey serves as a reference point for future advancements in small animal dentistry in Canada.

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