Effect of veterinarian-client-patient interactions on client adherence to dentistry and surgery recommendations in companion-animal practice

Noureen Kanji, BSc, MSc; Jason B. Coe, DVM, PhD; Cindy L. Adams, MSW, PhD; Jane R. Shaw, DVM, PhD

Objective—To explore the relationship between veterinarian-client-patient interactions and client adherence to dental and surgery recommendations and to test the a priori hypotheses that appointment-specific client satisfaction and relationship-centered care are positively associated with client adherence.

Design—Cross-sectional study.

Sample—A subsample of 19 companion-animal veterinarians and 83 clients from a larger observational study consisting of 20 randomly recruited veterinarians and a convenience sample of 350 clients from eastern Ontario.

Procedures—Videotaped veterinarian-client-patient interactions containing a dentistry recommendation, surgery recommendation, or both were selected for inclusion from the larger sample of interactions coded with the Roter interaction analysis system. Client adherence was measured by evaluating each patient’s medical record approximately 6 months after the videotaped interaction. The clarity of the recommendation, appointment-specific client-satisfaction score, and relationship-centered care score were compared between adhering and nonadhering clients.

Results—Among the 83 veterinarian-client-patient interactions, 25 (30%) clients adhered to a dentistry recommendation, surgery recommendation, or both. The odds for adherence were 7 times as great for clients who received a clear recommendation, compared with clients who received an ambiguous recommendation from their veterinarian. Moreover, adhering clients were significantly more satisfied as measured after the interview. Interactions resulting in client adherence also had higher scores for relationship-centered care than did interactions leading to nonadherence.

Conclusions and Clinical Relevance—Veterinarian use of a relationship-centered care approach, characterized as a collaborative partnership between a veterinarian and a client with provision of clear recommendations and effective communication of the rationale for the recommendations, has positive implications for client adherence. (J Am Vet Med Assoc 2012;240:427–436)

Relationship-centered veterinary care is a collaborative veterinarian-client-patient partnership in which there is mutual understanding and recognition of the client’s perspectives and expertise in the pet’s care through shared negotiations and balance of power.1 This communication model is recognized as an important framework for an ideal health-care system because it identifies the nature of relationships as a fundamental component of the successful delivery of high-quality health care.2 Adherence has been described as an outcome that arises from a collaborative and mutual relationship with the health professional and implies that clients make intentional choices concerning treatment regimens on the basis of the diagnosis and their beliefs about the illness and the accompanying treatment options.3,4

Research in veterinary medicine on client adherence and its determinants in companion-animal practice is limited. In contrast, human-medical researchers have developed a wealth of knowledge and evidence regarding the physician-patient relationship to understand the roles that physicians and patients play during their interactions and the impact of these relationships on important medical outcomes, including patient adherence,5–11 patient and physician satisfaction,12–15 and patient health.16–18 Only recently has the role of the veterinarian-client-patient interaction become a focus in relation to client adherence in veterinary medicine.
Ineffective communication has been found to produce a lack of client understanding or belief in the importance of the veterinarian’s recommendation. Although several studies have recently been conducted to develop a better understanding of veterinarian-client-patient interaction in veterinary practice, much of the research to date has been primarily descriptive in nature, with little investigation into the impact of veterinarian-client-patient interactions on the outcomes of care.

The primary focus of the limited adherence research in veterinary medicine has been on short-term antimicrobial treatment in dogs, with recent research on adherence expanding to include other areas of veterinary care such as vaccinations, heartworm medications, dental procedures, and medical diets. The overall purpose of the study reported here was to explore the relationship between veterinarian-client-patient interactions and client adherence specific to dental and surgical procedures and to test the a priori hypotheses that adhering clients have greater appointment-specific satisfaction than nonadhering clients and that RCC is positively associated with client adherence. Research in human medicine has shown patient satisfaction to be an important outcome of physician-patient interactions and to be correlated with patient adherence. Furthermore, the human medical literature advocates that RCC interventions promote higher patient satisfaction, which in turn contributes to improved patient adherence.

Materials and Methods

This study was conducted from March to October 2006. The study protocol was reviewed and cleared by the University of Guelph Research Ethics Board and the Institutional Review Board of the Johns Hopkins Bloomberg School of Public Health. Full details of the study protocol have been previously published.

Study population—In brief, the target population from which veterinarians were recruited consisted of companion-animal practitioners from 14 counties across eastern Ontario, Canada. All veterinarians in this geographic area were identified by use of the College of Veterinarians of Ontario database, which includes all licensed veterinarians in the province. A randomized list of all veterinarians practicing ≥ 50% of their time in companion-animal practice was compiled. Veterinarians were contacted in sequence through an initial letter of introduction, followed by telephone recruitment until 20 had agreed to participate in the study. Because individual veterinarians were selected, it was possible to have multiple veterinarians from a single practice participate in the study.

For veterinarians agreeing to participate in the study, 2 initial study visits were scheduled to begin data collection. As part of the consent process, veterinarians were informed that the purpose of the study was to describe veterinarian-client-patient interactions in companion-animal practice and to examine the impact of these interactions on the outcomes of veterinary care. Each veterinarian’s written, informed consent was obtained at the onset of the first study visit.

Written, informed consent was obtained from all clients, including permission for audio-video recording of the appointment, completion of a short demographic survey, a postinteraction appointment-specific CSQ, a 2-week follow-up telephone interview, and authorization to review the patient’s medical record within 1 year after the original study visit. Clients were recruited in each clinic when data were being collected for the participating veterinarian. For compassionate reasons, appointments scheduled for a planned euthanasia were excluded from the study.

Data collection—A minimum of 14 veterinarian-client-patient interactions were videotaped/veterinarian. A video camera was strategically mounted in a corner on the ceiling of the examination room designated for participating clients. The camera was turned on prior to the first appointment and ran continuously for the duration of each study visit to minimize the chances of losing critical data. A short demographic survey was completed once by each participating veterinarian and client. An exit questionnaire designed to evaluate the impact of videotaped tapes was administered to participating veterinarians at the end of each study day.

Measuring client adherence to medical recommendations was attempted by use of 2 methods. The first, self-reporting, involved telephoning participating clients approximately 2 weeks after their visit to assess their adherence. The second involved reviewing each patient’s medical record approximately 6 months after their visit to document adherence. This process involved accessing the medical record for each patient evaluated during the initial study visits at the practice employing each participating veterinarian. The medical records were reviewed; the adherence data were documented on-site by one of the authors (JBC). Each patient’s medical record was thoroughly examined from the date of the original study visit to the time of the medical record review for written documentation that a dental or surgical procedure had been performed.

RIAS coding of videotaped interactions—The RIAS is a framework that has been used extensively in human medicine to study physician-patient interactions by dividing talk into discrete communication variables. Subsequently, the RIAS has been adapted to veterinary medicine. All interactions captured by audio-video recording during the study visits were analyzed by use of the RIAS. Trained coders evaluated both verbal and nonverbal communication used during the veterinarian-client-patient interactions. Verbal communication was broken down into individual utterances and coded into 1 of 48 mutually exclusive communication variables. An utterance is defined as the smallest discriminable speech segment (statement) to which classification may be assigned. The present study assessed veterinarian-client-patient communication in the following 3 directions: veterinarian to client, client to veterinarian, and veterinarian to pet. For interactions involving ≥ 2 clients, all client talk was combined.

Identification of dentistry and surgery recommendations—From the RIAS-coded interactions, visits containing a dentistry recommendation,
surgery recommendation, or both were identified. First, 2 proficiency codes were added to the RIAS coding framework to capture the presence of discussion related to dental care (first proficiency code) or surgical procedures (second proficiency code). Proficiency codes are distinct markers made in the coding of a visit that designate the occurrence of a predefined type of communication.

Next, all video-recorded interactions containing dentistry discussion, surgery discussion, or both were subsequently reviewed from the beginning by the principal author (NK) to identify more specifically visits where a dentistry recommendation, surgery recommendation, or both were made. A dentistry recommendation was defined as any proposal requiring the animal to undergo anesthesia for a procedure to improve the condition or prevent further wound, injury, or disease to the animal’s mouth, including teeth and soft tissue. A surgery recommendation was defined as requiring the animal to undergo an invasive operative procedure under anesthesia where normal anatomy is substantially altered through the incision of skin or mucous membranes with connective tissue or where a body cavity is invaded. In addition, the type of surgical procedure was assigned to 1 of 4 categories: spay or neuter, lump removal, luxating patella, and other types of surgeries.

**Coding clear versus ambiguous recommendations**—Each identified recommendation was coded by the principal author (NK) as either clear or ambiguous. A clear recommendation was defined as one in which the veterinarian clearly proposed a need for a dental or surgical procedure to the client. For example, “Given the hard tartar and plaque build-up, I recommend we do a dentistry [procedure], to scale it off and prevent further gingivitis and gum recession” or “Unfortunately, the only sure thing to do is surgery.” An ambiguous recommendation was defined as one in which the veterinarian suggestively promoted a dental or surgical procedure in the form of an insinuation or vague proposition. This included occasions on which a number of alternatives were presented but no definitive medical recommendation was made, thus introducing a source of uncertainty. The following examples of ambiguous recommendations were not followed by any other clear recommendations: “We could drain it again and see what happens, or the other way to deal with a cyst would be to have an epideral under anesthetic and actually make an incision to take it out” and “Looking at her teeth, it wouldn’t hurt to consider a dental [procedure] in the near future.”

**Measuring appointment-specific client satisfaction**—Appointment-specific client satisfaction was measured by use of the 15-item CSQ immediately administered following each veterinarian-client-patient interaction. The response format used a positively skewed, 6-point adjectival scale (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent, and 6 = could not be better). The cumulative mean of all 15 satisfaction items making up the CSQ was calculated to produce an overall satisfaction score for each interaction. The CSQ has been validated previously within the population of the present study.

**Measuring RCC**—The RCC score was calculated as a proportion of client-centered talk to veterinarian-centered talk, reflecting the balance of dialogue within an appointment. Client-centered talk is the sum of veterinarian and client information gathering and information giving regarding lifestyle or social matters (ie, discussion of the pet’s daily activities and social interactions with humans and other animals), activation and partnership by the veterinarian, veterinarian rapport building, and gathering of biomedical information (ie, discussion relating to the medical condition, diagnosis, treatment, or prognosis) by the client. Veterinarian-centered discussion comprises the sum of veterinarian information gathering and information giving with respect to biomedical topics, veterinarian orientation, and client biomedical information giving.

A high RCC score represented visits with a greater indication of client centeredness, in which dialogue regarding lifestyle and social topics, activation and partnership, and rapport building, and opportunity for the client to ask questions were evident. Conversely, visits corresponding to a low RCC score indicated a greater emphasis on the veterinarian agenda, in which veterinarians sought out biomedical data and clients primarily provided biomedical information in return.

**Assessing the emotional tone during each study visit**—During the initial coding of the veterinarian-client-patient interactions, the RIAS coders assigned global affect ratings to both the veterinarian and client by use of a rating scale of 1 (low) to 5 (high), capturing a number of positive (eg, interested and attentive, friendly and warm, responsive and engaged, sympathetic and empathetic, and respectful) and negative (eg, angry and irritated, anxious and nervous, depressed and sad, emotionally distressed and upset, dominant and assertive, and hurried and rushed) visit-level emotional tones. Emotional tones are assigned by the RIAS coders on the basis of their overall affective impressions of the veterinarian and client and are related to vocal qualities rather than literal content. In the present study, 10 emotional tone ratings for veterinarians and 12 emotional tone ratings for clients were assessed. Because of the lack of distribution in data across each emotional tone category, each variable was dichotomized on the basis of frequency count to report a low and a high score.

**Statistical analysis**—Demographic variables were compared between the 20 respondent and 13 nonrespondent veterinarians. Contingency table analyses were used for all discrete variables (gender; associate vs practice owner or partner; full-time vs part-time employment; urban, suburban, or rural practice location; and number of veterinarians employed by the practice) with P values calculated on the basis of the Fisher exact test. The Kolmogorov-Smirnov test was used to determine whether continuous variables were normally distributed. The independent t test was used to compare years of clinical experience between groups, and because data were not normally distributed, the Wilcoxon-Mann-Whitney test was used to compare base cost of a regular office visit between groups.

Further analysis was primarily conducted at the appointment level (eg, CSQ scores, RCC scores, and appointment duration) and occasionally at the veterinarian and client level (eg, emotional tone ratings). Dentistry and surgery recommendations were combined...
to increase the power of the study. Descriptive statistics (mean ± SD, median, and range) were calculated. A Fisher exact test was used to test the significance of clear versus ambiguous recommendations on client adherence. Appointment-specific CSQ score, RCC score, and appointment duration for visits were tested for normality by use of the Shapiro-Wilk test statistic. The Wilcoxon-Mann-Whitney exact test, with the exact permutation distribution, was used to compare median overall CSQ score, RCC score, and duration of appointment with client adherence and nonadherence. The Pearson χ² exact test, with the exact permutation distribution, was used to compare differences between high and low scores of veterinarian and client emotional tone ratings for appointments of clients who adhered to a dentistry recommendation, surgery recommendation, or both and those who did not. Spearman correlations were tested between similar veterinarian and client emotional tones when both were found to be significant. On a random subset of approximately 50% of the audio-video recordings, intrarater agreement was assessed for the coding of clear and ambiguous recommendations. The audio-video recordings were recoded by the principal author (NK) approximately 6 months following the initial coding, and the Cohen κ test was used to test agreement.

Twenty-one client-, pet-, veterinarian-, practice-, and appointment-related demographic variables (Appendix 1) along with 30 RIAS-coded communication composites capturing all 3 directions of veterinarian and client discussion (Appendix 2) were tested as potential determinants of client adherence to a dentistry recommendation, surgery recommendation, or both. The communication composites were composed of like variables from the 48 RIAS communication variables. Because of the multilevel structure of the data set, random effects were explored. In the end, binary logistic regression was used to avoid overfitting the data, considering that the data contained similar numbers of veterinarian participants (n = 19) and positive responses of adherence (25).

Using descriptive statistics, a cutoff was chosen on the basis of frequency count to dichotomize 1 RIAS-coded communication composite (ie, client-to-veterinarian activation and partnership). This newly categorized variable classified clients as offering either no activation and partnership or some activation and partnership statements to their veterinarian. The purpose of this grouping was to compensate for the small distribution of data. Univariate analyses were performed initially to screen all potential determinants for an association with client adherence to a dentistry recommendation, surgery recommendation, or both. All predictor variables (Appendices 1 and 2) for which the P value in univariate analyses was < 0.20 were retained.

Because of the limited size of the data set, initially all retained variables (P < 0.20) were divided on the basis of demographic variables and RIAS-coded communication composites and modeled separately without interaction terms. Backward elimination techniques were used for model building. In addition, an alternative model-building process was used in which all retained variables were also incorporated into a series of 2-term subset models, including the interaction. Because of the limited size of the data set, each model was restricted to a maximum of 5 df. Linearity was assessed for all continuous variables prior to testing the interaction models by use of graphic methods and by adding squared terms (quadratics). Backward elimination techniques were used.

All analyses were performed with standard software. Values of P ≤ 0.05 were considered significant.

Results

The follow-up telephone interview, conducted 2 weeks after the initial visit, was deemed unsuccessful at determining client adherence to a dentistry recommendation, surgery recommendation, or both. A number of clients had not reached the point at which their adherence could be measured, given that sufficient time had not elapsed since the initial study visit. On the other hand, dentistry and surgery recommendations could be consistently identified for client adherence or nonadherence by documentation in each patient's medical record. As a result, this was used as the sole method of measuring client adherence for the present study.

Study—The study involved 20 veterinarians, with a response rate of 60.6% (20/33). The 20 veterinarians represented 19 veterinary practices. Demographic information was obtained from all 13 veterinarians who declined to participate. The primary reason given for not participating was discomfort with having client interactions videotaped. In 3 instances, associate veterinarians who initially agreed to participate subsequently declined because they were unable to secure permission from their employers. In all 3 instances, the employer expressed concern about the potential disruption the study might have on the practice. Participants and nonparticipants did not differ significantly with regard to any of the demographic variables examined.

Medical record data were not available for 1 of the 20 veterinarians recruited; therefore, only 19 of the 33 (58%) veterinarians initially contacted to participate were included in analyses. The actual duration of time between the initial videotaped interactions and the completion of the medical record reviews ranged from 5.5 to 8 months (median, 6 months). Among the participants, females represented a majority of the veterinarians included (14/19 [74%]). The mean time in practice for the participating veterinarians was 13 years (range, 2 to 25 years). Eighteen of the 19 (95%) veterinarians practiced in clinics where ≥ 2 practitioners were employed. In 1 instance, 2 veterinarians from the same practice participated in the study; however, they did not encounter the same client during the study. Of the 18 veterinary clinics within eastern Ontario, 9 were located in urban areas, 5 in suburban areas, and 4 in rural areas.

Overall, 350 of 366 (96%) clients consented to participate in the research project; however, as a result of loss of battery power to the video camera, termination of videotape recording for compassionate reasons, admittance of client participants to an examination room without the mounted video camera, and the unavailability of medical record
data for 1 veterinarian, 316 of the 350 (90%) consenting clients contributed data for this investigation. Based on the process used to identify dentistry and surgery recommendations, 83 videotaped interactions were ultimately included in the analyses of the present study.

Of these 83 interactions, 64 (77%) were female. The mean age of clients was 47 years (range, 22 to 78 years). Eleven (13%) clients had a household income ≤ $35,000, 18 (22%) had an income between $36,000 and $60,000, 22 (26.5%) had an income between $61,000 and $100,000, and 22 (26.5%) had an income > $100,000 (Canadian dollars). Annual household income was not provided for 10 (12%) clients. In addition, 52 of 83 (63%) clients had completed a college or university degree. Among the pet population, 31 (61.4%) visits involved appointments with only dogs, 31 (37.3%) with only cats, and 1 (1.2%) with a guinea pig. All 83 visits involved a single species of pet. As well, 8 of 83 (10%) visits were first-time interactions between clients and veterinarians.

Frequency of dentistry and surgery discussions—Of the 83 analyzed study interactions relating to a dentistry recommendation, surgery recommendation, or both, 49 (59%) visits contained discussion associated with a surgery recommendation, 33 (40%) consisted of discussion regarding a dentistry recommendation, and 1 (1%) included discussion of both a dentistry and a surgery recommendation.

Regarding surgical procedures, 28 of the 49 (57%) appointments dealt with talk related to spaying or neutering, 6 (12%) consisted of talk regarding lump removal, 4 (8%) involved the repair of luxating patella (dogs), and 11 (23%) involved other types of surgical procedures, each occurring once (eg, reducing hernia, surgical exploration, and caesarean section). The appointment dealing with both a dental and a surgical procedure consisted of discussion related to a dental cleaning as well as a lump removal.

Effect of clear versus ambiguous recommendations on client adherence—Overall, 25 of 83 (30%) clients adhered to veterinarian recommendations. Fifty-two of the 83 (63%) interactions consisted of a clear recommendation by the veterinarian regarding a dental or surgical procedure, whereas 31 (37%) were coded as ambiguous recommendations. From the 25 positive outcomes of client adherence detected in the study, most adhering clients (n = 22 [88%]) were provided with a clear recommendation, whereas 3 (12%) adhering clients were provided with an ambiguous recommendation. A significant difference was found between the clarity of recommendation given by the veterinarian (ie, clear or ambiguous) and client adherence to the procedure recommendation. In particular, the odds of a client adhering to a dentistry recommendation, surgery recommendation, or both when provided with a clear recommendation was 7 times as great as when clients were provided with an ambiguous recommendation (P = 0.001; 95% confidence interval, 1.8 to 25.4).

The κ test results for the recoding of 42 of the 83 (51%) visits containing a clear or ambiguous recommendation revealed high intrarater agreement (κ = 1), demonstrating the overall probability of random agreement by chance between author assessments to be small.

Effect of appointment-specific client satisfaction on client adherence—Overall, CSQ scores for the 83 veterinarian-client-patient interactions ranged from 3.0 to 6.0 (mean ± SD, 5.2 ± 0.7; median, 5.1). Adhering clients (median CSQ score, 5.8) were found to be significantly (P = 0.023) more satisfied with the veterinarian following the interaction than were nonadhering clients (median CSQ score, 3.0).

Effect of RCC score on client adherence—The RCC score ranged from 0.3 to 2.6 (mean ± SD, 1.0 ± 0.5; median, 0.8). Similar to CSQ score, the RCC score was significantly (P = 0.048) higher for adhering clients (median, 1.0) than for nonadhering clients (median, 0.8).

Effects of visit-level emotional tone on client adherence—For veterinarians, high sympathetic and empathetic tone (P = 0.004) and low hurried and rushed tone (P = 0.012) were found among visits where clients subsequently adhered to the recommendation. Likewise for clients, high sympathetic and empathetic tone (P = 0.027) and low hurried and rushed tone (P = 0.012) were found among appointments where clients subsequently adhered to the recommendation. Correlation analysis performed between the veterinarian and client sympathetic and empathetic tones detected no significant (P = 0.138) collinearity (P = 0.16), indicating 2 independent variables. Conversely, a significant (P < 0.001) correlation (ρ = 0.81) was found between the veterinarian and
client hurried and rushed tone ratings. Appointment duration was also found to be significantly (P = 0.033) longer where there was subsequent adherence to a dentistry recommendation, surgery recommendation, or both (median, 18 minutes) than where clients did not adhere to a dentistry recommendation, surgery recommendation, or both (median, 14 minutes).

Factors associated with client adherence to a dentistry recommendation, surgery recommendation, or both—Few specific demographic- or communication-related variables were found to be significantly associated with client adherence to a dentistry recommendation, surgery recommendation, or both. Exploration of a possible random component was not suggestive, which is consistent with findings from the same study population when used to study the outcome of appointment-specific client satisfaction. In that study, it was found that only 7.5% of the variation in appointment-specific client satisfaction was at the veterinarian level, with the remainder of the variation explained at the visit level.

As a result of the univariate analyses, 12 variables (6 demographic variables and 6 RIAS-coded communication composites) with a value of P < 0.20 were retained for modeling. The 6 retained demographic variables were related to the client (pet primary caregiver and relationship with pet), veterinarian (years of clinical practice, practice (scheduled appointment duration), and appointment (verbal dominance score and measured duration of appointment). The 6 retained RIAS-coded communication composites were relationship building (client-to-veterinarian and veterinarian-to-client positive talk), activation and partnership (client to veterinarian, veterinarian to client, and veterinarian to pet), and orientation (veterinarian to pet). The initial model-building process, not involving interaction terms, resulted in a single model containing the variable representing veterinarian-to-client positive rapport-building statements (P = 0.04; coefficient, 0.032; 95% confidence interval, 0.001 to 0.063). Furthermore, the alternative model-building process produced a single model, again containing the RIAS-coded communication variable representing veterinarian-to-client positive rapport-building statements (P < 0.01; coefficient, 0.265; 95% confidence interval, 0.076 to 0.455) and its squared term (P = 0.02; coefficient, −0.003; 95% confidence interval, −0.006 to 0.001). Graphically, this model demonstrated that the probability of client adherence to a dentistry recommendation, surgery recommendation, or both initially was higher with veterinarian use of positive statements directed toward the client; however, once a threshold of positive statements (n = 45) was surpassed, the probability of client adherence began to decrease.

Discussion

In the present study, the association between veterinarian-client-patient interactions and client adherence was explored. Relationship-centered care, client satisfaction, clarity of recommendation, appointment duration, and certain visit-level emotional tones were found to differ among appointments where clients subsequently adhered to a dentistry recommendation, surgery recommendation, or both versus appointments where clients did not adhere.

Overall, the present study found client adherence to dentistry and surgery recommendations to be poor (30%). Nonetheless, in the present study, when clients were given a clear recommendation, they were 7 times as likely to follow through with the dental procedure, surgical procedure, or both. This suggests that when an explicit recommendation is put forward by the veterinarian, it has positive connotations for client adherence. In light of the positive association that was also found between RCC and client adherence in the present study, it is important to emphasize that this finding does not imply that veterinarians should simply use a paternalistic, expert-in-charge approach to making medical recommendations. Rather, making clients aware of the options available is a required element of informed owner consent.

Studies have shown that most pet owners expect to be provided all options regarding their pet's health care. In addition to providing clients with all available options, findings in the present study address an inherent responsibility of veterinarians to clearly communicate to clients the best medically based recommendation for the pet from the available alternatives on the basis of the veterinarian's current understanding of the animal's condition, standards of care, and evidence-based medicine.

Moreover, results of a recent study indicate that client perception of a recommendation's value is based on how well the veterinarian explains the rationale for the recommendation. The study found that 30% of clients had not followed through with a recommendation by their veterinarian because they felt it was not necessary. Therefore, it is also important for practitioners to ensure that clients understand the rationale for each option and the recommendation. Research has shown that veterinarians and clients have different perceptions of value.

Veterinarians tend to focus on the time, service, and expertise they provide their clients, whereas pet owners focus on the benefit of these services to their pet's health and well-being. For each of the options, it is important for the veterinarian to convey the value to the client in a manner that addresses the benefits to the overall health and well-being of the animal.

Results of the present study support the a priori hypothesis that client satisfaction contributes to greater client adherence to medical advice in veterinary medicine. Satisfaction reflects meeting the expectations of the client, communicating effectively, and building strong veterinarian-client-patient relationships.

In an effort to reinforce client satisfaction and promote greater client adherence in practice, veterinarians are encouraged to explore the client's perspective, including their specific expectations in relation to their pet's care. Potential questions to elicit client perspectives may include, for example, “What do you hope to achieve today?” “What are your thoughts on how we can tackle this problem?” or “What questions or concerns do you have regarding the procedure I just outlined?” The information gathered through such questioning positions the veterinarian to relay the importance of his or her recommendation in a manner that aligns with the ex-
pectations and needs of the client and in turn promote greater client adherence.

Additionally, the present study also confirmed the a priori hypothesis that RCC leads to greater client adherence to recommendations. An RCC approach represents a cooperative endeavor between the veterinarian and client, provides opportunities for the sharing of critical information through open communication and collaboration, and ensures that the client’s concerns, ideas, and expectations are thoroughly explored and appreciated. This mutual endeavor allows clients to participate in making key decisions regarding their pet’s health. A 2006 study identifying communication patterns used during clinical appointments in companion-animal practice described the use of an RCC approach in 42% of the appointment visits studied. Thus, to shift the balance of power toward greater client involvement and in turn encourage higher rates of client adherence, veterinarians may find it beneficial to enhance communication skills that are in agreement with the RCC model. This may include providing information in small portions and verifying understanding with the client by the range of treatment options, discussing possible consequences and verifying understanding with the client on the possible interventions. This may include providing information in small portions and verifying understanding with the client on the possible interventions.

In addition to these findings, when appointment visits led to client adherence, veterinarians and clients were independently rated by RIAS coders as being more sympathetic and empathetic than when appointment visits led to client nonadherence. Roughly 80% of all communication between individuals has been identified to be nonverbal. Empathy is 1 such skill that is central to the development of the veterinarian-client-patient relationship. It can be directly communicated through body language such as posture, eye contact, facial expressions, and body movements and does not always require the expression of verbal communication. Veterinarian nonverbal communication skills such as soft tone of voice, use of touch, and caring facial expressions demonstrate empathy. By expressing attentiveness and sensitive appreciation for client preferences and concerns through nonverbal support, client adherence may be improved.

Both veterinarians and clients in the present study were perceived by the RIAS coders to be less hurried or rushed during appointment visits leading to client adherence than in appointments leading to client nonadherence. In addition, appointment duration was also found to be longer for interactions leading to client adherence than in dentistry and surgery discussions within different regions. Further, not all veterinarians approached to participate in the present study agreed. Although demographic differences between participants and nonparticipants were not found, it is interesting to note that in the present study, the use of positive relationship-building statements by veterinary practitioners toward clients initially had a positive association with client adherence; however, once a threshold of positive statements was reached, additional statements were observed to have an opposite effect on client adherence. Veterinarians should be encouraged to use positive rapport-building statements with clients but remain conscious that there may be a limit to the positive effects of this form of exchange.

In keeping with recommendations for measuring adherence, two approaches were initially used in the present study. Reviewing patient medical records proved to be a more valid measure of client’s adherence to dentistry and surgery recommendations because Ontario licensure regulations clearly define medical record requirements for companion animals, making it a legislative obligation for practitioners to record procedures requiring anesthetics (eg, dentistry and surgery) including detailed documentation of the procedure. Notwithstanding, it is still possible clients involved in the present study pursued the services of another veterinarian to perform the dentistry procedure, surgical procedure, or both that would not have been captured by this measure of adherence. To move adherence research forward, continued efforts to develop reliable and valid measures of adherence are important.

The present study included a small sample size of practitioners and their clients from a small region of eastern Ontario, and there may be disparities in the frequency and nature of dentistry and surgery discussions within different regions. Further, not all veterinarians approached to participate in the present study agreed. Although demographic differences between participants and nonparticipants were not found, it is important to note that in the present study, the use of positive relationship-building statements by veterinary practitioners toward clients initially had a positive association with client adherence; however, once a threshold of positive statements was reached, additional statements were observed to have an opposite effect on client adherence. Veterinarians should be encouraged to use positive rapport-building statements with clients but remain conscious that there may be a limit to the positive effects of this form of exchange.
possible differences in the nature of the interactions for these 2 populations exist. The low incidence of den-
tistry and surgery recommendations available led to the analysis of a fairly small sample of only 83 veterinarian-
client-patient interactions. For this reason, controlling
for the multilevel structure of the data set was not pos-
sible during statistical analyses. Future studies should
consider including a larger and more representative
sample of veterinarian-client-patient interactions.

Furthermore, the present study was limited to the investi-
gation of client adherence specific to dental and surgical
procedures. It is suggested that the nature of the
veterinarian-client-patient relationship is likely to be
influenced by the context (eg, the clinical problem and
the physical space) within which the interaction oc-
curs10, therefore, future research that examines the find-
ings of the present study in relation to the management
of other clinical problems (eg, medication and diet)
and environments (eg, emergency clinics) is needed.
Finally, research studying veterinarian-client commu-
nication, particularly in relation to decision making and
client adherence, would benefit from including a blend
of quantitative and qualitative approaches. The role of
veterinarian-client communication in client adherence
is complex; future qualitative research would provide an
inductive approach for further examining the intri-
cate nature of these interactions and their potential role
in client adherence. Including quantitative research
would allow researchers to test and better understand
findings within a broader population of veterinarians
and their clients.

a. Nogueira Lj. Veterinary-client communication during euthana-
sia discussions. MSc thesis, Department of Population Medicine,
Ontario Veterinary College, University of Guelph, Guelph, ON,

b. Laboratory of Dr. Debra Roter, Johns Hopkins Bloomberg
School of Public Health, Baltimore, Md.

c. Coe JB. Communication during veterinarian-client-patient interac-
tions in companion animal practice. PhD thesis, Department of
Population Medicine, Ontario Veterinary College, University of Guelph,
Guelph, ON, Canada, 2008.


e. STATA, version 10.0, StataCorp LP, College Station, Tex.

References

1. Shaw JR. Four core communication skills of highly effective


3. Donovan JL, Blake DR. Patient non-compliance: deviance or

4. Donovan JL. Patient decision making. The missing ingredient in

communications skills on patient satisfaction; recall, and adher-

6. DiMatteo MR, Sherbourne CD, Hays RD. Physicians’ charac-
teristics influence patient’s adherence to medical treatments: results from the Medical Outcomes Study. Health Psychol

7. Bullman DC, Svarstad BL. Effects of physician communication
style on client medication beliefs and adherence with antide-

8. Roter D. The enduring and evolving nature of the patient-phys-

9. Ashbury F, Iverson DC, Kralj B. Physician communication

skills results of a survey of general/family practitioners in New-

10. Ciechanowski PS, Katon WJ, Russo JE, et al. The patient-pro-
vider relationship: attachment theory and adherence to treat-

care and the patient-physician relationship. J Gen Intern Med

12. Roter DL. Patient participation in the patient-provider inter-
tion: the effects of patient question asking on the quality of
interaction, satisfaction and compliance. Health Educ Mongy

13. Hall JA, Dorman MC. Meta-analyses of satisfaction with medi-
cal care: description of research domain and analysis of overall

14. Bertakis KD, Roter DL, Putnam SM. The relationship of physi-
cian medical interview style to patient satisfaction. J Fam Pract


16. Kaplan SH, Greenfield S, Ware JE. Assessing the effects of physi-
cian-patient interactions on the outcomes of chronic disease.


analysis system to analyze veterinarian-client-patient commu-

communication patterns used during clinical appointments in

patient communication during wellness appointments versus
appointments related to a health problem in companion animal

discussions during clinical appointments in companion animal

26. Bomzon L. Short-term antimicrobial therapy—a pilot com-
pliance study using ampicillin in dogs. J Small Anim Pract

27. Barter LS, Watson ADJ, Middelson JE. Owner compliance
with short term antimicrobial medication in dogs. Aust Vet J

28. Barter LS, Middelson JE, Watson ADJ. Comparison of meth-
ods to assess dog owners’ therapeutic compliance. Aust Vet J
1996;74:443–446.

29. Grave K, Tanem H. Compliance with short-term oral antibacterial

compliance with short-term administration of antimicrobials to


32. Compliance: taking quality to the next level. Lakewood, Colo:

dispensing records to measure “clinical compliance” with recom-

34. Miller BR, Harvey CE. Compliance with oral hygiene recom-
mendations following periodontal treatment in client-owned

434   JAVMA, Vol 240, No. 4, February 15, 2012

Unauthenticated | Downloaded 09/23/23 02:21 PM UTC
35. Steel, DJ, Jackson TC, Guttmann, MC. Have you been taking your pills? The adherence monitoring sequence in the medical interview. *J Fam Pract* 1990;30:294–299.


### Appendix 1

Client-, pet-, veterinarian-, practice- and appointment-related demographic variables each tested for an unconditional association ($P < 0.20$) with client adherence to a dentistry recommendation, surgery recommendation, or both.

<table>
<thead>
<tr>
<th>Level</th>
<th>Demographic variable</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>Gender</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Age (y)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Education completed</td>
<td>— grade 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High school</td>
</tr>
<tr>
<td></td>
<td>Annual income (Canadian dollars)</td>
<td>35,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>36,000–60,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>61,000–100,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 100,000</td>
</tr>
<tr>
<td></td>
<td>Pet primary caregiver</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Relationship with pet</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Member of the family</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good friend</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Another mouth to feed</td>
</tr>
<tr>
<td></td>
<td>No. of visits to a veterinarian/y</td>
<td>—</td>
</tr>
<tr>
<td>Pet</td>
<td>Age (y)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Species</td>
<td>Dog</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td>Veterinarian</td>
<td>Participant identification</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>Years of clinical practice (y)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Communication skills training</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Practice</td>
<td>Scheduled appointment duration (min)</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Cost of a regular office visit (Canadian dollars)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Cost of a routine cat neuter (Canadian dollars)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Cost of a routine cat spay (Canadian dollars)</td>
<td>—</td>
</tr>
<tr>
<td>Appointment</td>
<td>Veterinarian-client-patient relationship</td>
<td>Regular</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not regular</td>
</tr>
<tr>
<td></td>
<td></td>
<td>First time</td>
</tr>
<tr>
<td></td>
<td>Visit type</td>
<td>Wellness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td>Verbal dominance score</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Measured duration of appointment (min)</td>
<td>—</td>
</tr>
</tbody>
</table>

— = Not categorized.

### Appendix 2

Five tasks of the clinical interview and 10 corresponding communication composites, each assessed in 3 directions (veterinarian to client, client to veterinarian, and veterinarian to pet) for a total of 30 items tested for an unconditional association ($P < 0.20$) with client adherence to a dentistry recommendation, surgery recommendation, or both.

<table>
<thead>
<tr>
<th>Task</th>
<th>Communication composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information gathering</td>
<td>Biomedical questioning</td>
</tr>
<tr>
<td></td>
<td>Lifestyle and social questioning</td>
</tr>
<tr>
<td>Information giving</td>
<td>Biomedical information</td>
</tr>
<tr>
<td>Relationship building</td>
<td>Positive talk</td>
</tr>
<tr>
<td></td>
<td>Negative talk</td>
</tr>
<tr>
<td></td>
<td>Social talk</td>
</tr>
<tr>
<td>Activation and partnership</td>
<td>Activation and partnership</td>
</tr>
<tr>
<td>Orientation</td>
<td>Orientation</td>
</tr>
</tbody>
</table>