Topics discussed, examinations performed and strategies implemented during canine and feline booster vaccination consultations

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Vaccination consultations account for a large proportion of the small animal veterinary caseload. The aim of this study was to determine the content of canine and feline booster vaccination consultations and gather opinions on strategies used to optimise these consultations. An online survey of UK veterinarians was conducted. Respondents were asked about the clinical examination performed and the topics discussed during vaccination consultations, as well as any strategies used to optimise these consultations. Finally, respondents were asked about the practicality and effectiveness of various potential strategies. A total of 662 responses were received. Most respondents always auscultated the chest during vaccination consultations (n=603/621, 97.1% canine consultations; n=587/610, 96.2% feline consultations). Microchipping was discussed more frequently during canine versus feline consultations (P<0.001). Over half of respondents (n=323/597; 54.1%) had tried strategies to optimise consultations, with supplementary reading material tried most frequently (n=203/597; 34.0%). There were a range of opinions around practicality and effectiveness of these strategies. The results from this novel study suggest that vaccination consultations vary in terms of the clinical examination performed, topics discussed and strategies used to optimise the consultation. This study has implications for practice by identifying potential ways to maximise the benefits of vaccination consultations.

Introduction

Preventative healthcare consultations (PHCs), in particular those involving administration of a canine or feline vaccination, account for a large proportion of the small animal veterinary caseload and represent an important opportunity to maximise patient health and welfare.1 Previous work has attempted to characterise PHCs as a whole, and has highlighted how these consultations differ from health problem consultations. Aspects of the PHC examined by this existing evidence base include consultation length,2 3 clinical examination findings,4 problems discussed,1 5 communication style3 and veterinarian satisfaction.6 However, even within PHCs, there are a broad range of reasons for presentation, as well as a range of different preventative procedures performed and treatments administered.1

Vaccination consultations account for the majority of PHCs, and yet to date there is little published literature examining the content of these consultations. A recently published systematic review highlighted the lack of evidence regarding PHCs with only seven manuscripts found. In only one of these papers was the ‘success’ of the consultation measured in the form of veterinarian satisfaction.7 Pet health plans, which allow clients to spread the cost of preventative healthcare across the year, have recently grown in popularity.8 These may potentially change the nature of the discussion during vaccination consultations, as it may be considered that preventative treatments have already been communicated to the pet owner upon joining the plan. In order to find effective ways to maximise the benefits of the small animal vaccination consultation, it should be known first what is currently being done in terms of both the content of the consultation, and in terms of any strategies already being implemented. In addition, in order to develop new ways to maximise the benefits of the consultation, it is essential to gather the opinions of veterinarians conducting these consultations on a daily
basis, and involve them in the process of developing such strategies. This will help ensure any approaches developed are both practical and effective in a first-opinion practice setting, and meet the needs of the end user.

The aim of this study was to determine the content of canine and feline vaccination consultations as reported by veterinarians, including aspects of the clinical examination performed and topics discussed. A second aim was to determine whether veterinarians are currently using any strategies to optimise the vaccination consultation, and to gather opinions on the perceived practicality and effectiveness of potential strategies which could be utilised during these consultations.

**Materials and methods**

**Population of interest**

The target population was all veterinarians currently conducting canine and feline vaccination consultations within the UK. The survey could be accessed by veterinarians globally, however only responses from UK veterinarians were included in the analyses reported in this manuscript.

**Questionnaire structure**

Given the potential differences between consultations for the primary course of a vaccination and consultations for a booster vaccination, the decision was made to focus on booster vaccination consultations only during the survey. A booster vaccination consultation was defined as ‘any consultation where an adult dog or cat was presented for a vaccination other than the initial vaccination course’. The survey comprised three sections, and was composed of multiple-choice, closed questions, Likert scale style questions and a few open free-text box questions (full survey provided in online supplementary material). Section 1 asked about the veterinarian and about their current role including the type of practice they worked in. Section 2 used Likert scales to ask about the content of a ‘typical’ booster vaccination consultation, namely how often different aspects of the clinical examination were performed and how often different topics relating to preventative healthcare and general pet care were discussed. Respondents who stated that they conducted booster vaccination consultations involving both dogs and cats completed this section twice, once for canine and once for feline consultations. Section 3 related to maximising the benefits of the booster vaccination consultation and asked respondents whether they had previously tried any strategies to optimise these consultations. Respondents who stated they had tried one or more strategies were asked via a free-text box to comment on the practicality and effectiveness of these strategies. Respondents were then given a list of potential strategies and asked to rate on a Likert scale how practical and effective they thought each strategy was likely to be.

**Questionnaire development and distribution**

The survey was developed online in SurveyMonkey (San Mateo, California, USA; www.surveymonkey.com) and pretested by researchers within the Centre for Evidence-based Veterinary Medicine. A pilot study was then conducted with several external veterinarians to ensure the questions were clear and the questionnaire could be completed within the suggested time frame of 15 minutes.

The final version of the questionnaire was launched on May 27, 2016, distributed via various methods (table 1) and remained open until March 31, 2017.

**Data management and analysis**

Responses were downloaded from SurveyMonkey (San Mateo, California, USA; www.surveymonkey.com) into Microsoft Excel V.14.0.6 (2010) for data management. Responses were removed from the data set from participants who were not veterinarians, veterinarians who carried out large animal veterinary work only or did not conduct canine or feline booster vaccination consultations. Responses from participants who had not answered these three questions, and so had not confirmed that they were the target population of the survey, were also removed. Responses from non-UK veterinarians were moved to a separate data set and only responses from UK veterinarians were analysed. Partial responses were included in the analysis provided respondents had answered the three questions described above. For all data presented, the total number of respondents answering each individual question will be given.

Pivot tables were used to generate frequency data for categorical variables (eg, type of veterinary practice)
and basic descriptive statistics were generated for numerical variables (eg, year of graduation) in Microsoft Excel V.14.0.6 (2010). To compare the content (ie, clinical examination and topics discussed) of a ‘typical’ booster vaccination consultation between canine and feline patients, data were exported into IBM SPSSV.21. Mann-Whitney U tests were carried out to compare non-parametrical ordinal Likert scale data between dogs and cats. Statistical significance was initially set at 0.05, with a Bonferroni correction applied to account for multiple comparisons, resulting in an adjusted significance level of P=0.002.

Free text from the open box question in Section 3, which asked about practicality and effectiveness of any strategies already implemented, was extracted into a separate Excel spreadsheet. Responses were read and then categorised by the strategy or strategies to which the comment referred. Selected quotes for each strategy will be presented in the results.

**Results**

**General respondent information**

A total of 1234 responses to the survey were received. Once the responses from people who were not veterinarians, veterinarians who conducted large animal work only and veterinarians who did not conduct small animal booster vaccination consultations were removed, 1105 useable responses remained. Subsequent removal of responses from non-UK veterinarians left 662 useable responses from UK veterinarians.

Of all UK respondents, 89.1% (n=590/662) conducted small animal work only, while the remaining 10.9% (n=72/662) worked in mixed practice. In terms of their current role, 63.1% (n=417/661) were assistant veterinarians, 31.9% (n=211/661) were partners or clinical directors, and the remaining 5.0% (n=33/661) mostly described themselves as locum veterinarians (n=19/33). The year of graduation ranged from 1957 to 2016 (median 2004, interquartile range 1995–2011). The majority of respondents (99.5%; n=636/639) vaccinated both dogs and cats, while a small number (n=3/639) vaccinated cats only.

In terms of type of practice, 66.0% (n=436/661) worked in an independently owned practice, 15.0% (n=99/661) in a corporate-owned practice, 14.2% (n=94/661) in a joint venture partnership, 2.3% (n=15/661) in a charity practice, 2.4% (n=16/661) in another type of practice (one respondent was unsure of their practice type). Almost half of respondents (48.5%; n=309/637) worked in a practice which scheduled a 10-minute appointment for booster vaccination consultations, while 44.3% (n=282/637) worked in a practice which scheduled a 15 minute appointment. The remaining respondents worked either in a practice that scheduled a different appointment length (ranging from 5 minutes to 30 minutes; 4.9%, n=31/637) or operated an open surgery with no scheduled appointment length (2.4%; n=15/637). Most respondents (72.1%; n=459/637) worked in a practice that ran a pet health plan, or similar, allowing clients to spread the annual cost of preventative healthcare via a monthly scheme.

**Content of a ‘typical’ booster vaccination consultation**

**Clinical examination**

Virtually all respondents said they would always or almost always auscultate the chest in both dogs (97.1%; n=603/621) and cats (96.2%; n=587/610) during a booster vaccination involving an adult patient (table 2). Almost all respondents said they would examine the mouth and teeth (96.6%, n=599/620 for dogs; 95.9%, n=588/613 for cats) and palpate the abdomen (90.3%, n=559/619 for dogs; 92.4%; n=563/609 for cats).

Very few respondents said they would always or almost always perform a rectal examination (0.6%, n=4/618 for dogs; 1.3%, n=8/608 for cats) or a neurological examination (2.1%, n=13/616 for dogs; 2.1%, n=13/608 for cats). Respondents stated that they would perform otoscopy, scan for a microchip, check capillary refill time, check pulse, perform a rectal examination and perform a lameness examination more frequently during canine compared with feline booster vaccination consultations (all P<0.001).

**Topics discussed**

The majority of respondents said they would always or almost always discuss parasite prevention with owners of dogs (66.6%; n=412/619) and cats (73.3%; n=445/607) during a booster vaccination involving an adult patient (table 3). Very few respondents said they would always or almost always discuss grooming (3.9%, n=24/615 for dogs; 5.6%, n=34/610 for cats) or behaviour (4.6%, n=28/615 for dogs; 5.1%, n=31/608 for cats).

Respondents stated that they would discuss microchipping, routine dental care, behaviour and breed-specific health problems more frequently during canine compared with feline booster vaccination consultations (all P<0.001). Conversely, respondents stated that they would discuss neutering and grooming more frequently during feline compared with canine booster vaccination consultations (both P<0.001).

**Strategies for maximising the benefits of the consultation**

**Strategies already trialled**

Just over half of respondents (54.1%; n=323/597) worked in a practice which had trialled one or more strategies in an attempt to maximise the effectiveness of the booster vaccination consultation. Another 43.9% of respondents (n=262/597) worked in a practice which had not yet tried any strategies, while the remaining 20.0% (n=12/597) were unsure as to whether their practice had tried any strategies.
The most commonly trialled strategy was the use of supplementary reading materials (eg, leaflets) for clients (34.0%; n=203/597). Veterinarians generally perceived these to be practical and easy to use, but were unsure how effective they were:

**Respondent 547:** ‘There is a cupboard dedicated to storage of client information leaflets at our practice so it is not too difficult to locate some relevant literature for most common problems. I am not sure how effective these leaflets are as they usually supplement verbal instructions/information’

Increasing the length of the consultation (18.6%; n=111/597) was the next most frequently trialled strategy, and was generally very positively perceived by veterinarians who had tried it, though some highlighted practical issues with longer consultations:

**Respondent 509:** ‘The 20 min appointment slots for boosters are very useful. Although not all boosters need 20 min (some are comfortably completed in 10 min if there are no issues) other animals come in with a range of things that aren’t right, or that the owners want to discuss. Owners often use the booster consultation as an opportunity to discuss things they’ve been monitoring for a while, and also to bring up behavioural problems etc. 20 min allows time for a full history, clinical exam and address any problems’

**Respondent 207:** ‘Increasing the allocated consult time is the best thing but if the practice is busy that does tend to be converted into catch up time’

Some veterinarians (12.6%; n=75/597) had used checklists during the consultation, however there were mixed opinions on this strategy, with many feeling it was useful in some circumstances but not others:

**Respondent 415:** ‘Useful for less experienced vets. There is a tendency for those who need it most to use it least!’

**Respondent 525:** ‘We use a checklist currently. Some vets feel it does add benefit to the consult but I personally

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### Table 2

| Examination Species (total n) | Always/AA n (%) | Often n (%) | Sometimes n (%) | Rarely n (%) | Never n (%) | P value |
|-----------------------------|-----------------|------------|----------------|-------------|-------------|---------|
| Examine skin/coat Dog (n=620) | 549 (88.5) | 53 (8.5) | 16 (2.6) | 2 (0.3) | 0 (0.0) | 0.719 |
| Cat (n=613) | 548 (89.4) | 50 (8.2) | 14 (2.3) | 1 (0.2) | 0 (0.0) | 0.478 |
| Examine mouth/teeth Dog (n=620) | 597 (96.6) | 18 (2.9) | 2 (0.3) | 0 (0.0) | 0 (0.0) | 0.935 |
| Cat (n=613) | 588 (95.9) | 21 (3.4) | 3 (0.5) | 1 (0.2) | 0 (0.0) | 0.028 |
| Examine eyes (no ophthalmoscope) Dog (n=620) | 554 (89.4) | 40 (6.5) | 14 (2.3) | 1 (0.2) | 0 (0.0) | 0.836 |
| Cat (n=613) | 584 (92.7) | 38 (6.2) | 13 (2.1) | 1 (0.2) | 0 (0.0) | 0.001* |
| Examine ears (no otoscope) Dog (n=620) | 551 (89.2) | 44 (7.1) | 19 (3.1) | 4 (0.6) | 0 (0.0) | 0.522 |
| Cat (n=612) | 541 (88.4) | 38 (6.2) | 21 (3.4) | 1 (0.2) | 0 (0.0) | 0.027 |
| Ophthalmoscopy Dog (n=611) | 25 (4.1) | 25 (4.1) | 25 (4.1) | 25 (4.1) | 25 (4.1) | 0.935 |
| Cat (n=608) | 33 (5.4) | 33 (5.4) | 33 (5.4) | 33 (5.4) | 33 (5.4) | 0.935 |
| Measure body temperature Dog (n=610) | 548 (88.7) | 50 (8.2) | 14 (2.3) | 1 (0.2) | 0 (0.0) | 0.836 |
| Cat (n=607) | 588 (95.9) | 38 (6.2) | 21 (3.4) | 1 (0.2) | 0 (0.0) | 0.001* |

*Aspects of the clinical examination for which responses differed significantly between dog and cats (on a Mann-Whitney U test at the Bonferroni-adjusted significance level of 0.002).

Always/AA, always or almost always.
find it awkward to complete with the client there and a little irrelevant’

Some veterinarians had experience with veterinary nurse involvement within their vaccination consultations (12.6%; n=75/597). A smaller subset of veterinarians (5.9%; n=35/597) had experience with running a separate veterinary nurse consultation before the booster vaccination consultation. Those with experience of veterinary nurse involvement generally found it to be useful though several acknowledged that it was often not practical due to limited staff, time and consultation space:

Respondent 476: ‘Using nurses to call in client, perform basic exam, scan chip, discuss neutering/parasites/teeth care/behaviour. Vet does rest of exam and then nurse gives vaccine. This works well in a charity practice for young and adult patients and clients get more time spent with them overall as 15 min appointment allowed. For geriatrics our vet does the full consult’

Respondent 568: ‘Nurses see all puppies/kittens before 1st vaccines and do 2nd vaccines – we had wanted to move to nurses seeing all boosters before the vet, however due to how busy nurse consultations are and the need to expand from 4 to 6 consult rooms we are unable to do this’

Smaller numbers of respondents worked in practices who had trialled an owner questionnaire before the consultation (7.9%; n=47/597) and most who had experience of this strategy did not feel it was practical or effective:

Respondent 632: ‘Tried questionnaires and they made life more difficult. If running on time owners were bothered that they didn’t have time to fill them in. Took more time to go through answers than it would have taken to ask the questions directly. Stopped them after a couple of weeks’

### Perceived practicality of suggested strategies

Overall, checklists and supplementary reading material were felt to be very practical strategies by 16.9% of respondents (n=100/591 and n=100/592, respectively), while increased consultation length and the use of an owner questionnaire before the consultation were felt to be very practical by only 8.8% of respondents (n=52/590 and n=52/592, respectively) (figure 1). Fewer respondents felt that further involvement of veterinary nurses, either during the current consultation (5.8%; n=34/591) or during a separate consultation (3.5%; n=21/592) would be a very practical strategy to maximise the benefits of the consultation. However, there was a full range of responses for each strategy, with no one strategy almost universally perceived to be practical or impractical by most respondents.

### Perceived effectiveness of suggested strategies

Increasing the scheduled consultation length appeared to be the strategy perceived to be very effective by the most veterinarians (20.3%; n=120/591) (figure 2). However, not all veterinarians shared this perception as 33.8% still gave increasing consultation length a rating between 4 (neutral) and 7 (very ineffective). For the other strategies listed, there was a wide range of responses with no one strategy standing out as being perceived to be effective or ineffective by most respondents.

### Discussion

This novel study is the first to describe in detail what UK veterinarians report they do during canine and feline booster vaccination consultations. Previous

| Topic | Species (total n) | Always/AA n (%) | Often n (%) | Sometimes n (%) | Rarely n (%) | Never n (%) | P value |
|-------|------------------|-----------------|-------------|-----------------|-------------|-------------|---------|
| Parasite prevention | Dog (n=619) | 412 (66.6) | 175 (28.3) | 30 (4.8) | 1 (0.2) | 1 (0.2) | 0.007* |
| | Cat (n=607) | 445 (73.3) | 146 (24.1) | 12 (2.0) | 3 (0.5) | 1 (0.2) | <0.001* |
| Neutering (if applicable) | Dog (n=619) | 365 (59.0) | 165 (26.7) | 70 (11.3) | 15 (2.4) | 4 (0.6) | <0.001* |
| | Cat (n=613) | 392 (61.9) | 179 (29.3) | 180 (29.5) | 50 (8.2) | 9 (1.5) | <0.001* |
| Routine dental care | Dog (n=620) | 232 (37.4) | 268 (43.2) | 104 (16.8) | 13 (2.1) | 3 (0.5) | <0.001* |
| | Cat (n=612) | 205 (33.5) | 193 (31.5) | 152 (24.8) | 52 (8.5) | 10 (1.6) | <0.001* |
| Grooming | Dog (n=615) | 24 (3.9) | 72 (11.7) | 245 (39.8) | 241 (39.3) | 33 (5.4) | <0.001* |
| | Cat (n=610) | 34 (5.6) | 94 (15.4) | 277 (45.6) | 175 (28.7) | 30 (4.9) | <0.001* |
| Behaviour | Dog (n=615) | 28 (4.6) | 155 (25.2) | 316 (51.4) | 112 (18.2) | 4 (0.7) | <0.001* |
| | Cat (n=608) | 31 (5.1) | 104 (17.1) | 280 (46.1) | 172 (28.3) | 21 (3.5) | <0.001* |
| Nutrition | Dog (n=615) | 79 (12.8) | 267 (39.9) | 247 (39.9) | 46 (7.4) | 0 (0.0) | 0.085 |
| | Cat (n=611) | 78 (12.8) | 225 (36.8) | 243 (39.8) | 61 (10.0) | 4 (0.7) | <0.001* |
| Breed-specific health problems | Dog (n=616) | 53 (8.6) | 239 (38.8) | 263 (42.7) | 60 (9.7) | 1 (0.2) | <0.001* |
| | Cat (n=608) | 42 (6.9) | 104 (17.1) | 250 (41.3) | 186 (30.6) | 26 (4.3) | <0.001* |
| Pet insurance (if applicable) | Dog (n=618) | 51 (8.3) | 165 (26.7) | 271 (43.9) | 110 (17.8) | 21 (3.4) | 0.167 |
| | Cat (n=608) | 63 (10.4) | 135 (22.2) | 258 (42.4) | 115 (18.9) | 37 (6.1) | <0.001* |

*Topics of discussion for which responses differed significantly between dog and cats (on a Mann Whitney U test at the Bonferroni-adjusted significance level of 0.002). Always/AA, always or almost always.
research involving observation of preventative healthcare consultations found that the majority involved a full clinical examination and other topics were frequently discussed. The current study adds to the current understanding of these consultations by revealing the full extent and thoroughness of this examination and the range of topics discussed in booster vaccination consultations. However these consultations vary widely and there are a number of areas where veterinarians alter their behaviours between species. Veterinarians reported they were already trying various strategies to optimise booster vaccination consultations with varying success. Not one particular strategy was universally perceived as being practical and effective, so any guidance developed around optimising these consultations needs to be flexible to allow for individual differences between veterinarians and practices.

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**Figure 1** The perceived practicality of suggested strategies* for maximising the benefit of the preventative healthcare consultation by respondents to the canine and feline booster vaccination consultation survey. Total number of respondents for each strategy are given in brackets in the left hand column. As this question was about perceived practicality of implementing this strategy, respondents working in practices currently using this strategy were asked to select ‘already using’. *Suggested strategies were: Consultation length: Increasing the time allocated for the consultation; Owner questionnaire: Providing owners with a questionnaire to complete before the consultation; Checklist: Use of a checklist by the veterinarian during the consultation; Veterinary Nurse (VN) in consultation: Involvement of a veterinary nurse in the consultation; Separate VN consultation: A separate consultation with a veterinary nurse following the booster vaccination consultation; Supplementary reading: Provision of supplementary reading material to owners, for example, leaflets.

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**Figure 2** The perceived effectiveness of suggested strategies* for maximising the benefit of the preventative healthcare consultation by respondents to the canine and feline booster vaccination consultation survey. Total number of respondents for each strategy are given in brackets in the left hand column. As this question was about perceived effectiveness of implementing this strategy, respondents working in practices currently using this strategy were asked to select ‘already using’. *Suggested strategies were: Consultation length: Increasing the time allocated for the consultation; Owner questionnaire: Providing owners with a questionnaire to complete before the consultation; Checklist: Use of a checklist by the veterinarian during the consultation; VN in consultation: Involvement of a veterinary nurse in the consultation; Separate VN consultation: A separate consultation with a veterinary nurse following the booster vaccination consultation; Supplementary reading: Provision of supplementary reading material to owners, for example, leaflets.
Interestingly, veterinarians reported that they would conduct various aspects of the clinical examination, for example, otoscopy and lameness examinations, more frequently in canine compared with feline booster consultations. This is perhaps unsurprising given that previous literature has suggested that otitis externa and osteoarthritis are among the most common diagnoses made during canine consultations, and are diagnosed more frequently in dogs than in cats. It could be that these diseases are more prevalent in the pet dog population than the pet cat population, and so these components of the examination are seen as more useful or important by veterinarians. In addition, it could be that owners are more likely to identify certain health problems in dogs compared with cats, for example, owners may notice lameness more readily in dogs due to walking their pet, which highlights a potential welfare concern for feline patients. There may be other reasons for these differences between the species, for example, practicality of performing the examination which could lead to some conditions being more likely to be identified early in dogs. For example, lameness examinations could include observing the dog’s gait by lead walking either within the practice or in an outside space, while assessment of a cat’s gait would potentially be more challenging. The Cat Friendly Clinic programme has acknowledged the unique nature and needs of feline patients, both during clinical examination in the consulting room and the rest of the visit, and gives suggestions for how practices can address these issues.

For example, secure consultation rooms, allowing feline patients time to emerge from their carrier and adjust to their surroundings, and the use of non-slip surfaces on consulting tables may all reduce stress for the patient and also aid the veterinarian in identifying any clinical examination abnormalities.

Topics reported to be discussed during the consultation also differed between canine and feline booster vaccination consultations. Microchipping and behaviour were both reported to be more frequent topics of discussion in canine consultations, which perhaps reflects recent changes in legislation around compulsory microchipping and the 2014 amendment to the Dangerous Dogs Act. However, even for canine patients, behaviour was still not among the most frequently discussed topics. This provides support from a large sample of veterinarians to initial findings examining behavioural discussions in 17 booster vaccination consultations. Rosheir and McBride found that while canine behavioural problems were common, they were rarely discussed with the veterinarian during the consultation, and when they were discussed, they were not fully explored and managed. However, previous research has also found that behavioural problems are discussed more frequently during preventative healthcare consultations than during specific health problem consultations. Therefore, implementing strategies which encourage owners to discuss behavioural problems, and facilitate the veterinarian in being able to effectively manage these problems, may help maximise the benefits of these consultations to both patients and owners.

Breed-specific health problems were also reported to be discussed more frequently for dogs during booster vaccination consultations, which could reflect the greater variety of pedigree dogs compared with pedigree cats seen in practice, or may reflect increased awareness of breed-related health problems in this species. Conversely, some topics, such as neutering, were reported to be more likely to be discussed during feline compared with canine consultations. This is consistent with findings from the People’s Dispensary for Sick Animals’ Animal Wellbeing report, which found that cats were more likely than dogs to be neutered. It perhaps also reflects differences in lifestyles between the two species, with cats often spending large amount of time outside. While this survey was only able to capture species differences in the content of the vaccination consultation, preliminary analysis of qualitative interviews with veterinarians has suggested that the consultation is also structured differently for pets of different ages. This is supported by previous studies, which have found that abnormalities on clinical examination are more common in older compared with younger animals presenting for vaccination and additional health problems are discussed more frequently, while preventative healthcare is discussed less frequently, as an animal ages. It is important to consider that it is likely not only the type of patient which influences the consultation. To some extent, what happens during the consultation is likely to be driven by a number of other factors, which were not directly captured by the current study but were touched upon in some of the open-box qualitative responses. These include owner factors, for example, their expectations of the consultation; veterinarian factors, for example, their experience and training; and practice factors, for example, consultation length, utilisation of support staff and the existence of pet health plans.

The results also suggest veterinary practices are attempting a number of strategies to make the most of the preventative healthcare consultation, with the strategies tried most frequently being those perceived to be the most practical (supplementary reading material) or the most effective (increasing consultation length). The findings also suggest that no one strategy appears to be universally perceived as both practical and effective by all veterinarians. Almost half of veterinarians worked in a practice which had not yet tried any of these strategies, which may be due to current lack of evidence to
support the use of these approaches. Interestingly, the majority of veterinarians worked in a practice which currently had a pet health plan in place. To the authors’ knowledge, this is the first study to examine what veterinarians are currently doing to maximise the benefits of preventative care. The findings are important as they suggest that UK veterinarians are striving to improve their practice, however as of yet, there is insufficient peer-reviewed research to support the use of any of these strategies to improve preventative healthcare consultations. Pet health plans are popular, with potential administrative and financial benefits for practices, however their impact upon the content of preventative healthcare consultations, and so upon pet health and welfare, remains unclear. Future research should focus on developing practical, effective strategies to optimise the consultations which are flexible enough to be tailored to individual veterinary practices. Development of future strategies should involve those with direct experience of these consultations, that is, veterinarians and pet owners, to ensure the strategies developed are feasible to implement in a primary-care practice setting. Until further evidence is available to support these use of the strategies currently being implemented, caution should be exercised when introducing any changes to preventative healthcare consultations to avoid potential negative consequences for patients, owners, veterinarians and practices.

There are several limitations to this study, particularly as it only harnesses the opinion of a small proportion of the UK veterinary profession. Comparison of veterinarian demographic data from survey respondents with data from the most recent RCVS survey of the profession shows a similar distribution in terms of number of responses from assistant partner/director and locum veterinarians. The median year of qualification of those responding to the booster vaccination survey (median=2004) was more recent than those responding to the 2014 RCVS survey (median=1997). However a direct comparison is difficult as the current study included only veterinarians who conducted some small animal work, who potentially have different demographics to veterinarians conducting large animal work only. In order to keep the survey concise, it was necessary to focus on booster vaccination consultations, so it is unclear how applicable these results are to consultations involving the primary vaccination course or another aspect of preventative healthcare. Also the survey predominantly focused on what veterinarians currently do and what they have tried, rather than why, though it is expected that the results of in-depth qualitative interviews with veterinarians, which were also conducted as part of the wider project, will explore this in more depth. The survey relied on veterinarians reporting what they did, rather than measuring what they actually do, and so is potentially open to recall bias. However, the areas of consistency with previous literature which have been identified suggest that the degree of recall bias is likely to be minimised. In addition social acceptability bias may have affected the findings as veterinarians may report what they feel they should do rather than what they actually do in PHCs. Online surveys also require respondents to have access to the internet and only 9/10 households in the UK have access which will exclude some people from responding to the surveys. However it is likely (but unknown) that the majority of vets have access to the internet at work. A number of different methods of distributing the link to this survey were used to maximise the chance of the target population knowing about the study. As some of this previous research was also conducted by the authors of the current study, particular effort was made to engage respondents who had not been involved in these previous studies.

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Ethics approval Ethical approval was obtained from the ethics committee at the School of Veterinary Medicine and Science, University of Nottingham for the collection of data through an online survey of veterinarians. The study compiled with The University of Nottingham (2016) Code of Research Conduct and Research Ethics.

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References

1. Robinson NJ, Brennan ML, Cobb M, et al. Investigating preventive-medicine consultations in first-opinion small-animal practice in the United Kingdom using direct observation. Prev Vet Med 2016;124:69–77.
2. Robinson NJ, Dean RS, Cobb M, et al. Consultation length in first opinion small animal practice. Vet Rec 2014;175:486.
3. Shaw JR, Adams CL, Bonnett BN, et al. Veterinarian-client-patient communication during wellness appointments versus appointments related to a health problem in companion animal practice. J Am Vet Med Assoc 2008;233:1576–86.
4. Banyard MR. Prevalence of intercurrent disease in dogs and cats presented for vaccination at a veterinary practice. Aust Vet J 1998;76:600–1.
5. Rochier AL, McBride EA. Canine behaviour problems: discussions between veterinarians and dog owners during annual booster consultations. Vet Rec 2013;172:235.
6. Shaw JR, Adams CL, Bonnett BN, et al. Veterinarian satisfaction with companion animal visits. J Am Vet Med Assoc 2012;240:832–41.
7. Robinson NJ, Betshaw Z, Brennan ML, et al. Measuring the success of canine and feline preventative healthcare consultations: a systematic review. Prev Vet Med 2018;158:18–24.
8. Ravetz G. Prevention is better than cure: promoting pet health plans. The Veterinary Business Journal 2017;170:16–18.
9. Pterie A, Sabin C. Errors in hypothesis Testing. Medical statistics at a glance. 3rd edn. Blackwell, 2009:52–3.
10. O Neill DG, Church DB, McGreavy PD, et al. Prevalence of disorders recorded in dogs attending primary-care veterinary practices in England. Prev Vet Med 2014;119:909–105.
11. Lund EM, Armstrong PJ, Kirk CA, et al. Health status and population characteristics of dogs and cats examined at private veterinary practices in the United States. J Am Vet Med Assoc 1999;214:1376–81.
12. Robinson NJ, Dean RS, Cobb M, et al. Factors influencing common diagnoses made during initial opinion small-animal consultations in the United Kingdom. Prev Vet Med 2016;131:87–94.
13. Cat Friendly Clinic. The consulting room. 2017. http://catfriendlyclinic.org/vets-nurses/in-the-consulting-room/ (Accessed 19 Dec 2017).
14. Veterinary R. Getting ready for compulsory microchipping. Vet Rec 2015;176:625.
15 Veterinary R. Missed opportunity. Veterinary Record 2014;174:514.
16 Robinson NJ, Brennan ML, Cobb M, et al. Capturing the complexity of first opinion small animal consultations using direct observation. Vet Rec 2015;176:48.
17 Jarvis S. Dogs should look like dogs. Vet Rec 2017;181:354.
18 Waters A. Brachycephalic tipping point: time to push the button? Vet Rec 2017;180:288.
19 PDSA. PDSA Animal Wellbeing (PAW) report 2017. 2017. https://www.pdsa.org.uk/media/3291/pdsa-paw-report-2017_printable-1.pdf (Accessed 19 Dec 2017).
20 Belshaw Z, Robinson NJ, Dean RS, et al. Owners and veterinary surgeons in the united kingdom disagree about what should happen during a small animal vaccination consultation. Vet Sci 2018;5.
21 Buzzen J, Robinson D, Williams M. The 2014 RCVS survey of the veterinary Profession. 2014. https://www.rcvs.org.uk/document-library/2014-rcvs-survey-of-the-veterinary-professions-synthesis-report/ (Accessed 19 Dec 2017).
22 Office for National Statistics. Internet access – households and individuals, Great Britain, 2018. 2018. https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/bulletins/internetaccessholdandindividuals/2018
23 Bryman A. Sampling in qualitative research. Social research methods: Oxford University Press, 2012:415–29.