

The Case of Veterinary Interprofessional Practice: From One Health to a World of its Own

Keywords

Veterinary, case study, hierarchy, motivation, trust, error

Abstract (approx. 150 words)

Background

Modern day veterinarians work in interprofessional teams: with professions relating to healthcare and the environment, as part of the collaborative 'One Health' approach to global issues, as well as within a veterinary healthcare team, caring for animals and their owners. Research regarding the veterinary professions' involvement in these interprofessional settings is sparse.

Purpose

This paper focuses on the veterinary healthcare team. It aims to investigate two research questions: 1) how is interprofessional working and learning facilitated, 2) why do interprofessional challenges arise, how can they be resolved? The answers will facilitate recommendations for veterinary interprofessional education (IPE).

Method

Two case studies in typical but contrasting veterinary practices were conducted. These consisted of three sequential weeks: 1) observing the whole team, 2) shadowing selected focus individuals from each profession and 3) interviewing focus individuals regarding teamwork. Triangulation was achieved by synthesis of emergent themes from observational field notes and interview transcripts.

Discussion

Facilitators to interprofessional practices included hierarchy, trust and value, different perspectives, formal infrastructure and professionalisation. Challenges included hierarchy, spatial and temporal work patterns, professional motivations, and error and blame.

Conclusion

Veterinary and human healthcare fields face similar interprofessional challenges. Real life observations, as described here, can provide important insight relevant to the design of IPE initiatives.

Introduction

Interprofessional practice has arisen in several fields. Initial advances have often been attributed to aviation, and aspects of this research have helped to shape advances in another highly researched area - human healthcare.¹ Healthcare is a substantial topic in its own right, with interprofessional research focussed on doctors and nurses² as well as, for example, dentists³, pharmacists and psychologists.⁴ It has been suggested that teaching students of healthcare professions almost exclusively in isolation may heighten differences in cultures and amplify boundaries between the professions,^{5,6} which may impact on the likelihood of achieving the potential benefits of interprofessional practice. Interprofessional Education (IPE) has therefore arisen, with potential outcomes relating to modification of interprofessional attitudes, acquisition of knowledge and skills relating to interprofessional collaboration, changing behaviours in the workplace and positive outcomes for clients/patients.⁷

Interprofessional healthcare can also be extended to include "One Health" dimensions. One Health is a global approach focussed on the importance of collaboration across disciplines. Multiple definitions and synonyms exist, one aim has been described as: "to improve health and well-being through the prevention of risks and the mitigation of effects of crises that originate at the interface between humans, animals and their various environments".⁸ The inclusion of animals in this approach highlights the importance of members of the veterinary profession in this equation.

There are examples of undergraduate One Health IPE which aim to foster relationships and understanding between veterinary and medical students. Research has included, for example: attitudes towards collaborative learning, where veterinary students taught

medical students basic surgical skills⁹; attitudes towards learning together on a small group activity regarding risk factors of a zoonotic disease¹⁰; the importance of veterinarians in the context of interprofessional problem solving in disease prevention¹¹; and a scoping review of existing IPE one health initiatives, citing nine articles and six university websites.¹² The results of these studies are largely positive, suggesting changing attitudes and awareness of the importance of veterinarians and physicians working together. However, they tend to recommend further research of this substantial topic, particularly regarding validation of concepts and development of outcomes measures to evaluate the effectiveness of IPE.¹²

This paper acknowledges the importance of One Health style IPE research¹³ and development, with the inclusion of veterinary professions as central members of the team. However, differentiation of individual roles within the veterinary healthcare team itself, has emphasised the importance of not only looking outwards beyond the veterinary professions, but also looking inwards towards veterinary practice.

To understand the relationships within veterinary practice, it is important to first compare the evolution of these professions. This has been reported in-depth in a previous publication¹⁴ and in brief below. These developments are not unique to the UK, but in this country the professionalisation of nurses has developed significantly. Veterinary surgeons' professional status dates back to a Royal Charter in 1844. In contrast, the first UK veterinary nursing training scheme was introduced in 1961 and Registered veterinary nurses are only recently (2011) accountable for their own actions; previously veterinary surgeons were accountable for all acts within the practice. In 2015, a new Royal Charter formally recognised veterinary nurses as a profession.¹⁵

Professional competencies relating to interprofessional practice have also evolved. The Royal College of Veterinary Surgeon's 'Day One Competences' state that graduating veterinary and veterinary nursing students must be able to "work effectively as a member of a multidisciplinary team in the delivery of services".¹⁶ The 'Codes of Professional Conduct' for both practising veterinary surgeons and nurses also states that they "must work together and with others in the veterinary team and business, to co-ordinate the care of animals and the delivery of services".^{17,18}

There are also a growing number of professions and occupations working alongside veterinary surgeons and veterinary nurses, both employed by, and external to, the core practice team. These groups, including practice managers, receptionists, animal physiotherapists and equine dentists, have received even less consideration in research.

With such developments to policy, the traditional hierarchical relationships that existed between the veterinary surgeons and their assistants, veterinary nurses, may eventually be replaced by a more horizontal structure between the two professions. Understanding this evolving relationship, and the outcomes for the practice, team, clients and patients will require continuing research.¹⁴

Therefore, within the veterinary field, day-to-day work involves teamwork between members of different occupational groups, but unlike human healthcare, veterinary and allied professions/occupations continue to be taught almost exclusively in isolation. One pilot study in the UK has evaluated two IPE resources which aimed to aid understanding of roles between the two biggest groups: veterinary surgeons/veterinarians and veterinary nurses. However, it was relatively small scale and, although it suggested a positive change in attitude, it did not demonstrate a lasting change for all measures.¹⁹ Very little published

research therefore exists relating to veterinary interprofessional practice and the potential to develop veterinary undergraduate or postgraduate IPE.

This paper makes a start at researching interprofessional practice as a foundation for IPE.

The potential for working relationships to be in flux due to the rise of new occupations, increasing status of old occupations and challenges to the historically dominant single profession, makes the present an ideal time to investigate veterinary interprofessional practice. The current study looks at this modern day phenomenon, with the aim of better understanding veterinary interprofessional practice as a precursor to the development of evidence-informed veterinary IPE. It adds to the interprofessional literature by considering specific issues relating to different groups²⁰ as well as considering similarities with healthcare.

Methods

Background

The methods and results reported in this paper are part of a wider study into veterinary interprofessional practice, as part of a PhD funded by the Bloomsbury Colleges Studentships, University of London, England. The overarching Research Question of the study is: How do modern day veterinary teams work and learn together interprofessionally, and what are the implications for professional education? This question emerged due to the developments in veterinary policy, and the paucity of empirical research in this area aimed at understanding the implications of interprofessional practice for the modern veterinary team.

The study utilised mixed methods with Social Network Analysis (SNA) as the first stage. SNA was used a quantitative method to map interprofessional interactions (for example receiving information or advice) within veterinary practices. The results from the SNA have been published as two articles within a veterinary journal^{21,22} and are revisited in the discussion section of this article, as they are interwoven in the outcomes of the overarching research purpose.

This paper details the outcomes of two case studies which formed the second part of the study. The Research Questions for this part were: 1) How is interprofessional working and learning facilitated in practice? 2) Why do interprofessional challenges arise, and how can they be resolved?

Design

Case study research enables in-depth investigation of modern phenomena through multiple methods and lenses²³⁻²⁵. Cases are bound in space and time; in this situation, an individual veterinary practice and their staff in 2014. The methods comprised primarily observations and interviews, as well as artefact collection.

Sample

Eleven veterinary practices participated in the first part of the overarching study, the SNA. Of these, two were chosen to become case study sites for the second part of the study. The choice was based on team composition (existence of multiple professions) and evidence of

interprofessional interactions (assessed via the SNA results). The sites were also chosen for their diversity of attributes. As Table 1 shows, the types of animals treated, location, size and corporate status are different in Case 1 compared to Case 2. The two chosen sites were approached to take part and both accepted.

Table 1. The Case Study sites

	Case 1	Case 2
Animals treated:	Small Animal	Mixed (Small, Farm, Equine)
Location:	Urban	Rural
Size:	Medium , 30	Large, 60
Veterinary Surgeons	7	26
Veterinary Nurses	6	14
Administrators	6	4
Receptionists	10	14
Branches:	5	4
Corporate Status:	Independent	Part of a larger group

Case Study Approach - Observations

Each study consisted of three separate weeks. The first two weeks involved two types of observations. The first week consisted of general observations of the team as a whole.

Observations were location dependent, for example, focussed on the interactions in reception, operating rooms or 'prep rooms'. This method was ideal for general teamwork observations, but failed to appreciate the continuity of interactions.

The second week therefore was designed to understand the flow of an individual's day. Six focus individuals were shadowed in each practice by continuously following them for one day. Focus individuals were chosen based on their profession (representatives of all were

chosen) and SNA results (individuals involved in many and fewer interactions were chosen equally).

Continuous field notes were made throughout the observations of ad libitum speech, summaries of conversations, actions and interpretations.

Case Study Approach - Interviews

The third week of each case study involved interviewing the focus individuals regarding teamwork to gain an understanding of the thoughts and feelings of the participants, which are difficult to capture during observations. Participants were asked how they perceived the veterinary team in which they work and what they thought were the impacts of the changing times of practices, professions and occupations. The interviews were audio recorded and transcribed verbatim.

Case Study Approach – Artefacts

In addition to these three sequential stages, artefacts such as photos were also collected throughout the observation period as supporting material.

Analysis

A Cultural Historical Activity Theory (CHAT) framework pioneered by Vygostky and extended by Engeström²⁶ was used. This promotes the consideration of subjects with different objects of activity (motivations) even when the ultimate outcome is the same (such as improving health of patients). Each activity system of an individual subject or group (such as a

profession) is based on rules, community, division of labour and instruments towards an object and an outcome. All of this is considered within the culture and the history of the group. This concept is especially applicable for the current study due to the contrasting historical development of the veterinary professions, and their potentially opposing cultures reinforced by their separate training. In addition, thematic analysis was performed on the interview transcripts in accordance with Braun and Clarke's six stages.²⁷

Triangulation according to Gorard and Taylor's²⁸ complementary notion was performed. This notion suggests that multiple methods provide different views of the object of study, and when taken together can provide a fuller picture. Triangulation was achieved by synthesis of emergent themes from the thematic analysis of the interviews, the CHAT framework applied to the field notes and interaction analysis of field notes and collected artefacts, which were all revisited iteratively during analysis. Emergent themes, developing inductively from each source, were cross checked between sources for confirmation or conflict. The themes are analysed against Pfaff and colleagues'²⁹ model of facilitators and challenges to interprofessional working within the team and organisational environment. In the current context this was adapted to the team environment, practice culture and professions' histories in relation to interprofessional working and learning in the veterinary workplace.

In addition to the multiple methods inherent of case studies and triangulation aiding the dependability³⁰ and validity of these results, participant checking was conducted on the interview transcripts and analysis and demonstrated agreement.

Ethical considerations

As a PhD student at the Royal Veterinary College and a previous veterinary receptionist, the author TK, who undertook the research, has elements of an insider researcher. However, TK did not know the teams under study and is not a qualified veterinary surgeon or veterinary nurse. The potential issue of power, for example, between interviewer and interviewee associated with belonging to professions of different status was therefore not apparent.

The project received ethics approval from the Royal Veterinary College's Ethics and Welfare Committee, Ref: URN 2013 0086H.

Results

The two chosen veterinary practices employed multiple professions (veterinary surgeons and veterinary nurses) and occupations (primarily receptionists and administrators) to conduct the work required of them by their patients and clients. The majority of the work observed in both practices related to small animals (pet species) which involved interactions between all professional groups. The medium and large size of the practices allowed many instances of interprofessional interactions to be researched.

The observations in both practices totalled 220 hours and produced almost 250 pages of field notes. The 12 interviews totalled eight hours, producing more than 160 pages of transcripts. The key findings from the triangulation between these datasets is presented in the summary below.

Summary

A summary of the themes that emerged from the case studies is illustrated in Figure 1.

Factors could be identified as facilitators or challenges to interprofessional working and learning in the veterinary workplace, with hierarchy contributing to both sides of the tension.

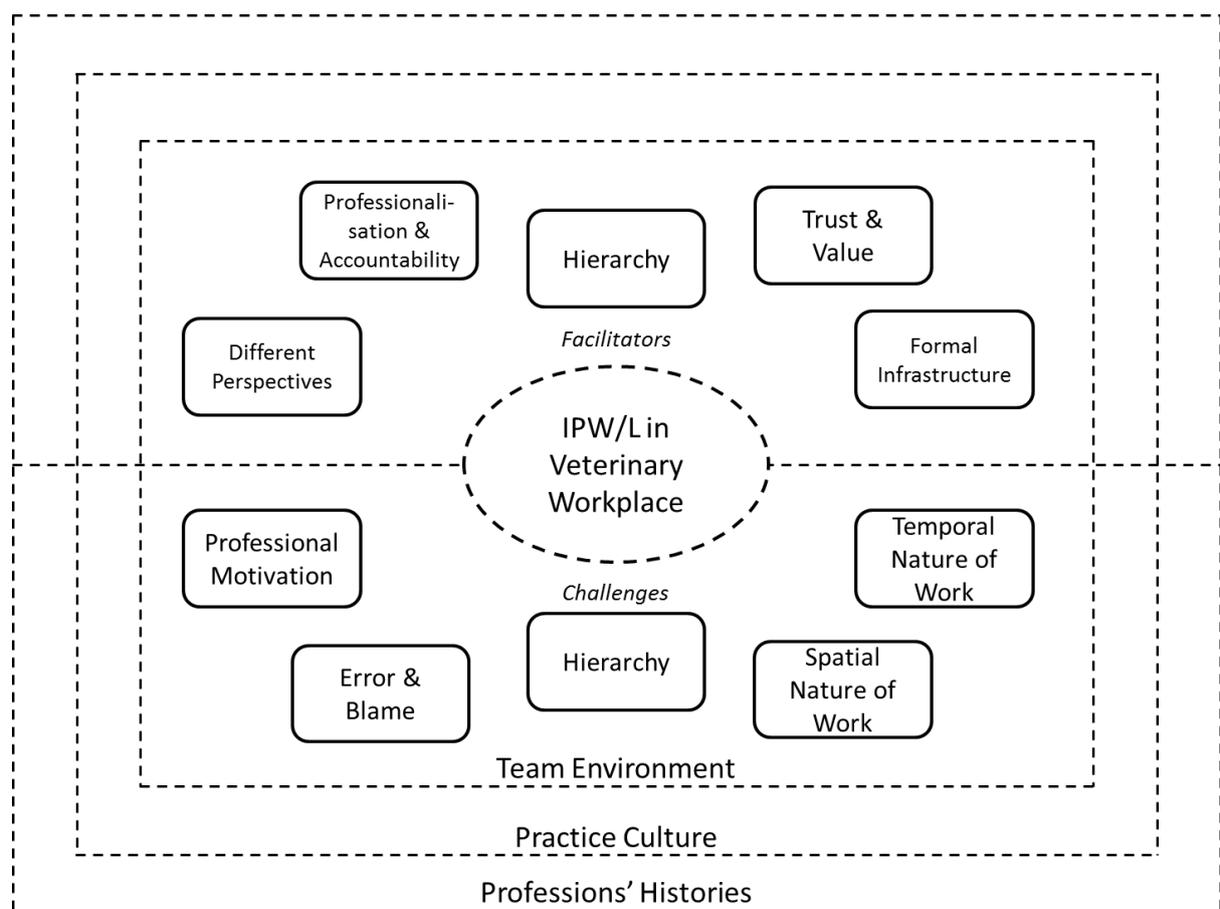


Figure 1. A depiction of the main themes from the case study approach which are facilitators or challenges to interprofessional working and learning (IPW/L) in the veterinary workplace, and which are in turn affected by the practice culture and professions' histories. Developed from Pfaff and colleagues.²⁹

This section now considers each theme in detail. Interpretations are given and evidence of the theme is provided via interview quotes and field notes. For simplicity, field notes utilise the abbreviations: VN when referring to a veterinary nurse, VS for veterinary surgeons and A for administrators. The numbers do not relate across field notes excerpts. However, for interview quotations, the speakers are identified through consistent coding.

Hierarchy

The communities of both case study practices incorporated hierarchical organisations of work, which were actively promoted. From a managerial perspective a hierarchy enables information to be cascaded down a stipulated route and for individuals to be able to identify their line manager and mentors. For example, Case 2 had a structure whereby veterinary nurses would talk to a head nurse regarding any problems. In turn, the head nurse would bring the matter to the attention of the practice partners or the HR/Practice Manager. One partner, described the Head Nurse as being:

a really good ambassador between the Directors and the (sic), certainly the nurses
(Interview, Veterinary Surgeon 3).

This hierarchy, with important mid-level and top-level managers, highlights the concept of 'key individuals' who link the whole team which may otherwise be split into professions or geographically separated branch practices, for example. Observable key individuals tended to be appointed leaders such as managers, partners or head nurses. These individuals are vital for resource flow and they broker information across professional boundaries. A

hierarchical work structure can therefore be a facilitator of effective interprofessional work; however it can also be a challenge.

The hierarchy was largely based on profession (division of labour). For example one veterinary nurse spoke about receptionists:

[They will] come and give us a hand but I like them to know, sounds really awful doesn't it, they are receptionists, they need to know that they are out here and we are out there, and if we ask you that's fine, but you know you can't just come and hold an animal (Interview, Veterinary Nurse 1).

Extensive interprofessional interactions were, however, observed, including individuals seeking advice from those with the appropriate knowledge, regardless of their profession.

"How long can you keep dromodil drawn up?", [VS] asks, "can it wait a week?", "just 24hrs" [VN] suggests, so they will keep it just for now. They talk how best to move [the dog], [VS] says she'll get a big blanket. They pop [the dog] in the consultation room, he's quite awake [VS] says ... "What else can we do [VN]?!", [VS] asks, as the dog is trying to escape, already climbing up the door. [VN] recommends he's in the safest place, can't do much more. [VS] asks [VN] if there is anything drawn up for [another patient], [VN] shows her. [VN] tidies the x-ray table and [VS] gets x-ray sorted. "Can I bring the [next patient]?" "Yes, we're good" [VN] says. (Field Notes, Case 2)

Several focus individuals specifically mentioned trust. They recognised that there was trust between the professions but described the need to gain each other's trust, and to not put too much trust in someone (for example a student). Veterinary nurses were trusted to use their initiative. Their ability to prompt the veterinary surgeon was valued as indicated by the following veterinary surgeon's quote and a field notes excerpt depicting the same veterinarian's work with a veterinary nurse:

having excellent experienced [Registered Veterinary Nurses] who will sort of say have you seen this cat... come and look at the way it's behaving, or you know I'm just a little bit worried about this case, ... you know they are an excellent prompt to me because I think they pick up things that I'm, you know, I may well miss (Interview, Veterinary Surgeon 1).

[VN] mentions a drug, [VS] says "I was also considering that", [VN] says "2mg?" [VS] agrees (Field Notes, Case 1).

Veterinary surgeons often told nurses that their ideas were good, which was appreciated by the nurses who were keen to have an impact on patient care. The following quote highlights respect for nurses and also supports the existence of a hierarchy based on knowledge/experience:

I can think of loads of clinical situations where ... the senior nurses are just invaluable... there are times, certainly out of hours and things when you know they can be really useful for bouncing things off ... [VN] probably could do 90% of the things I do on a, a day to day basis, they might not be happy about doing it, but

certainly umm certainly diagnostic type things ... are pretty good you know because they've seen it so often (Interview, Veterinary Surgeon 3).

There was a palpable team ethos, with individuals from all professions valued as colleagues. Team members were keen to help each other, especially within the intraprofessional nursing team, but also across professions. A veterinary nurse explains:

we all support each other really well, even in our different roles, where if I'm stuck with an insurance issue, I can go and ask [Branch Manager] and she'll help me, the same as if she was stuck with, I don't know, something like a consent form or something, she'd come through and ask us (Interview, Veterinary Nurse 2).

This quote also demonstrates the flexibility of roles which individuals take on in order to be of assistance to their colleagues. However, for the clinical roles, there are important legalities which also affect the division of labour and restrict some blurring of roles.

Different Perspectives

In addition to the nurses, the team valued the administrators for performing roles they could not (or did not want to) do. In particular, the different perspectives of the administration managers were identified as being very useful to the clinically minded partners as this HR manager explained:

[The partners say to me] we've got this problem, how would you tackle it, if they are not sure or they are still throwing some ideas around, you know I'll put in a different

perspective again very often, umm and sometimes that's helpful to them ... so in that regard I think they value my thoughts and my opinions (Interview, Administrator 1).

Field notes supported this claim as veterinary partners were observed to discuss important business and personnel issues with administrators, such as practice or HR managers. For example:

[VS] and [A] first discuss [a colleague], who is under pressure and the team are offering all the help they need... They move on to staff performance updates The nurses will have difficulty fitting it in ... [as] the nursing team is about two people down. They also talk about the changes in reception ... They decide the best way is not a paper memo to all but to cascade it through a face-to-face meeting (Field Notes, Case 2).

Formal Infrastructure

An increasing number of formal meetings involved multiple professions and were therefore facilitators to interprofessional working and learning. At Case 1, the HR Manager, Practice Manager and Head Nurse had recently been invited to join the Management Team and were having significant impact on the decisions made at this level. Similarly, Case 2 had started a 'Rep Group' which included a member of each profession from each branch who were enlisted to provide feedback to the partners. The existence of these groups extends the suggestion that all professions' views are valued. It is also further evidence of the existence of key people, who are boundary spanners, linking members of different groups, in terms of professions (or for example, branches or shifts):

“Representative group meeting, anything to add?” [A] asks [VN], “ambulance” she replies. [A] needs to put things forward to [VS – Director] and then it’s easier ... to set a date (Field Notes, Case 2).

Professionalisation and Accountability

A specific consideration of the study was the effects of the professionalisation of veterinary nurses and the subsequent level of accountability that they hold for their own actions. The veterinary surgeons and veterinary nurses interviewed did not perceive a significant difference in their own, or each other’s, behaviours upon the recent changes in legislation which have led to the accountability of nurses. They clarified this by suggesting that if there was trust and value within the team prior to the introduction of Disciplinary Procedures in 2011, then there was still trust and value now. If there was no trust, then changing the legal status of veterinary nurses will have little impact.

The two case sites were chosen for their levels of interprofessional working and for their enthusiasm to take part in research; which may imply the partners’ confidence in the working within their teams. Other practices may not have quite as positive experiences as these practices. Even within these two practices there were challenges to interprofessional practice, including the profession based hierarchy revealed earlier, as well as the spatial and temporal nature of work, differing motivations and, errors and blame.

Spatial and Temporal Nature of Interprofessional Working

A salient factor affecting interprofessional work identified on day one of observations was that interprofessional interactions are affected by space and time. The division of labour within the teams means that veterinary surgeons spend a significant amount of time in consultations and during this period interact primarily with receptionists regarding charging the client, and the client themselves. For approximately two hours in the middle of the day, surgical operations are conducted, and it is during this time frame that veterinary surgeon-veterinary nurse interactions primarily occur. Not only do they discuss the case in hand, but veterinary nurses were also observed to take this opportunity to highlight thoughts or concerns about other patients.

The spatial and temporal nature of work also relates to the existence of branches within the practice. Case 1 consisted of five branches; two of which did not have clinical staff on site during the whole day. They were, at times, more akin to a shop. The unavailability of veterinary surgeons within branches was seen as a potential issue and required specific communication between the veterinary surgeons and veterinary nurses. As one practice manager described:

I think one pitfall, but it's not, there's not another option is when the vets go for lunch, they leave site ... they hand over to the nurses so that's how we get around it (Interview, Administrator 2).

Professional Motivation

One of the significant aspects of the activity systems involved in CHAT is the object of activity. This is the underlying motivation for an activity which leads to the final outcome.

Motivation may differ between individuals and professions, and may not even be fully conceptualised by each individual as they perform their actions. The case studies demonstrated different primary motivations for each professional group, which could partly explain why tensions may exist within veterinary practices.

For veterinary nurses, patient care, or animal welfare, remained their primary concern and was an area they felt they must champion to veterinary surgeons:

[Veterinary surgeons] are hands off, like, compared to us ...I think the animal's kind of welfare is our job; the vet comes in, does the [operation] and then is gone

(Interview, Veterinary Nurse 2).

The area with perhaps the most significant impact on the wellbeing of the patient, as well as the emotional status of the veterinary nurses, pertains to pain relief. The following selection from a veterinary nurse's interview highlights how nurses are trying to deal with this aspect of work:

We are sort of trying to mould [the veterinary surgeons] a little bit ... I think [VS] thinks that ... I waffle on about pain relief all the time, 'can this dog have more pain relief?' He does look at me as if to say hmmm, so I think sometimes he thinks I'm a bit of a broken record, 'can it still have pain relief?!' (Interview, Veterinary Nurse 3).

In the majority of cases the veterinary surgeon immediately agreed to provide pain relief, although on one occasion they did not.

Veterinary nurses also clearly felt responsibility towards clients. One nurse suggested that clients may be more likely to air their concerns to a nurse than to a veterinary surgeon and again described managing the veterinary surgeons:

Sometimes I think it takes the nurses to actually say to the vets, look this is this, and she's rung and she needs a phone call and you need to do this and all of them I think are reasonably happy being managed for their cases and their phone calls (Interview, Veterinary Nurse 1).

Consideration for clients was further evidenced by observing this veterinary nurse with regard to financial aspects:

[VN] asks if the cost can be under estimate, it was approximately £800 and [VS] agrees it can be £600 as it was so quick (Field Notes, Case 1).

In comparison, veterinary surgeons were more overtly focussed on the clinical, diagnostic, side of treatment. When speaking about the administrative side of the practice, one veterinary surgeon noted:

We are vets because we want to do clinical work (Interview, Veterinary Surgeon 3).

The positive recommendations from clients on the two practice's social media sites and during my observations allow me to infer that the veterinary surgeons also have a good relationship with their clients. Veterinary surgeons who are partners also view the practice as a business and this forms another part of their motivation. This comes with some difficulty for a number of veterinary surgeons but easily for others. In his interview, Veterinary Surgeon 3 went on to say:

There are some [veterinary surgeons] who are happier than others to drop clinical work to concentrate on practice management (Interview, Veterinary Surgeon 3).

Veterinary Surgeon 3 acknowledges a reliance on administrators to carry out much of the management work. The practice managers have the business knowledge that veterinary surgeons do not necessarily gain through their education, or want to learn post-qualification.

The HR/Practice managers had motivations in addition to the business; for example, the HR manager at Case 2 had an obvious pastoral role towards all staff.

Receptionists tend to primarily focus on the client. One receptionist explained:

[A Receptionist's] purpose is to retain and maintain clients and bring in new clients
(Interview, Receptionist 1).

Error and Blame

During the case studies, observations focussed on positive interprofessional working episodes. However, a number of errors were observed, according to an inclusive definition which considers all behaviours resulting in potentially negative effects to the practice, team, client or patient. As the topic of errors is substantial in its own right, the results regarding error and blame are explored in depth in an article within a veterinary specific journal.³¹ In summary, the 40 instances identified as an error mainly related to communication mistakes – both interprofessional and intraprofessional.

Discussion

Interprofessional practice is now an established part of the provision of veterinary services. The findings from this study provide initial insight into the facilitators and challenges of interprofessional work in veterinary practices. Key facilitators include the trust between the groups and the value of differing perspectives. This is supported by a hierarchy and infrastructure of meetings promoting interprofessional interactions. However, the hierarchy and the structure of work (temporal and spatial) also reduce the potential for positive interprofessional interactions. The differing motivations of the groups and potential for error from poor communication are also challenges to effective veterinary interprofessional work. It is anticipated that the results of this study may be used to guide future IPE, better aligned to the realities of practice.

The professionalisation of veterinary nurses is something of which the profession can be proud³² and the observations and interviews all demonstrate a level of interprofessional work which is based on trust and value towards a veterinary nurse's skills and knowledge. However, the traditional hierarchical structure within a veterinary practice, with veterinary surgeons at the top, is unlikely to dissolve quickly. SNA scores supported the observational data which demonstrates a vertical structure for many interactions.²² This is not claimed to be wholly negative, as working and learning within your profession is vital for sharing best practice between colleagues. However, it is suggested that hierarchies should not be based solely on homophily – the desire to only interact with those similar (such as in the same profession) to ourselves, as this may restrict the information available to a group.³³ Resources such as advice should instead be sought from the most knowledgeable person available, whatever profession they are from. This reflects 'value-rationality' whereby authority is based on expertise rather than status.³⁴ The case study observations and

previous SNA results both highlighted frequent interprofessional interactions and identified, therefore, a fluid and complex hierarchy within the practices. As the examples quoted show, individuals frequently consulted others based on their knowledge rather than simply their profession. This could indicate that they place value on their opinions. Similar results have been identified in healthcare. A dynamic and informal hierarchy, with a foundation of knowledge and expertise, has been demonstrated in primary healthcare teams,³⁵ while considerations of newly qualified doctors and experienced nurses portrayed a complex structure where awareness of nurses' expertise was evident, but superseded by the culture of continuing medical dominance.³⁶ A recent study by Barrow et al.² used an Activity Theory framework, similar to that used here, to consider conceptual differences between doctors and nurses in hospitals. The authors suggested that co-configured, joined-up work was evident in their study, and the traditional hierarchy was overruled at times by attention to competence. However, the historical autonomy of the senior doctor, and the need for nurses to adapt to their approaches, remained. They also noted that, due in part to separate education and cultures, the professions had different views of work (nurses, holistic; doctors, focused concerns).²

Different professional perspectives, based on underlying motivations, can be both positive and negative for teamworking. Different viewpoints and expertise can enable novel decisions and solutions to be considered,³⁷ that any one profession alone would not have identified, enabling a team of experts to form an expert team.³⁸ This was highlighted through partners seeking practice managers' advice. However, contrasting motivations can also lead to disagreement over care or lack of understanding of decision making processes. For veterinary surgeons there are several factors involved in ethical decision making,

including the patient, client, practice, profession and the veterinary surgeon themselves.³⁹

The practice must be financially viable, the client must be satisfied, the environment should be as stress-free for the staff as possible, and perhaps above all, the animal patient must be treated. For any one individual and one case, there can be tensions between these demands. A client who cannot afford the best evidence treatment, a patient whose welfare will suffer in the short term for a longer term cure, raising consultation fees to pay for new technology. Each profession, it is claimed here, has a primary object of activity, or motivation. In summation, and not certainly exclusively, a veterinary nurse's focus on welfare, a veterinary surgeon's focus on diagnosis, an administrator's focus on the practice team and the business, and a receptionist's focus on the client may lead to conceptual differences in opinions of work and subsequently tensions.

During the observations, veterinary nurses (who cannot legally prescribe certain drugs), frequently asked the veterinary surgeon if the patient could have pain relief. More often than not, the answer was an immediate yes. It is possible that the veterinary surgeon simply had not thought of it prior to that moment, but would be equally as willing to prescribe medication. These results can also be understood in light of the higher ratings of pain by veterinary nurses over veterinary surgeons.⁴⁰ In one notable situation, despite repeated requests by veterinary nurses for pain relief following a standard procedure, the veterinary surgeon refused. It is not within this paper's aims to say whose decision was 'right'.

However, a number of nurses expressed some difficulty working with this veterinary surgeon. This has implications for maintaining a positive working environment and providing the best possible care by making use of the knowledge and skills of all members of the veterinary team. In human healthcare, similar findings relating to nurses being more prone

to rate pain higher, or more willing to administer pain relief are seen,^{41,42} reiterating the challenges faced by professions who are limited in their actions and work under the guidance of a traditionally higher status profession.

This study also demonstrated the relevance of interprofessional working, especially communication, for quality of care and patient safety via the identification of errors. Errors relating to challenges of the system, rather than an individual's mistake, are increasingly recognised in healthcare⁴³ and are beginning to be researched in the veterinary field,⁴⁴ as explored in a further publication from this overarching study.³¹

Case studies are an ideal approach to investigate interprofessional working in veterinary practices. The benefits of case studies include researching a phenomenon which has multiple variables of interest, in depth²³ and through a variety of lenses.⁴⁵ This aligns with the multi-professional view of interprofessional working. Using case studies allowed the many sources of data available within a veterinary practice to be investigated and analysed together, strengthening the construct validity²³, or credibility³⁰, of the results. However, as case studies are invaluable for understanding the precise situation they address, generalisation of results should be done with care. The case studies enabled a vast amount of data to be produced to which it is difficult to do justice. It is anticipated that through a collection of publications, it will be possible to formulate a picture of modern day veterinary interprofessional working in England.

The implications for practice of the current study are that trust, value, and interactions based on experience, should be fostered within veterinary teams. It is increasingly recognised that despite electronic networking and the rhetoric around connectivity, silos develop in organisations as a consequence of growth and homophily among those with

more and more specialised duties.⁴⁶ Bridging these divides is essential for organisational efficacy and efficiency, both vital for quality of services and provision of safe care. Key people, who provide links between groups, are important for the team's structure and health, and therefore such individuals have valuable roles whatever the professional allegiances. In-house, continuing professional development initiatives, which aim to foster understanding of each other's roles, experience and motivations, may therefore aid teamwork.

There are also potential implications for undergraduate education of veterinary students and veterinary nursing students, who are currently taught in isolation. The real life contexts of interprofessional working identified in this study, such as roles during operations, could form the basis for undergraduate veterinary IPE. Interventions should be sympathetic to the conceptual differences of the professions, as suggested by Barrow et al.² in healthcare, and should promote complementary approaches to care which can offer new insights to improve animal welfare and client care.

Further research regarding veterinary professions and occupations within both One Health IPE and veterinary specific IPE are required to continue to explore the ever changing nature of veterinary work. Specifically, longitudinal case studies within veterinary practices in a variety of countries, which have and have not implemented IPE initiatives, would be valuable to track the progression of veterinary interprofessional practice. In addition, it is suggested that the methodological approach used in the wide study, of which these case studies form a vital part, could be a model for other contexts.

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Declaration of Interest

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