

VNJ

VETERINARY NURSING JOURNAL

Rehabilitation of
an orange-winged
Amazon parrot

Investigating the
experiences of
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10 Rockefeller habits
for great teamwork

How to build trust in
client relationships





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[1] Kanchuk et al. (2002). ©2022 Royal Canin SAS

Welcome

Welcome to your new look VNJ! We hope you enjoy this issue – we'd value your feedback if you have a moment to get in touch.

You may have noticed that your copy came in a paper envelope and it has been printed on paper which hasn't been heavily processed, to help lower VNJ's environmental impact in regard to the BVNA's Investors in the Environment Bronze Award.

If you want to opt out of receiving a printed copy and would prefer to receive it as a digital journal instead, just go into your BVNA membership account. We've made this an option in response to feedback about environmental sustainability. Alternatively, use the QR code below to link to the digital journal or find it on the BVNA website: www.bvna.org.uk.

Inside the journal, we've added a notes section where you can write your learnings for your 1CPD reflective record. Where available, we've also added hyperlinks to the references which you can access via the digital journal. As part of the new look, VNJ is transitioning from the Harvard to the Vancouver referencing style, so there may be a mixture of both styles during this transition period. Finally, we've changed the design of the articles to make them more accessible to neurodivergent readers.

Get involved

Visit the BVNA website for details on how to get involved with the Journal, such as by uploading photographs of a favourite patient, saying 'thank you' to a colleague, or submitting an interesting case study. There are template documents to help you.

We are keen for readers to get more involved with the BVNA, and VNJ is a good way for you to put questions to the BVNA Council, reply to opinion pieces or share comments. Email your thoughts to: vnj@bvna.co.uk.

Stakeholder updates

The Journal will also keep you up to date on how stakeholder organisations represent the vet nursing profession. For example, VN Futures is keeping the sustainability of the veterinary nursing profession in mind and has developed two short videos, aimed at young children, about the VN role. It also has resources you can use when visiting local schools on career days. Visit www.vnfutures.org.uk for further information.

The BVNA is leading the VN Futures Diversity and Inclusivity working group (DIWG), and you may have already seen role models sharing their stories to inspire new people from all backgrounds to join the veterinary nursing profession.

Doggie diary

On a personal note, you'll be glad to hear that Luci and Lily (pictured) are very well and even vaguely behaving themselves! They're helping me with my neighbour's two little bichon frise: Molly and Marley. It can be a bit scary when they're all running around the garden; I'm worried Lily will go into full lurcher mode and eat them. They aren't much bigger than the rabbits she chases and they're definitely smaller than the muntjac she races with in the woods. Luci just looks confused by these small white bundles of fluff racing around and pinching his bed and, to be fair, they aren't very white when they get home.

I hope 2022 develops into a good year for you. Take time for yourself and ask for help when you need it. Have the confidence to reach for your goals – you can do it! Please keep in touch and don't hesitate to contact me if you have any questions, content ideas or submission queries.

Nikki Ruedisueli

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Scan the QR code to access the digital edition with hyperlinked websites and references (where available).



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ISSN:1741-5349

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Veterinary Nursing Journal is designed by Salt Media and printed by Latcham Press.



Neurodiversity in veterinary nursing



Recognising, developing and harnessing the many strengths that neurodiversity can bring to the veterinary profession will have far-reaching benefits for all, says **RVN Lacey Pitcher**.



As a profession, we're embracing the fact that each of us has different skills and niches. We're beginning to understand the power of harnessing them and utilising our strengths better. This is huge progress.

In my career, things have come a long way – even the foundations of how we teach: we now appreciate that

everyone learns differently and that resources are most helpful when they support these differing styles. I could choose to reflect on the timing of these advances and be frustrated that my own journey was harder because we hadn't yet made these leaps in learning, but that wouldn't be helpful to anyone. Frustration is often the thief of growth and rarely gleans a positive reflection.



Challenge of learning

In retrospect, training was hard for me. I didn't understand why I couldn't communicate my struggles and, thinking back, that probably made it harder for my mentors to help me. If I didn't know what I needed or why I found it challenging, or even that it was harder than it needed to be, then why would anyone else?

Fast forward to today and I'm a proud RVN, mentor, BVNA Council member and an accomplished professional, passionate about debunking some of the challenges I faced. I now know I hadn't been alone in my struggles: there were lots of people like me.

At school, I didn't like reading aloud but I was a high achiever. I exceeded expectations and hit the grades I needed. I was in the upper sets for core subjects and often chosen to buddy new students. I was in top sets for English and literature — my GCSE grades were C and A* respectively. All the signs were there but the stereotypes around neurodiversity led people to believe there was a strong correlation between intelligence

and brains that are wired differently. My brain is merely different and there is power to be harnessed in understanding that.

'My hunger for learning was at an all-time high when I threw in the towel'

I was passionate about becoming a veterinary nurse, but I gave up in my second year of training. I quit and went to work in car insurance. I'd become disillusioned and burnt out. The very passion that first drove me to become a nurse had become a burden. I wanted it so badly, yet it just wouldn't click. I left deadlines until the last minute and struggled with structure — despite being surrounded by mentors who liked structure. To them it looked like I didn't care or was flippant. In truth, my hunger for learning was at an all-time high when I threw in the towel, but the training system wasn't built for minds like mine.

Getting a diagnosis

After years of struggling, I sought help – which was a leap of faith. Late diagnosis resulted in a multitude of terms being attributed to me. It was a revelation and as if I'd been handed a book that could translate my brain's language; a manual for a different operating system to that being used by the majority of people. They were on iOS, I was using Android. Different, not less. I returned to nurse training and passed with flying colours. I finally understood how to utilise the way my brain processed information and it all slotted into place.

Working in practice

Since graduating I've taken steps to slowly relearn how best to use my brain and where I can utilise the differences in order to thrive. GCHQ states: 'With the right mix of minds we can achieve great things' and I firmly believe that should translate to veterinary nursing and the wider profession. Around one in seven adults in the UK are neurodivergent (The Donaldson Trust, 2021). This broad umbrella term includes, but isn't limited to, ADHD, dyslexia, dyspraxia, dyscalculia and autism. Many neurodivergent people have more than one element. I, for example, have epilepsy, ADHD and dyslexia – each of which comes with its own challenges and misconceptions. Further understanding of each element has allowed me to adapt and make decisions in my career that utilise some of the attributes and strengths of neurodiversity.

Celebrating individuality

Despite the stereotypes, I'm incredibly adaptable. I've had to be, having spent much of my life working in a different way to my peers. The school system rarely offered the kind of interactive learning I found engaging, although the pandemic has improved this. In my career, my adaptability has made working as a locum much more manageable because I rapidly acclimatise to new practices and learn protocols quickly.

Further help and support

Women and young girls are less likely to be diagnosed with ADHD and/or autism because of the way it manifests. To obtain my diagnosis I sought help from my GP. The waiting times are long so I know of many people using a private healthcare provider. Diagnosis and adjustments are much more accessible if a person is within education, as there are processes and signposting in place to help.

The British Veterinary Chronic Illness Support (BVCIS) has recently formed and, although in its infancy, is helping people across the profession understand what support

My attention to detail and interest in the way things work enable me to look at situations from a different perspective and to problem-solve effectively. This is best utilised in an ICU setting, where we frequently have to think outside the box in a fast-paced environment.

Contrary to common assumptions about ADHD, I thrive on change but am less good with structure; I don't enjoy a rigid schedule. People around me and my team found this difficult to comprehend when I started exploring my neurodiversity. Traditionally, it was assumed that structure was what I needed and that it would keep me on track. However, I find it stifles my creativity and thought process. It comes back to the idea that my brain is wired differently.

'They were on iOS, I was using Android. Different, not less'

I've been fortunate enough to find friends within veterinary nursing who are also neurodivergent and thriving in their careers. They have found niches that play to their strengths and enhance the skill set of their teams – whether that be their attention to detail, their talent for spotting patterns or the ability to problem solve and improvise in the field. Those differences often complement the gaps in other team members' skill sets. The coming together of different minds and thought processes ultimately benefits the team, patients, business and the individuals.

When we nurture talent, we allow the opportunity for great minds to grow and for talent to flourish. By supporting and empowering neurodiversity in the veterinary profession, people like me won't have to walk away from training simply because we feel they don't fit. We don't need to fit into a mould; we are brilliant, talented individuals and should be treated as such.

is available. It's also creating and facilitating networks of support where needed.

The BVNA Chronic Illness campaign was inclusive of neurodiversity, and the tool kit linked to the campaign has a wealth of signposting links in its directory. Visit bvna.org.uk for more information.



Science Shorts

Stay up to date with the latest research




Maintenance energy requirements in cats following controlled weight loss

 Alex German and others, University of Liverpool

As in other species, cats that have lost weight through a controlled dietary plan will often regain weight in the long term. It is believed this may be due to a reduction in the maintenance energy requirement (MER) following weight reduction, but there is no conclusive evidence for this from nutritional trials in this species. The authors investigated the post-weight-reduction energy requirements of 19 client-owned cats. They found that the MER following the period of controlled weight loss fell close to the lower limit of normal MER recommendations for pet cats and so this may predispose them to regaining weight during the maintenance phase.

The Veterinary Journal:
<https://doi.org/10.1016/j.tvjl.2021.105691>

Impact of food toys on owner-perceived quality of life in cats on a weight-loss diet

 Lauren Dodd and others, Virginia-Maryland College of Veterinary Medicine, Blacksburg

Food dispensing toys may have potential benefits when used by cats undergoing a weight control programme, by slowing food consumption, prolonging feeding time, increasing activity and decreasing the time between meals. As owner compliance is important to the success of dieting regimens, the authors investigated the perceptions of owners on the effect of these toys on their pets' quality of life. They found that most owners rated their pets' quality of life higher at the end of the study. Among 48 cats on the dietary trial, 28 could be encouraged to eat vegetables when a palatability additive was used.

Journal of the American Veterinary Medical Association:
<https://doi.org/10.2460/javma.259.8.874>

Effect of intraoperative glove changes on bacterial contamination during surgery

 Deepinder Sidhu and others,
University of Missouri, Columbia


Intraoperative glove changes may be recommended on occasions when there is a disruption in sterile management of the patient or after exposure of a tumour, to avoid seeding cancerous cells. The authors investigated the influence of intraoperative glove

exchange during clean-soft-tissue surgeries and whether gown cuffs become contaminated after wear. Cultures were taken from the gloves and gowns used in 50 procedures. They found that glove exchange did not increase the risk of bacterial contamination and that the outside of the gown cuff does not seem to represent a major source of contamination during clean procedures.

Veterinary Surgery: <https://doi.org/10.1111/vsu.13688>

‘Glove exchange did not increase the risk of bacterial contamination’

Negative effects of pet ownership on owners’ mental health during the Covid-19 crisis


 Andrea Phillipou and others, Swinburne University, Melbourne

Owning a pet has often been associated with improved mental health for owners. The authors investigated whether this claim applied to the owners of cats or dogs during a strict lockdown period enforced by the Victoria state government. Comparisons of 138 pet owners and 125 non-pet owners suggested that having a pet was associated with a poorer quality of life. Contrary to expectations, their data indicate that, in the specific situation of a major disease epidemic, pets may contribute to the increased burden felt by owners and contribute to a poorer quality of life.

Australian Veterinary Journal:
<https://doi.org/10.1111/avj.13102>



Effect of the owner’s presence and scent on stress resilience in cats


 Alexandra Behnke and others,
Oregon State University, Corvallis

The Secure Base Effect refers to the ability of humans and animals to find comfort and relief from stress, as a result of the presence of a caregiver or some other familiar stimulus. The authors investigated the effects of the presence of the owner, or of their scent, for a cat in

an unfamiliar environment. Their findings suggest that the owner’s presence did indeed produce a Secure Base Effect, lowering signs of stress in their cats. However, the presence of an object impregnated with their owner’s scent did not diminish the signs of stress. So the practice of encouraging owners to leave behind a familiar object when a cat goes into a cattery may have no basis in science.

Applied Animal Behaviour Science:
<https://doi.org/10.1016/j.applanim.2021.105444>

Effect of fibre content on the metabolisable energy levels of food given to arthritic dogs

 Zachary Traughber and others,
University of Illinois, Urbana

Accurate measurements of metabolisable energy will be important for the success of weight control programmes in dogs with osteoarthritis. The authors analysed the crude and total dietary fibre content, together with a range of other nutritional parameters, in 51 food products given to client-owned dogs with osteoarthritis. Their findings show that crude fibre is the most variable of the macronutrients in dog food. They conclude that crude fibre is an incomplete and inaccurate measurement of dietary fibre content and its use may lead to variable and inaccurate measurements of metabolisable energy.

American Journal of Veterinary Research:
<https://doi.org/10.2460/ajvr.82.10.787>


Electrical stimulation for nervous system modulation in companion animals

 Angela Martins and others,
Lusófona University, Lisbon

Techniques such as functional electrical stimulation (FES), transcutaneous electrical spinal cord stimulation (TESCS) and transcranial direct current stimulation (TDCS) have been shown to benefit human patients with no deep pain sensation following spinal cord injuries. The authors review the potential applications of these methods in cats and dogs with spinal damage. They suggest that small animal patients can respond to these neurorehabilitation treatments, which may allow some animals to regain an ability to ambulate with only mild proprioceptive deficits.

Acta Veterinaria Scandinavica:
<https://doi.org/10.1186/s13028-021-00585-z>

Use of medicinal leeches in treating upper airway obstruction in a dog


 Nicole Trenholme and others,
University of Missouri, Columbia

Hirudotherapy, or the application of medicinal leeches, has a long history in human medicine. One use during the modern era has been treating respiratory distress caused by trauma-induced macroglossia or lingual haematoma. The authors investigate this technique in treating a 10-month-old neutered female mastiff with acute respiratory distress related to a 10cm soft tissue swelling in the right cervical region. Radiology and cytology revealed this to be sublingual haematoma and tissue oedema. Medicinal leeches were applied to the sublingual and cervical regions and the swelling reduced, allowing the patient to be extubated after 44 hours.

Journal of Veterinary Emergency and Critical Care:
<https://doi.org/10.1111/vec.13094>




Use of hyperbaric oxygen therapy in managing wounds in small animal practice

 Diane Levitan and others,
Long Island University, Brookville, New York

Hyperbaric oxygen therapy is widely used around the world in human medicine but is significantly underutilised in the veterinary sphere. The authors review the underlying science behind this form of therapy and offer advice on its application in small animal practice. They consider that the technique is likely to prove useful in the management of a wide range of injuries, including traumatic wounds, ischaemia-reperfusion injuries, burns, venomous or infected bites, concussive or crush injuries, and surgical graft and flap healing.

Journal of Small Animal Practice:
<https://doi.org/10.1111/jsap.13356>

Role of local emergency services in dealing with incidents involving large animals

 M. Stanley and others,
University of Liverpool

Fire and rescue service personnel are regularly required to attend at emergencies involving horses and other livestock. To date, the only publications that have analysed these events have come from the US and Australia. The authors investigated the frequency and nature of call-outs involving large animals by FRS staff in the north-west of England. Most incidents took place in the summer months and occurred on farmland. A typical emergency would involve animals becoming entrapped and, in most cases, the animals concerned were horses. The details obtained through this analysis may be helpful for both FRS and veterinary staff for rescue incident preparation.

Equine Veterinary Journal 53 (S55), 23
(Presented at conference – no link available)

Influence of musical preferences and intraoperative questions on suturing speed

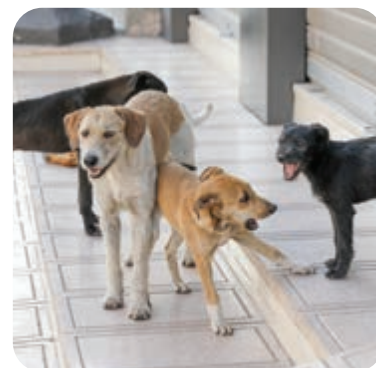


 Jennifer Peterson and others,
Purdue University, West Lafayette, Indiana

Background music is known to have both beneficial and detrimental effects on a surgeon's performance in the operating theatre. Some studies have shown it can be relaxing for surgical staff, but other evidence suggests that it may also be a distraction. The authors investigated the effects of both music and being asked questions unrelated to the surgical procedure on the speed that surgeons performed a standard suturing procedure. They found that music favoured by the surgeon reduced the times needed for closure while being asked questions tended to slow down the suturing process. These influences were more pronounced during tasks carried out by an inexperienced surgeon.

Veterinary Surgery: <https://doi.org/10.1111/vsu.13733>

Daily activity patterns in four populations of domestic dogs



 Silja Griss and others,
University of Berne

Free-roaming domestic dogs constitute the majority of the canine population around the world but many aspects of the ecology of these animals are still unclear. The authors collected data on the daily activity patterns of four different groups of dogs in Guatemala, Indonesia, and both farm dogs and family pets in Switzerland. The three free-ranging groups of dogs showed diurnal peaks of activity in the early morning and late afternoon while the activity of the family pets was much more dependent on their owners' daily routines. The pet dogs spent more time resting and less time undergoing moderate activity than the others, and also spent more time carrying out vigorous activities.

Applied Animal Behaviour Science:
<https://doi.org/10.1016/j.applanim.2021.105449>

Trust in the vet-client relationship



Staci Baldwin

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Staci qualified as an RVN in January 2015, having been in practice since 2010. She has experience in first-opinion practices and as a locum nurse in bigger hospitals, and has always been involved in client-facing activities, including reception and consultations.

Staci joined VCMS in July 2019. She's a serial problem-solver and the person to whom people turn for advice. She believes nurses sit between clients and vets, giving valuable insights into both, and that strong trusting relationships are key to high-quality care and customer service.



OVERVIEW Following a euthanasia appointment that caused undue distress to a client, a practice was faced with a complaint which questioned the efficiency and sensitivity of its procedures.

While the incident, naturally, produced a range of heightened emotions, the client and practice were able to resolve the dispute by engaging with, and successfully completing, the mediation process.

Background

After arriving for an appointment to have their dog euthanised, an owner was kept waiting with their pet on a bench outside the surgery for almost half an hour. Following this delay, the owner spent an additional 15 minutes in the treatment room, only for the vet to arrive without the paperwork and equipment necessary to complete the procedure.



After acquiring the equipment from another member of staff, the vet euthanised the dog in the presence of a nurse. All the formal checks for a heartbeat and pupil dilation were then carried out before the dog was officially pronounced dead. Following the completion of the euthanasia process, the owner took their dog to the crematorium.

‘The mediation process revealed the importance of managing complaints in a way that is people-centred’

Upon arriving at the crematorium, however, the dog began to breathe when being lifted out of the vehicle, so the vet had to travel to the crematorium to carry out the procedure for a second time before the owner was able to put their pet to rest. In addition to the distress caused by this situation, an invoice was later sent to the client for the full cost of the euthanasia process.

Pet owner’s complaint

Naturally, this series of events had a profoundly upsetting effect on the owner. They were made to wait with a collapsed and compromised dog which was then incorrectly pronounced dead, so it’s not difficult to imagine why a dispute emerged.

When raising the complaint against the practice, the owner wanted to know why their dog was not weighed to ensure the correct dosage was administered, and how the vet had failed to satisfactorily perform the post-euthanasia checks. Understandably, the owner also found it insensitive to receive an invoice just days after the incident.

Practice’s perspective

When responding to the owner’s complaint, the practice accepted that, while the prolonged wait was distressing, it was sadly unavoidable due to staff shortages. They also investigated the dosage and reported that the correct amount was administered,

as per the recommendations of the Veterinary Defence Society (VDS). In regard to the weighing of the dog, they explained that, as the scales were in the waiting room, an estimate was used from the details acquired from a previous examination of the dog.

The investigation also revealed that the post-euthanasia checks were performed correctly and that there was no known reason for the dog to begin breathing, only speculation as to what could have led to this happening. Finally, the practice apologised for the miscommunication between their internal team and the accounts department, which worked remotely and was therefore unaware of the complications involved in this process.

Reaching a resolution

In order to reach a mutually satisfactory resolution, the practice waived the entire euthanasia bill. They agreed it was highly insensitive to have sent an invoice, and that this was entirely their fault for failing to communicate with their various departments.

The team also sent a letter that expressed genuine sympathy for the sadness caused by the entire process, and made assurances that procedures and processes were under review to avoid other pet owners having the same experience.

Specifically, they explained how new protocols were being established to ensure that vets would always have the correct paperwork and equipment to hand when arriving for a euthanasia appointment. Recognising how difficult this kind of appointment is for owners, the practice described how they would prioritise such appointments to reduce unnecessary waiting time.

Assurances were also made regarding the communication with the accounts department in the event of a complicated incident. Though far from comparable to the feelings of the owner, the practice also emphasised that the situation had had a lasting impact on the nurse and vet involved.

This element of the mediation ultimately helped illustrate that at the heart of this complication were people who truly wanted the best for the animal. The mediation process revealed the importance of learning lessons, as well as managing complaints in a people-centred way, recognising the emotions of all those involved in procedures concerning pets.

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1. Harris interactive. Understanding the usages & attitudes around cats & dogs sterilization and evaluating the potential of Suprelorin. (2017).

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The Science of Canine Castration

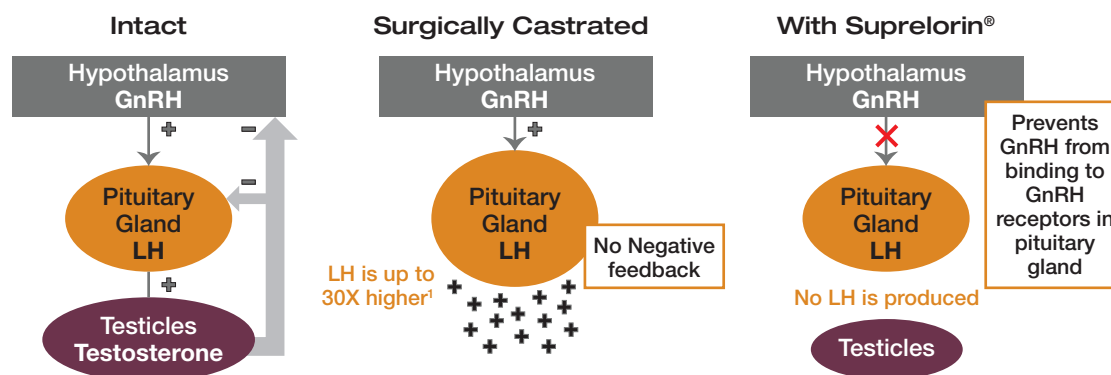


**Dr Michelle Kutzler MBA, DVM, PhD,
DACT Professor of Theriogenology**

Canine castration is one of the most important decisions an owner can make regarding their pet's health. As well as preventing unintended mating, castration can be beneficial in preventing specific testosterone-related diseases and can help in the management of some behavioural issues.

Surgical castration can offer benefits such as permanent sterilisation, elimination of the risk of testicular cancer and benign prostatic hyperplasia and may decrease urine marking and male reproductive behaviours. It must be noted that surgery does carry an inherent risk associated with anaesthesia and management of the surgical wound is also required.

The impact of surgical castration is increased circulating Luteinising Hormone (LH) concentrations. In dogs, the hypothalamus secretes gonadotropin-releasing hormone (GnRH), which stimulates the anterior pituitary gland to release of LH. In reproductively intact (uncastrated) dogs, LH stimulates the secretion of testosterone, which negatively feedbacks to decrease LH secretion. However, in the surgically-castrated dog, there is no negative feedback, which results in significantly elevated LH concentrations¹. Tissues with LH receptors (brain, gastrointestinal tract, adrenal glands, thyroid, pancreas, skin, bladder, hip and knee joints, lymphocytes, eye, spleen) can be negatively affected by the sustained LH concentration in castrated dogs.



SUPRELORIN® is the only licensed medical GnRH agonist for use in male dogs. It is easy to administer and is highly effective in inducing temporary infertility. Most importantly, medical castration with SUPRELORIN® does not increase LH concentrations so it is not associated with the long-term health problems which may be associated with surgical castration¹.

For owners interested in keeping their dogs as healthy as possible, medical castration with SUPRELORIN® should be considered.

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<https://bit.ly/suprelorin>

“ I thoroughly enjoyed the webinar series as an up-to-date view of castration and alternatives available to ensure owners can make an informed decision. ”

CHARLOTTE BOWLING

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1. Kutzler MA. Possible Relationship between Long-Term Adverse Health Effects of Gonad-Removing Surgical Sterilization and Luteinizing Hormone in Dogs. *Animals*. 2020; 10(4):599. <https://doi.org/10.3390/ani10040599>

Shaping the future
of animal health



10

Rockefeller habits



The business guru's century-old business strategies have surprising relevance for the running of a contemporary veterinary practice.

John D Rockefeller was, at one time, the richest person in the United States. A controversial figure, he was also a philanthropist who donated money to education, science and the arts. He's still referenced for his iconic 'Rockefeller habits' which are as pertinent today as they were a century ago.



1 The executive team is healthy and aligned.

Practice managers are united in their aims and values, respect each other's differences, and are up to date in their training. They meet regularly to consolidate, exchange ideas and resolve conflicts.

2 Everyone is aligned with the one thing that needs to be accomplished to move the company forward. A measurable and achievable quarterly goal is identified and shared with everybody in the practice, so everyone can understand exactly how and why they can contribute.

3 Communication rhythm is established and information moves through the organisation quickly. Regular meetings (e.g. daily catch-ups, weekly team meetings, monthly middle-management meetings and quarterly off-site senior-management meetings) take place and the resulting information is shared with others.

4 Every facet of the organisation has a person assigned with accountability for ensuring goals are met. Team members know if, how and why they are responsible and to whom – and the impact of failing to meet their responsibilities.

5 Ongoing employee output is collected to identify obstacles and opportunities. Managers assess and engage with team members regularly to understand positive or negative experiences that may be contributing to their performance. They then learn from, and act on, those findings.

6 Reporting and analysis of customer feedback data is as frequent and accurate as financial data. Key team members regularly and proactively seek feedback from practice customers. Both positive and negative insights are shared with the team, acted upon, and followed-up with customers if necessary.

7 Core values and purpose are alive in the organisation. The core values and purpose are known, shared and willingly upheld by the whole team, and form an active part of daily practice life.

8 Employees can articulate the key components of the company's strategy accurately. The practice strategy clearly identifies what it does, its key team and ethos, its customer profile, its aims and priorities, its mission, and its promises to customers. It is prominently displayed and regularly reinforced.

9 All employees can answer quantitatively whether they have had a good day or week. Key performance indicators (KPIs) are established with each team member, detailing clear expectations and accountability. Managers provide regular evaluation, feedback, guidance and support based on these indicators.

10 The company's plans and performance are visible to everyone. Practice performance and team members' KPI data are measurable and accessible, with overt and structured action taken for meaningful accountability and encouragement.

Are there other good habits you feel could be implemented in veterinary practice? Let us know – email vnj@bvna.co.uk

Bilateral ureteral obstruction and subcutaneous ureteral bypasses: a feline case report

Part 1 DOI 10.1080/17415349.2021.1944414

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Chelsey holds a Zoo Biology BSc (Hons) degree, has been in practice since 2014, qualified as an RVN in 2020 and started the Vets Now Cert VN ECC course in 2021. Having spent the first few years in general practice, Chelsey transitioned to an Internal Medicine nursing role soon after qualifying, while continuing to locum in emergency and referral practices. Her key areas of interest encompass critical care nursing and medicine diagnostics.



ABSTRACT Bilateral ureteral obstruction in felines is relatively uncommon, with subsequent placement of bilateral subcutaneous ureteral bypasses even more uncommon for veterinary nurses to encounter in practice. This case report covers the presentation, diagnostics, treatment, nursing care, complications and ongoing outpatient care of Kolo, a two-year-old ragdoll, who presented with this condition and ultimately required surgical intervention for a successful outcome. Part 1 encompasses the patient's journey from admission to hospitalised recovery. A glossary of terms can be found at the end of Part 1.

Key words renal, feline medicine, surgery, nursing care, intensive care, case study, ureteral

Introduction

Renal disease is relatively common in cats and can be divided into two entities: chronic kidney disease (CKD) and acute kidney injury (AKI). The key difference between the two is the rate of disease progression (Segev, 2018). Aetiology of AKI often involves toxic,

ischaemic or infectious components (Aldridge & O'Dwyer, 2013). Ureteral obstruction can also cause AKI, with ureteral calculi being the most common cause of obstruction and calcium oxalate comprising 98% of ureterolithiasis in cats (Hardie & Kyles, 2004; Kyles et al., 2005).

Ureteral obstructions are an emergency and require immediate care. Consensus statements of The American College of Veterinary Internal Medicine (ACVIM) advise that medical management is rarely effective for the treatment of obstructive ureterolithiasis, and management should be achieved through surgical interventions such as ureteral stenting or subcutaneous ureteral bypass (SUB™) (Lulich et al., 2016).

Ureteral stenting is the placement of a small tube within the ureter(s) that enables passive ureteral dilation, prevents stricture formation and resolves obstruction (Wormser et al., 2016). However, the small diameter of the ureteral lumen in cats presents challenges for stent placement (Kulendra et al., 2021). Eliminating this challenge, the SUB™ system was first produced by Norfolk Vet Products in 2009. It has since been redesigned and advanced repeatedly in response to

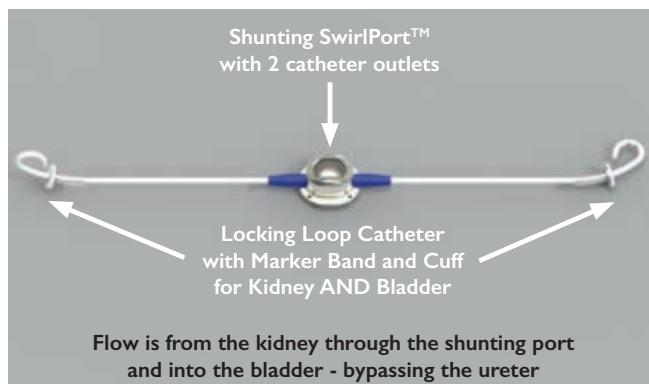


Figure 1. Subcutaneous Ureteral Bypass (SUB™) 2.0 device developed by Norfolk Vet Products (Norfolk Vet Products, 2018a).

reported complications. The key components of the SUB™ system include a nephrostomy catheter placed in the kidney, a SwirlPort™ placed subcutaneously and a cystostomy catheter placed in the bladder (Figure 1) (Norfolk Vet Products, 2018a). The catheters remain internal within the abdomen and, whilst the subcutaneous SwirlPort™ remains beneath the skin, it is palpable externally. Fundamentally, the SUB™ device is a permanent fixture that becomes an artificial ureter. Without complications, the patient’s urinary system can function as normal without assistance. However, there is some maintenance required which is the key purpose of the SwirlPort™. This will be discussed in Part 2 of this case report.

Initial presentation

Kolo, a two-year-old female neutered ragdoll (Figure 2) presented with lethargy, inappetence and vomiting, over a 48-hour period.

Physical exam findings demonstrated in Table 1.

Table 1. Physical findings of the patient at time of admission.

Assessment	Findings
Demeanour	Depressed mentation, lateral recumbency but responsive, lip licking
Mucous membranes	Pale pink, with capillary refill time of two seconds
Chest auscultation	No abnormalities detected
Heart rate	Bradycardia of 150 bpm. Pulses synchronous
Electrocardiogram	Trace absent of P wave. QRS complexes normal
Temperature	Normothermia of 38 °C
Pain	Pain detected upon palpation of kidneys

Treatment, investigations and diagnostics

Veterinary nurses have a participating role in assisting and implementing investigations, diagnostics and treatment under the veterinary surgeon’s direction.

An intravenous catheter was placed in the right cephalic vein and a blood sample obtained. In-house blood analysis was carried out including biochemistry, haematology and venous blood gas analysis (EPOC) (Table 2). Severe azotaemia and moderate hyperkalaemia were identified, consistent with AKI. The International Renal Interest Society (IRIS) AKI grading criteria categorises a blood creatinine value of more than 880 µmol/L at the highest, grade 5 (Cowgill, 2016). The patient’s first blood creatinine value presented at 1326 µmol/L, indicating the severity of AKI.

Intravenous fluid therapy (IVFT) was commenced at a rate of twice maintenance, and medication of buprenorphine, maropitant, omeprazole and calcium gluconate were administered. Due to concerns regarding no improvement overnight and a guarded prognosis, emergency referral to an internal medicine department was offered and accepted.



Figure 2. Photograph of Kolo.

Table 2. Partial Results of Blood Analysis (EPOC). Measurements: CREA, (Creatinine) umol/L. UREA mmol/L. Na+ (Sodium) mmol/L. Ca++ (Ionised calcium) mmol/L. GLU (Glucose) mmol/L. WNL: within normal limits.

DATE	TIME	CREA	UREA	pH	Na+	Ca++	GLU
29.01.21	2043	1326 - HIGH	42.8 HIGH	7.09 - LOW	141 - LOW	0.94 - LOW	6.5 - WNL
30.01.21	0404	1326 - HIGH	42.8 HIGH	7.04 - LOW	137 - LOW	0.96 - LOW	6.2 - WNL
30.01.21	1038	1326 - HIGH	42.8 HIGH	7.13 - LOW	137 - LOW	1.14 - LOW	5.9 - WNL
30.01.21	1633	1326 - HIGH	42.8 HIGH	7.12 - LOW	139 - LOW	1.6 - HIGH	6.4 - WNL
31.01.21	1641	411 - HIGH	28.7 HIGH	7.15 - LOW	166 - HIGH	1.57 - HIGH	8.4 - HIGH
31.01.21	2140	330 - HIGH	27 HIGH	7.16 - LOW	165 - HIGH	1.54 - HIGH	7.3 - HIGH
01.02.21	0709	235 - HIGH	21.2 HIGH	7.2 - LOW	162 - WNL	1.36 - HIGH	6.9 - WNL
01.02.21	1746	169 - WNL	17 HIGH	7.2 - LOW	157 - WNL	1.33 - HIGH	6.6 - WNL
02.02.21	1040	132 - WNL	11.6 - WNL	7.3 - WNL	152 - WNL	1.31 - WNL	5.6 - WNL
03.02.21	0947	152 - WNL	10.2 - WNL	7.28 - WNL	156 - WNL	1.36 - HIGH	6.1 - WNL
04.02.21	0913	121 - WNL	8 - WNL	7.39 - WNL	154 - WNL	1.32 - WNL	5.7 - WNL
05.02.21	1438	130 - WNL	7.2 - WNL	7.44 HIGH	153 - WNL	1.23 - WNL	7.7 - HIGH
06.02.21	1151	103 - WNL	7.1 - WNL	7.42 HIGH	153 - WNL	1.27 - WNL	5.2 - WNL
07.02.21	1116	127 - WNL	5.7 - WNL	7.42 HIGH	154 - WNL	1.36 - HIGH	5.7 - WNL
08.02.21	0939	114 - WNL	7.3 - WNL	7.39 - WNL	154 - WNL	1.36 - HIGH	5.3 - WNL
09.02.21	0914	127 - WNL	9.6 - WNL	7.38 - WNL	154 - WNL	1.35 - HIGH	5.2 - WNL
18.02.21	0951	181 - WNL	11.4 - WNL	7.35 - WNL	150 - WNL	1.32 - WNL	5.7 - WNL
03.03.21	1334	117 - WNL	9.7 - WNL	7.41 - WNL	153 - WNL	1.27 - WNL	6.5 - WNL
04.05.21	0939	95 - WNL	8.5 - WNL	7.33 - WNL	152 - WNL	1.31 - WNL	6.8 - WNL

Following examination, the patient had a sedation plan created and administered. Abdominal ultrasound was performed. Key findings included pyelectasis, three ureteroliths measuring 1.0 mm, 0.7 mm and 1.2 mm in the distal aspect of the left ureter and one ureterolith measuring 1.7 mm in the distal aspect of the right ureter. Distally to the locations of the ureteroliths, both ureters were not dilating. The bladder was empty and poorly recognisable. All of which were consistent with bilateral ureteral obstruction. Subtle bilateral parenchymal renal changes were identified and therefore underlying CKD could not be excluded. Due to the critical state of the patient and the unlikelihood that the patient could be stabilised with medical management, emergency surgical intervention of bilateral SUB™ placement was required for resolution.

Anaesthesia and surgery

Transition from sedation to general anaesthesia was planned and implemented. Due to the severe biochemical disturbances and compromised nature of the patient's condition, an American Society of Anaesthesiologists (ASA) physical status score of 4 was allocated, thereby considered high risk (AVTAA, 2013)(Table 3).

Placement of the two SUB™s was achieved with open abdominal surgery, fluoroscopy guidance and modified Seldinger techniques. Nephrostomy catheters were placed first in both kidneys. Pyelocentesis samples were extracted for culture and sensitivity testing and a pyelogram performed to ensure appropriate patency and location of these catheters. The cystotomy catheters were then placed in the bladder. Bilateral abdominal incisions enabled attachment of the SwirlPort™s subcutaneously and were sutured to the

abdominal wall. The systems were finally flushed to leak test and check patency before closing the abdomen. Visualisation of the same model of SUB™ device prior to placement can be seen in Figure 1. Radiographs of the SUB™ device in situ can be seen in Figures 3 and 4. A naso-oesophageal feeding tube was placed due to anticipated inappetence associated with kidney disease, and radiographs taken to confirm placement.

Recovery and nursing considerations

POST-OPERATIVE HOSPITALISATION

Once extubated, recovery was monitored continuously in the intensive care unit (ICU) using a multiparameter monitor including an ECG, pulse oximetry, oscillometric blood pressure and temperature probe. Readings were recorded every 15 minutes once parameters considered stable. At each recording, heart rate was auscultated and pulse rate and quality palpated. Once the patient was responsive and moving, checks and recordings were performed hourly. Recovery was considered smooth and stable, excluding the complication of hypothermia which was rectified using a Bair Hugger™. After 24 hours, checks were reduced to TID.

IVFT (twice maintenance) and ketamine constant rate infusion (CRI)(10 mcg/kg/min) were continued for approximately six hours post-operatively. The ketamine CRI was then reduced (5 mcg/kg/min) for a further six hours, while potassium chloride (KCl) supplementation (40 mmol/L at maintenance rate) was introduced. Approximately 12 hours following surgery, the patient continued with twice maintenance IVFT and KCl supplementation. It should be noted that during ketamine CRI's, frequent corneal lubrication (q4h allocated to this patient) is important. When the

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1. Schnyder M, et al., Vet Parasitol. 2009;166(3-4):326-332. Advocate contains imidacloprid and moxidectin and is indicated for use in cats, ferrets and dogs suffering from, or at risk from, mixed parasitic infections. Legal category **POM-VI** (UK) **POM** (IE). Refer to the product packaging and leaflets for information about side effects, precautions, warnings and contraindications. Further information is available from the Summary of Product Characteristics or the datasheet at www.noahcompendium.co.uk. For further information call Elanco Animal Health on +44(0)1256353131 or write to: Elanco Animal Health, Form 2, Bartley Wood Business Park, Hook, RG27 9XA, United Kingdom. Advice should be sought from the medicine prescriber prior to use.

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Table 3. American Society of Anaesthesiologists (ASA) Physical Status Scores. Adapted from (AVTAA, 2013).

ASA Score	Classification	Level of risk
I	Normal healthy animal. No underlying disease.	Minimal
II	Minor disease process present. Mild systemic disturbances that individual can compensate for. Neonates, geriatrics, obesity.	Slight
III	Moderate systemic disease present. Clinical signs present. Moderate anaemia, moderate dehydration, pyrexia, low grade heart murmur or cardiac disease.	Moderate
IV	Significantly compromised by disease. Constant threat to life. Severe dehydration, shock, uraemia, toxoemia, severe pyrexia, uncompensated heart disease, uncompensated diabetes, pulmonary disease, emaciation.	High
V	Moribund. Surgery usually required as final attempt to preserve life. Advanced heart, renal, liver or endocrine disease. Profound shock, severe trauma, pulmonary embolus, terminal malignancy.	Extreme

patient was transferred from ICU to cat ward, KCl supplementation was discontinued and IVFT reduced from twice maintenance to maintenance on day five post-surgery.

The patient was continued on methadone (0.2 mg/kg q4h), maropitant (1 mg/kg SID), cefuroxime (20 mg/kg q8h) and omeprazole (1 mg/kg BID) immediately after surgery. Pain scoring before each methadone administration was performed using the Glasgow Composite Measure Pain Scale for cats (CMPS-Feline). If a score of more than five was allocated, then a methadone "top up" of 0.1 mg/kg could be added, totalling the dose to 0.3 mg/kg. However, the patient was consistently scored at five or below. The patient was transitioned from methadone to buprenorphine (0.015 mg/kg q8h) on day three post-surgery. On day four, analgesia and omeprazole were discontinued. Pain scoring q4h was discontinued on

day five as the patient demonstrated consistent comfort without analgesia. Maropitant and cefuroxime were discontinued the day before discharge. In total, the patient spent 12 days hospitalised.

ONGOING BLOOD GAS ANALYSIS MONITORING

Blood gas analysis was repeated twice daily in the 48 hours post-surgery. As seen in Table 1, the patient's blood creatinine returned to within normal parameters within 48 hours, and their blood urea nitrogen within 72 hours, of surgery. Thereafter, analysis was repeated daily until discharge.



Figure 3. Dorsoventral radiograph of patient following SUB™ placement. Intellectual property of Pride Veterinary Centre.

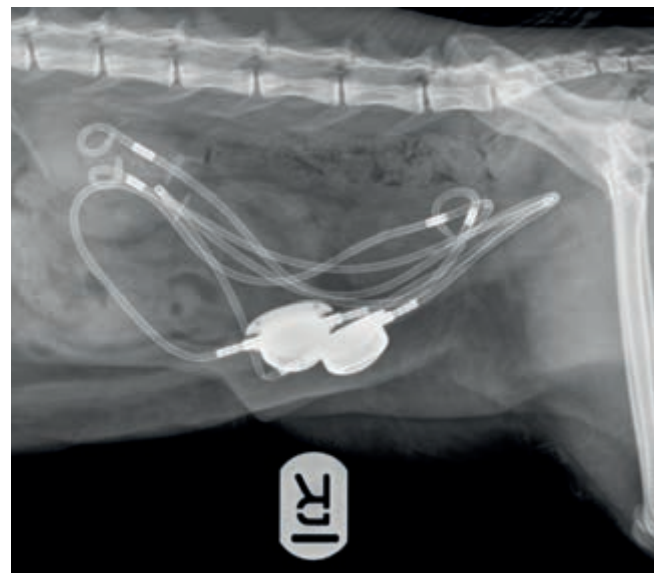


Figure 4. Right lateral radiograph of patient following SUB™ placement. Intellectual property of Pride Veterinary Centre.

NUTRITION AND OESOPHAGSTOMY FEEDING TUBE PLACEMENT

Nutritional requirement is an essential nursing consideration and is often challenging in critical and renal patients. An ideal diet has not yet been validated for AKI patients. However, there has been suggestion that diets suitable for CKD patients would also be suitable for AKI patients (Haskey, 2019). Such diets comprise of moderate protein and potassium, and low phosphate. However, with ultrasound findings being inconclusive of the presence of CKD in this case, such a diet could be considered unsuitable. Recommendations vary in AKI cases, with some advising reduced protein to reduce uraemic signs, and others advising increased protein to improve renal recovery (Francey, 2015). Ultimately, there has been insufficient evidence-based investigations, and therefore anecdotal accounts and pathophysiological justifications are to be relied on. With relevance to the case study, in-hospital nutrition primarily focused on tissue repair and renal recovery.

Inappetence and nausea are common consequences of uraemia. Therefore, many CKD and AKI patients will present with these clinical signs. On occasion, resolution of uraemia does not follow with an improved appetite. Reasoning for this is often attributed to learned food aversion. Learned food aversion occurs when the patient associates a negative physical manifestation such as nausea or pain with food as an acquired defence mechanism (Quimby, 2013).

In the discussed case, the patient continued to demonstrate inappetence throughout hospitalisation, despite resolution of uraemia seen in Table 2. Only during the last three days of hospitalisation did the patient eat very small amounts of dry biscuits and wet pouches intermittently. It could be suggested that there was a link to learned food aversion. A naso-oesophageal feeding tube was placed at the time of surgery but unfortunately was displaced two days after. Due to the SUB's requiring flushing five days post-surgery, it was opted that an oesophagostomy tube be placed at the same time to provide enteral nutrition and enable ongoing nutritional support after discharge if required.

Upon reflection, the prevalence of inappetence and food aversion in cats with renal disease may warrant placement of an oesophagostomy tube at the time of surgery in similar cases. A catabolic state is unsuitable for tissue repair and renal recovery. Thus, delay in providing a feeding tube could be considered detrimental. Furthermore, an oesophagostomy tube, as opposed to naso-gastric or naso-oesophageal tubes, may prove more suitable in reducing the requirement of another general anaesthetic and the potential need of ongoing nutritional support long term and at home.

CALORIE REQUIREMENT CALCULATIONS

Following placement of the oesophagostomy tube, a feeding plan was implemented. Resting Energy Requirement (RER) for the patient was calculated using a calculation appropriate for patients weighing >2kg:

$$\text{RER in kcal} = (\text{Body weight in kg} \times 30) + 70$$

Due to more than three days of inappetence, the patient was started on $\frac{1}{3}$ of the Resting Energy Requirement (RER) for the first 24-hour period, divided into five individual feeds comprising of Royal Canin recovery liquid diet. During the following 24-hour period, $\frac{2}{3}$ of the RER was met and thereafter the full RER. The plan was in line with current recommendations of calculating RER and starting with $\frac{1}{3}$ of the requirement. However, there is discussion regarding whether the incremental increases should be performed every 12 or 24 hours. It is important to consider that nutritional support for a critically ill patient is to achieve maintenance of homeostasis and not necessarily weight gain (Carlson, 2018). The patient's weight reduced slightly during hospitalisation, having been 3.7kg at admit and 3.5kg at discharge.

Some recommendations encompass an illness factor into the calculation by multiplying the RER by a factor of between 1.1 and 2, to increase the requirement to meet higher demands. However, findings utilising indirect calorimetry methods in dogs demonstrated that the conservative approach of calculating RER was more appropriate for critically ill and post-operative patients than the more generous illness factor inclusion (Chan & Freeman, 2006; Walton et al., 1996).

Summary

Part 1 has reported the case study from admission to surgery and throughout hospitalisation. Part 2 reports from discharge to ongoing outpatient care which requires life-long commitment.

Reflective professional development notes. To access hyperlinks to the references, scan the QR code on page 3.

Acknowledgements

This article was enabled through the kind consent of Kolo's committed owner and the treating practice Pride Veterinary Centre. Gratitude to the primary clinicians overseeing Kolo's case: Jessica Adamany BSc DVM DipECVIM-CA MRCVS, Specialist of Internal Medicine who spent time proofreading this article and answering many questions, and Rosario Vallefuoco DVM DipECVMS MRCVS Specialist of Small Animal Surgery. Furthermore, the number of staff involved in Kolo's care from the beginning, whether directly or indirectly, is unquantifiable but to everyone at Pride: thank you.

Definitions

Azotaemia Elevation of nitrogenous products such as blood urea nitrogen (BUN) and creatinine levels

BID Twice daily

Centesis Prefix for the act of puncturing a body cavity or organ to withdraw fluid

Cystitis Inflammation of the urinary bladder

Fluoroscopy Imaging technique that utilises continuous x-ray beams to provide real-time moving imaging

Homeostasis Self-regulation to provide internal equilibrium of physiological processes

Hyperkalaemia Elevated potassium levels in the blood

Paranchymel Relating to the functional tissue of an organ

Pyelectasis Dilation of the renal pelvis

Pyelo Prefix for renal pelvis

Pyelocentesis Withdrawing fluid from the renal pelvis utilising a needle

Pyelogram Imaging of the renal pelvis, usually utilising contrast

Q4h Every four hours

SID Once daily

TID Three times daily

Uraemia Elevated urea in the blood

Ureter Anatomical tube that carries urine from the kidneys to the urinary bladder

Ureterolith A stone or calculus in the ureter

Ureterolithiasis The concept of stones in the ureter

Urethra Anatomical duct that transfers urine from the urinary bladder to the exterior of the body

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Bilateral ureteral obstruction and subcutaneous ureteral bypasses: a feline case report

Part 2 DOI 10.1080/17415349.2021.1944415

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ABSTRACT Bilateral ureteral obstruction in felines is relatively uncommon, with subsequent placement of bilateral subcutaneous ureteral bypasses even more uncommon for veterinary nurses to encounter in practice. This case report covers the presentation, diagnostics, treatment, nursing care, complications and ongoing outpatient care of Kolo, a two-year-old ragdoll, who presented with this condition and ultimately required surgical intervention for a successful outcome. Part 2 encompasses the patient's journey following discharge, including oesophagostomy feeding tube demonstration and home care, repeat blood tests, life-long SUB™ flush procedures, dietary considerations, complications and management. A glossary of terms can be found at the end of Part 1.

Key words outpatient; renal; feline medicine; oesophagostomy; nursing care; case study

Introduction

Part 1 introduced the case report of Kolo, a two-year-old female neutered ragdoll who presented with bilateral ureteral stones and severe azotaemia. Surgical intervention of bilateral subcutaneous ureteral bypass (SUB™) placement was performed and the patient's azotaemia resolved. Part 2 focuses on the outpatient care of Kolo from discharge and the life-long monitoring and maintenance required.

Subcutaneous ureteral bypass: a recap

A single SUB™ system consists of three key components: a nephrostomy catheter, a SwirlPort™,

and a cystostomy catheter (Norfolk Vet Products, 2018a). Part 1 of the case report includes an image of a SUB™ device prior to surgical placement. Figure 1 consists of an illustrative diagram of a SUB™ device in situ. Fundamentally, these combine as one permanent fixture to function as an artificial indwelling ureter. Without complications, the patient's urinary system can continue to function as normal without assistance. However, a form of maintenance is required throughout the rest of the patient's life, which will be discussed in this article.

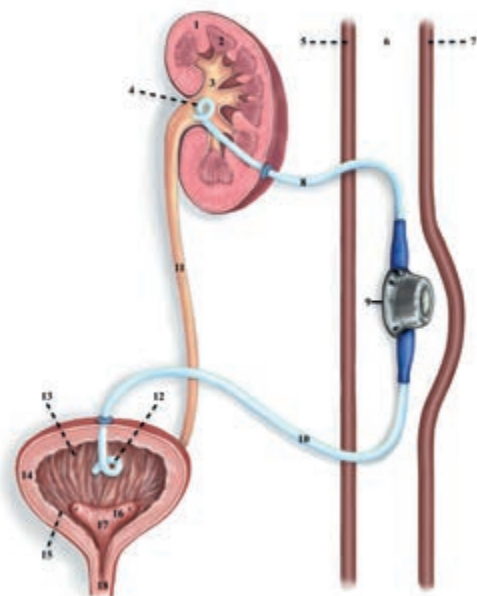


Figure 1. Educational illustration by, and courtesy of, Kirsty Kinnear (www.kirstykinneardart.com). 1. Renal cortex, 2. Renal medulla, 3. Renal pelvis, 4. Pigtail tip, 5. Abdominal wall, 6. Subcutaneous space, 7. Skin, 8. Nephrostomy catheter, 9. Swirlport™, 10. Cystostomy catheter, 11. Ureter, 12. Pigtail tip, 13. Urinary bladder apex, 14. Detrusor muscle, 15. Mucosa/Rugae, 16. Ureter orifices, 17. Trigone, 18. Urethra.

Discharge and outpatient care

LONG-TERM OUTPATIENT CARE: BLOODS AND SUB™ FLUSH PROCEDURES

Ongoing monitoring of renal values and maintenance of the SUB™s is critical to the patient's long-term survival and quality of life.

Maintenance of the SUB™s is achieved via a flushing procedure of the SUB™ device. The patient required sedation, was positioned in dorsal recumbency and an ultrasound was performed. The renal pelvis was measured and recorded prior to flushing. The SwirlPort™s were palpable beneath the skin. The hair was clipped and prepped aseptically to the same standard as surgery requirements, with consideration that the SwirlPort™s were the core sites of entry. Norfolk Vet Products provide a sterile flush kit specifically to perform the SUB™ flush procedure, all items of which consist of a luer lock system (Figure 2).

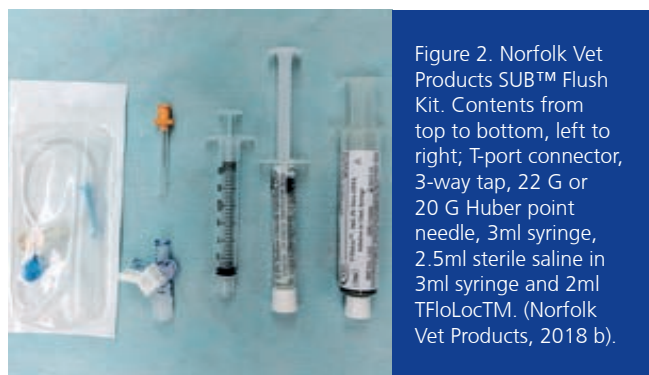


Figure 2. Norfolk Vet Products SUB™ Flush Kit. Contents from top to bottom, left to right; T-port connector, 3-way tap, 22 G or 20 G Huber point needle, 3ml syringe, 2.5ml sterile saline in 3ml syringe and 2ml TFloLoc™. (Norfolk Vet Products, 2018 b).

The veterinary surgeon performing the procedure open gloved with an aseptic technique and unpacked the flush kit onto a sterile drape. The following is attached in order: Huber point needle to the T-port connector and then to the 3-way tap. The 3ml syringe and sterile saline syringe are each attached to the 3-way tap.

The silicone insertion site within the SwirlPort™ was palpated and the Huber point needle was advanced perpendicularly through the skin and silicone until resistance felt when metal reached (Figures 3 and 4). The 3ml syringe was then drawn back to obtain a urine sample for urinalysis, culture and sensitivity.

The ultrasound then located the renal pelvis. The 3-way tap was twisted to occlude the urine sample syringe and enable the sterile saline to be flushed through. The presence of small bubbles in the renal pelvis confirmed that the saline had entered, thereby confirming appropriate placement and patency of the nephrostomy catheter. The saline was then drawn back into the same syringe. The ultrasound then located the bladder, and the saline was flushed again. Bubbles were present in the bladder, confirming saline entering and therefore appropriate placement and patency of the cystostomy catheter.

With patency confirmed, the urine sample syringe was removed from the 3-way tap and the T-FloLoc™ syringe was attached. T-FloLoc™ contains a 2% tetrasodium ethylenediaminetetraacetic (tetra-EDTA) solution. The 3-way tap was twisted to occlude the saline syringe, and enable the T-FloLoc™ syringe to be flushed slowly in pulses, while the ultrasound monitored the renal pelvis for overdistension. The T-FloLoc™ solution is not drawn back, but remains in the device for the purpose of maintaining patency and infection control (Table 1) (Norfolk Vet Products, 2018b). Once completed, the process was repeated on the other side with a new sterile flush kit.

It is worth noting that the SwirlPort™ was allocated to the diagonal kidney, for example the left SwirlPort™ was connected to the right kidney, and that this technique of flushing is for prophylactic purposes only. Findings have also demonstrated that 2% tetra-EDTA infusions can resolve mineral occlusions of SUB™ devices, preventing the need to replace the system (Chik et al., 2019).

In this case, the frequency of SUB™ flushing was performed at five days and 20 days following placement. No complications were reported during these procedures, and therefore the next procedure will be performed at three months if no complications arise in the meantime. Thereafter, the frequency of SUB™ flushing will reduce to every three to six months, depending on the patient.

Blood tests will be repeated, depending on the progression or deterioration of the patient. They will be repeated at each SUB™ flush procedure, increasing frequency if indicated.

OESOPHAGOSTOMY TUBE SUPPORT

Due to the patient's ongoing inappetence but improving renal parameters, it was opted to discharge with the oesophagostomy tube in place. Upon discharge, a nurse discussed and demonstrated how to administer tube feeds, maintain the tube and perform dressing changes. A 'feeding-kit' box was given to the owner with all the necessary consumables to complete these tasks.

To aid clear communication, the box also included written step-by-step instructions and a feeding chart to help the owner monitor the patient's intake. Furthermore, the practice had a pre-recorded video of the demonstrations which was emailed to the owner, while ongoing phone communications with both vets and nurses were frequent. This enabled multiple forms of communication to be available and allowed the owner to reflect and recap following discharge, with means of communication to resolve any issues or queries post-discharge. Overall, the combined methods of communication were considered thorough and successful in supporting the client and outcome for the patient.

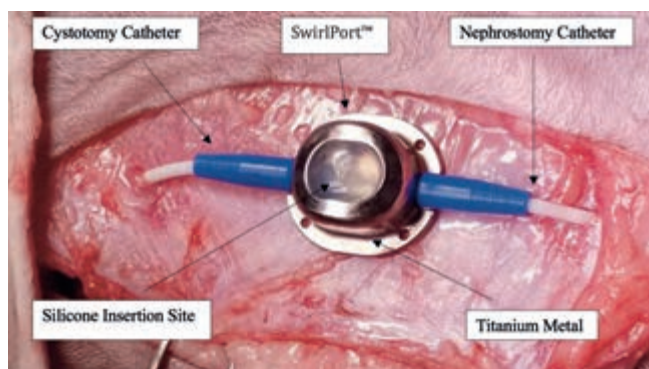


Figure 3. Labeled photograph of SwirlPort™ placed subcutaneously. Adapted from (Norfolk Vet Products, 2018c).

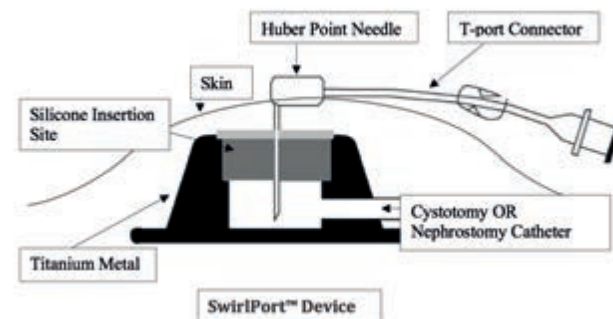


Figure 4. Diagram of a SwirlPort™ and Huber point needle during a SUB™ flush procedure. Adapted from (Norfolk Vet Products, 2018c).

Table 1. Actions of T-FloLoc™ (2% tetra-EDTA) flush and lock solution (Norfolk Vet Products, 2018b).

Mechanism	Action
Broad spectrum activity	Effective against both gram-positive and gram-negative bacteria.
Prevents and eliminates biofilm	Reduces microbial colonisation.
Effective anticoagulant	Aids and sustains patency while avoiding systemic anticoagulation.
Non-toxic	No known topical or systemic effects.
Anti-resistance	Does not induce drug resistant bacteria.
Reduces mineralisation	Aids prevention of occlusion from mineralisation.

Once home, the owner reported that the patient gradually increased consumption of food and the tube feeds were able to be reduced accordingly. Once self-sustaining well without supportive feeds, the oesophagostomy tube was removed. The removal was performed as a nurse consult and the stoma site healed quickly via secondary intention healing. No oesophagostomy-tube-associated complications were reported.

LONG-TERM DIET

With the likelihood that the case was obstructed due to calcium oxalate ureteroliths, dietary management may be considered relevant in prevention of recurrence. It must be noted that calcium oxalate stones and crystals cannot be dissolved. Factors involved in the pathogenesis of calcium oxalate ureterolithiasis and urolithiasis are poorly understood, but supersaturation of urine, hypercalcaemia and urine-acidifying diets are considered significant (Grauer, 2015; Kirk et al., 1995). As previously discussed, urinalysis is performed at each sub flush procedure which can allow for identification of crystalluria. In calcium oxalate cases, if urine specific gravity is >1.030 it is recommended to consider a wet food or encourage an increase in water intake through methods such as running water fountains, different bowls and locations.

If urine pH is <6.25 then a diet that promotes a reduction in urine acidity or adding urinary alkalisers

should be considered to minimise recurrence (Minnesota Urolith Center, 2021).

At the time of writing, the patient had not been placed on a urinary specific diet to reduce acidity, as overcoming inappetence and avoiding food aversion were of initial importance. A specific diet to prevent calcium oxalate formation can become a more predominant factor in management once the patient is considered more consistently stabilised. Furthermore, it should be considered in this case that both urinary oxalate and renal considerations are significant and, as such, both components should be encompassed for dietary recommendations.

COMPLICATIONS

With a significance of hypercalcaemia in the formation of calcium oxalates found, plus significant association found between high post-operative ionised calcium concentration and SUB™ device occlusion, calcium parameters should be monitored (Berent et al., 2018). There is a high level of diagnostic discordance between total calcium and ionised calcium. Many cats presented as normocalcaemic when measuring total calcium, but ionised calcium indicated derangement of calcium homeostasis (Schenck & Chew, 2010). It has therefore been advised to measure ionised calcium in calcium oxalate cases. In the patient discussed, ionised calcium proved to be intermittently elevated initially, but appears to have stabilised post-discharge (Table 2 of Part 1).

Persistent mild cystitis was a complication presented in this case, with the clinical signs of pollakuria and dysuria being prominent. Cystitis is often associated with feline lower urinary tract disease (FLUTD) and is most commonly idiopathic. Although the aetiology of cystitis is not well understood, stress has a strong association. In this case both the SUB™ placement and stress may have been likely contributors. Kulendra et al. (2021) suggested that cats demonstrating dysuria following SUB™ placement may be due to the cystotomy catheter(s) being placed close to and within the bladder apex, potentially causing irritation, inflammation and subsequent cystitis. The degree of irritation and inflammation should be limited however, due to the pigtail tip design that was a specific modification in response to one reported case of an ulcer in the mucosa of the bladder as a result of the cystotomy catheter tip. One study reported that 12.5% of cats with SUB™ placement experienced sterile cystitis (Vrijnsen et al., 2020). Although a variety of randomised clinical trials have been performed, no drug therapy has been identified as effective in feline idiopathic cystitis (FIC) (Poole, 2020; Sparkes, 2018). Many studies and findings on feline cystitis primarily focus on idiopathic cases. However, with the SUB™ device being the primary cause of cystitis in this case, opposed to idiopathic, it is limiting to apply current published findings to the treatment of this case.

In response to the ongoing cystitis, the patient was started on prednisolone (2.5mg SID) and prazosin (0.5mg q8h), a urethral sphincter muscle relaxant. The owner reported improvement, although not full resolution, and was satisfied with the patient's quality of life.

Other complications reported in cats with SUB™ placement include device occlusion from clots and stones, urinary tract infections (UTI), device leakage and kinking, and irreversible kidney damage. However, in a study of 134 cats with SUB™ placement 94% survived to discharge, and in another study of 95 cats, 89.5% survived to discharge. Overall, most studies have found that SUB™ placement is associated with a high prevalence of complications but with a median survival time of more than two years, suggesting that the majority of complications were manageable as was observed in the discussed patient (Berent et al., 2018; Kulendra et al., 2021).

Discussion

Cases of bilateral ureteral obstruction being resolved with bilateral subcutaneous ureteral bypass placement have proven to be relatively rare. The multidisciplinary approach and holistic nursing required

has been comprehensive but would not have been successful without the ongoing commitment and dedication of the owner.

Some may perceive the interventions and ongoing maintenance and monitoring to be considerably invasive, which could raise ethical concerns. However, as with any case, individual assessment is essential. What may be suitable for one case, may not be suitable for another. Both patient and owner should be considered individually. With medical management being unsuccessful, surgical intervention and euthanasia were the only viable options.

Conclusion

Thus far, the patient has had minimal complications, with the owner reporting a good quality of life despite recurring cystitis which they have considered manageable. The commitment of the owner and temperament of the patient bodes well with the ongoing requirements following SUB™ placement. Overall, holistic involvement of multiple disciplines, nursing care, owner compliance and patient compatibility is key to a successful outcome.

Acknowledgements

This article was enabled through the kind consent of Kolo's committed owner and the treating practice Pride Veterinary Centre. Gratitude to the primary clinicians overseeing Kolo's case: Jessica Adamany BSc DVM DipECVIM-CA MRCVS, Specialist of Internal Medicine who spent time proofreading this article and answering many questions, and Rosario Vallefuoco DVM DipECVS MRCVS Specialist of Small Animal Surgery. Furthermore, the number of staff involved in Kolo's care from the beginning, whether directly or indirectly, is unquantifiable but to everyone at Pride: thank you.

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Reflective professional development notes. To access hyperlinks to the references, scan the QR code on page 3.

Hospitalisation and recovery of an orange-winged Amazon parrot

DOI 10.1080/17415349.2021.1927924



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ABSTRACT Kittens, cats, puppies and dogs are often rehomed by staff in the veterinary profession when they are signed over, or lost and unclaimed. We cannot help but want to take them into our own care and make them part of our immediate family.

However, what happens when presented with a companion psittacine? This article has been created to provide an insight into owning a companion bird and the nursing considerations needed for the successful rehabilitation of a compromised Amazon parrot.

Key words orange-winged Amazon parrot, psittacine, avian, nebulise, training, rehabilitation

WHAT IS HE?

The Amazon parrot is deemed the archetypal green parrot, with the orange-winged (*Amazona amazonica*) (Figure 1) falling in that category, alongside other examples of Amazons, e.g. the yellow-headed Amazon (*Amazona oratrix*), blue-fronted Amazon (*Amazona aestiva*) and red-lored Amazon (*Amazona autumnalis*). The orange-winged has a life expectancy of 35–40 years (Harcourt-Brown & Chitty, 2005). Some studies suggest 39 is the maximum (Young et al., 2011) while the age of 60 years has been reported by Levine and Practice (2003). Generally, the larger the body mass, the longer the expected life-span (Munshi-South & Wilkinson, 2006).



Figure 1. Peridot, an orange-winged Amazon parrot (*Amazona amazonica*).

IS THE BIRD MALE OR FEMALE?

Genetically based sexing is the most reliable method of sexing the *Amazona* species. This can be done via blood samples, feather pulp samples or saliva samples (Harcourt-Brown & Chitty, 2005). Unfortunately, these invasive methods are not well tolerated and are likely to cause an increase in stress and a reduction in trust. Specialised equipment is used for the genetic testing and is therefore expensive to process, with a turnaround time of several weeks (Volodin et al., 2015).

It is an important step to establish the sex in order to rule out other potential conditions. Females are at risk of developing egg binding disorders due to hypocalcaemia as a result of poor nutrition. Males may develop testicular neoplasia resulting in weight loss and liver changes (Harcourt-Brown & Chitty, 2005). Blood tests revealed this parrot, named Peridot, was male.

History and assessment

SIGNALMENT AND PRESENTATION

According to the history acquired at the initial consultation, Peridot is a male orange-winged Amazon parrot, approximately 20 years old and weighing 350 grams. It was unknown if he was parent-reared or hand-reared and the length of previous owner's

ownership was not obtained. He arrived at the practice for a routine appointment, having fallen from his perch for the second time in the space of a few weeks, and was 'unable to right himself'. His diet for the previous year consisted of out-of-date seed and occasional fruit. It was recorded that his mobility had decreased and he appeared 'depressed'.

Physical examination by the veterinary surgeon (VS) revealed poor muscle mass in the legs and chest. The keel was easily palpable. His feather quality showed tatty feather edges and stress lines, which could indicate internal disease, lack of preening and/or poor nutrition (Figure 2) (Harcourt-Brown & Chitty, 2005). He displayed increased abdominal effort during inspiration and signs of chronic respiratory infection, which may have led to permanent damage. Prognosis was guarded. Radiographs or computerised tomography (CT) were discussed. However, factors contributed to halting the procedures, including his instability and likelihood of death in his current condition, and the client's financial restrictions.

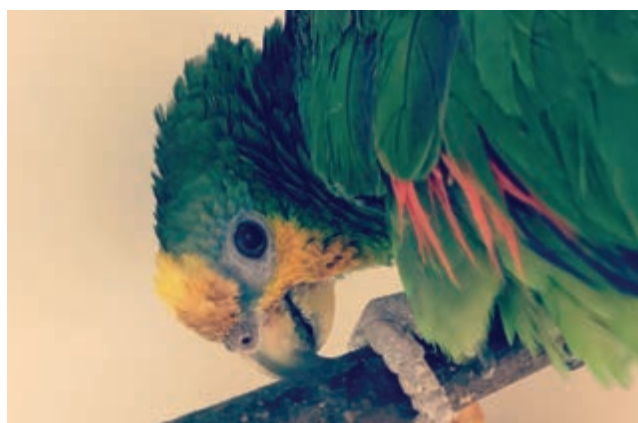


Figure 2. A photograph of Peridot on initial presentation. Note the split feather and altered colouration.

DIAGNOSTIC TESTS

Even in the healthiest of avian species, obtaining a sufficiently large blood sample for testing can be challenging (Hawkins et al., 2006).

As can be observed from Table 1, the heparinised plasma sample acquired was not sufficient to calculate sodium, potassium or ionised calcium levels. Biochemistry and haematology blood profiles were produced and these showed elevated levels of aspartate aminotransferase (AST). Alone, this could indicate muscle cell damage. In the event of creatine kinase (CK) levels being elevated alongside AST, the likelihood is muscle damage rather than liver damage.

It was concluded that reduced muscle mass and poor diet contributed to Peridot's condition.

Table 1. Biochemistry and haematology results received from the reference laboratory with the reference intervals also provided by the laboratory. Abnormal results in bold.

Parameter	Result	Reference interval
BIOCHEMISTRY		
Albumin	16 g/L	(12.0–22.0)
Total protein	35 g/L	(33–53)
Uric Acid	227 umol/L	(77.7–333)
Bile Acid	169.8 umol/L	–
AST (Aspartate aminotransferase)	642 IU/L	(35–200)
Creatine Kinase	1339 IU/L	(64–322)
Sodium	INSUFFICIENT SAMPLE	–
Potassium	INSUFFICIENT SAMPLE	–
Calcium	2.12 mmol/L	(1.87–2.42)
Ionised calcium	INSUFFICIENT SAMPLE	–
Cholesterol	5.5 mmol/L	(4.68–8.01)
Triglyceride	3 mmol/L	–
Amylase	399 u/l	–
HAEMATOLOGY		
White cell count	6.4 10 ⁹ /l	(5.0–17.0)
Haemoglobin	15.7 g/dl	(12.7–16.5)
PCV (Packed cell volume)	41%	(41–53)
MCHC (Mean corpuscular haemoglobin concentrate)	38.3 g/dl	–

Treatment plan, rehabilitation and nursing considerations

HOSPITALISATION

Peridot spent a total of four days at the clinic, separated from cats and dogs in a secluded exotic ward. It was important to remove the threat of predators while hospitalised to reduce his stress further and improve his recovery.

His quiet environment was isolated from traffic and human contact, other than the times where scheduled checks from nurses and veterinary surgeons were required and when medications were due. Fluid therapy was introduced in 10ml boluses of warmed lactated Ringers, spiked with a vitamin and mineral-supplement solution, administered subcutaneously via the inguinal fold. A seven-day course of enrofloxacin was introduced to combat the respiratory disease and the nostrils were flushed daily, with the aid of a 0.91mm diameter irrigating cannula, to improve the respiratory effort. This was well tolerated and did not require an anaesthetic to perform.



NUTRITION AND CROP FEEDING

In healthy psittacines, 1% of the body weight can be given as food (10ml/kg). This can be increased to 3% of the patient body (30ml/kg) if necessary (Edis, 2017). A plan was made to begin crop feeding. Hagen's Hari Tropic Hand Feeding Formula was used, beginning with 10ml initially (30ml/kg), and increasing this by 5ml each day.

Utilising the basic energy requirements (BER) calculation is advised when planning an accurate feeding regime.

$$\text{BER (Kcal/day)} = 78 \times (\text{body weight in kg})^{0.75}$$

(Froehlich & Forbes, 2015).

Improvement was observed in his appetite, demeanour and behaviour but he still had a poor prognosis.

DIET

Amazona amazonicas come under the feeding group of frugivores. In the wild, their diet consists purely of fruits (Harcourt-Brown & Chitty, 2005). In captivity, pellet or complete mixes should make up 60–80% of their daily diet, with the remaining 20–40% consisting of various treats, nuts and seeds, including sprouting seeds, fresh fruits and vegetables (Amazon Parrot Feeding Guide, 2021).

Lack of basic nutritional knowledge combined with some owners' reluctance to invest in more expensive but superior complete mixes may have contributed to an increase in psittacines being seen in veterinary clinics (Brightsmith, 2012). As Peridot improved in the short time he was hospitalised, food needed to be provided and be accessible. Due to the rarity of recovery and nursing a psittacine patient, the practice team contributed by providing nuts, vegetables and fruit – fresh and on a daily basis. Hand feeding was a reliable way to encourage eating and it appeared Peridot enjoyed the company and one-on-one time. Therefore, everyone was involved, the interaction was positive and the results were rewarding.

Personal research in veterinary texts helped to identify the everyday foods that contained the essential nutrients needed for Peridot's rehabilitation. Table 2 shows examples of fruits and vegetables high in vitamin A and protein. Reliable internet sites can be accessed. However, designing an up-to-date and basic guide may be more useful to owners and this is something that can be done by the veterinary nurse.

As well as these foods, multivitamin powder and liquid supplements were added to food and water. ZuPreem® fruit/veggie/nut dry pellet blends were purchased and provided daily (Figure 3). Treats were also offered, including avian-friendly fruit jelly cups, popcorn, and fresh mixed nuts, i.e. whole almonds, walnuts (in shells), cashews, pine nuts, monkey nuts (in shells) and brazil nuts. Figure 4 provides a visual representation of the proportions of foods that should be part of the parrot's daily intake.



Figure 3. Examples of high nutritional complete parrot food diets, including a variety of nuts and seed.

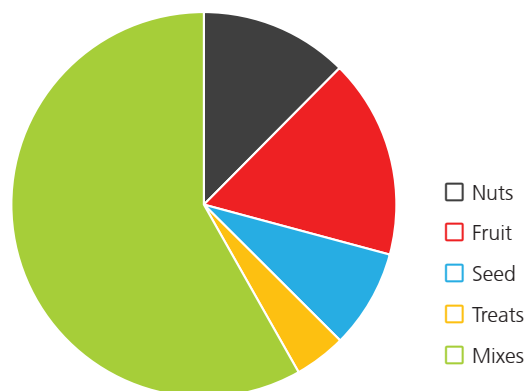


Figure 4. Advised daily nutritional requirements and the preferred quantities.

Table 2. Common vitamin A and protein rich foods required to reduce the risk of developing hypovitaminosis A and the recovery of muscle tone (Harcourt-Brown & Chitty, 2005).

Food	Vitamin A (IU/g)	Food	Protein (%)
Carrot	281.29	French bean	18.81
Red pepper	64.01	Peanuts (shelled)	25.8
Spinach	58.93	Sunflower seed	22.78
Sweet potato	65.51	Black beans	21.60

HYPOVITAMINOSIS A

Vitamin A is an important fat-soluble vitamin that can be stored in the body for long periods. Should vitamin A feature less in the diet, the stores are then used up, leading to vitamin A deficiency. It is identified as one of the most common conditions diagnosed in the veterinary clinic and it is a condition that can be easily avoided.

Signs of vitamin A deficiency include poor feather condition and altered colouration (these visual clues are often seen initially by the owner), metaplasia of the epithelial membrane and increased susceptibility to respiratory disease and infection. Hypovitaminosis A has a detrimental effect on many areas including the kidney, liver, keratin production, the reproductive system and increase in chronic infections. Vitamin A is needed in relatively large volumes (5000.00 IU/kg) for basic maintenance.

Other vitamin deficiencies include vitamin D which results in thinning egg shell and production, increased embryotic death and hypocalcaemia. However, this is more relevant to females as a lack of vitamin E causes poor reproductivity. Riboflavin B2 is a water-soluble vitamin found in nuts and, if lacking in the diet, contributes to poor feather quality, ataxia and diarrhoea (Froehlich & Forbes, 2015; Harcourt-Brown & Chitty, 2005).

Peridot's progression

On the fourth and final day of hospitalisation Peridot continued to improve. His respiratory effort decreased and there was minimal nasal discharge noted. He started to develop preening behaviours and was more active. There was a marked improvement in his appetite but his weight continued to decline. His increase in activity may account for this mild weight loss. It was discovered that the owner had made the decision to relinquish ownership of Peridot and, after considerable discussion, I decided to take him on.

A 'transfer of ownership' contract was drawn up to include both parties' and the animal's details (the contract must be signed by both parties for validation).

Due to his stabilisation and signs of continuous improvement, the decision was made to move him into the home. A medication and feeding plan was established and his original cage and belongings were donated and cleaned with bird-friendly disinfectant before he was placed back inside. This was done to remove any bacteria or viruses that may have contributed to the respiratory infection Peridot had developed. He was placed in a busy area of the home to encourage positive social interaction during the day. However, it was also suitable for rest periods (Baker, 2012). Hospitalised or recovering parrots should be allowed 12–14 hours of continuous rest, with limited

noise, lighting and visits (other than the times for feeding or medication) (Froehlich & Forbes, 2015).

Amazons are highly active birds, therefore placing perches at varying levels is advised. However, the cage set-up was adjusted to accommodate his ataxia, with perches placed in the lower third of the cage, along with a cushioned base and a parrot-friendly hammock. Shortly after his arrival, he settled and fed himself continuously, consuming multiple fruits, vegetables (Figure 5) and nuts, including high-potency nutritional pellets. Syringe feeding with the hand-rearing formula continued during social hours. His weight did fluctuate as his activity increased but did show an upward trend overall.

THE HUMAN-AVIAN BOND AND ENRICHMENT

After settling in to his new environment it was soon discovered that Peridot had a strong urge for human-avian bonding. He presented his head and neck multiple times and enjoyed human contact. Aengus and Millam (1999) defines tameness as 'the general absence of aggression toward humans and tolerance to handling'.

Categories highlighted in the study by Anderson (2014) include affection and physical contact. It states that this socialisation is important to young captive-reared parrots having good experiences during veterinary procedures and when performing basic husbandry. Principally, as with new puppy owners, encouraging psittacine owners to routinely check feet, ears and eyes while the bird is young improves the success of examinations when visiting the veterinary clinic.

Amazons are highly intelligent birds and require a large amount of enrichment to avoid boredom and, in severe cases, self-mutilation. Peridot particularly enjoys unravelling plaited ropes. Toys can be used to hide food and encourage wild foraging behaviour. However, due to his conditions, having food easily accessible was necessary.

TRAINING

During his time at the clinic, Peridot was restrained regularly and, understandably, responded aggressively towards towels and gloves, even from a distance. Positive reinforcement for a desired behaviour helped reduce his aggressive emotional response to these items. A highly regarded treat, toy or praise should be offered after every correct response to encourage repetition, decrease fear and improve bonding (Baker, 2012). Whistle or clicker training aids are useful communication tools due to their unique sounds (Martin, 2007).

Daily training with a chopstick was used initially: each time he touched the stick with his beak, a click followed and then a highly valued reward was offered by hand. Popcorn was the treat of choice. He then advanced to touch gloved hands, although this is still a work in progress.



Figure 5. Plenty of enrichment is essential to tackle boredom and reduce destructive behaviour.

Please note, animals are able to associate this unique sound positively, provided it is used in a positive way. The reverse can occur and the parrot may become anxious in anticipation of something negative occurring, so it is important to use these aids correctly and with caution.

Nebulisation

Upper and lower respiratory infections and disease are common conditions in the Amazon parrot (Levine & Practice, 2003). Peridot presented with nasal discharge, dyspnoea, sneezing and increased respiratory effort. Therefore, the nebuliser was used to provide relief four times a day for the period of thirty minutes.

The nebuliser is designed to administer medications into the upper respiratory tract and lower airways (Downing & Gibson, 2018). Medications, such as bronchodilators and antibiotics, can be delivered via this method (Froehlich & Forbes, 2015). Small particles, appearing as a partially opaque fog, are inhaled. Ideally, NaCl 0.9% should be used for the dilution of the medications or if nebulising solely to moisten the respiratory tract and encourage the removal of mucus caused by the infection.

The use of the nebuliser encouraged a bathing behaviour. Peridot exhibited a desire to preen his feathers, including using his water bowl as a bath. Amazon parrots – especially the orange-winged – display bathing behaviour when encouraged via simulated rainfall on a weekly basis and it is shown to improve the animals' welfare (Murphy et al., 2011).

Discussion

There was a sudden requirement to design and adapt the veterinary environment for the hospitalisation of this Amazon parrot. Although it is relatively rare to be presented with this particular species in a regular day-to-day clinic, it is less uncommon in specialised, exotics practices. Therefore it may be beneficial to work, volunteer or experience life in an exotics practice and adjust the ideas gathered to suit your exotics ward.

The development of in-house guides for psittacine owners, or those wanting to become responsible for a psittacine, is a reliable way to provide knowledge, basic husbandry and to recognise signs of ill health. It avoids owners researching online and finding potentially inaccurate advice.

Radiography will help establish the condition of the lung and air sacs, however, it has been advised to look into performing a CT scan over a radiograph. This does require anaesthesia which, at the time, was likely to be fatal.

Conclusion

Feather quality appeared to be a relevant indicator of progress during the rehabilitation process. Although rehabilitation is still ongoing, at the time of this report, Peridot is improving and his progress is very encouraging.

Do make sure there is a good variety of foods that are high in vitamin A and protein, as lack of these essential nutrients causes a wide range of visual and internal issues. Do not keep complete diet mixes past their expiration date. Change the food regularly.

Respiratory disorders and disease cause many avian patients to be seen in the veterinary clinic and, unfortunately, some owners decline offers of treatment due to financial implications.

Do maintain a biosecurity protocol with safe disinfectants and clean on a regular basis. If there are other birds in close proximity, ensure they remain separate from each other to avoid the spread of

diseases. Conditions that could easily be avoided with correct biosecurity and basic nutritional knowledge are left unaddressed.

It will never be 100% confirmed to what permanent damage Peridot has succumbed. However, regular checking of the biochemistry and haematology profiles will monitor his requirements. By doing so, it is possible for him to enjoy another 20 years of mutually rewarding life with his new family.

Do continue positive training to improve bonding, handling and trust. Do not restrict toys and enrichment when you are not available to be the entertainment.

It has been four months since Peridot was rehomed with changes put in place. His weight is still fluctuating but remains stable. Haematology and biochemistry tests have been repeated. There has been a marked improvement in the AST result and there was sufficient sample to record in potassium, calcium and sodium. The clicker training helped the veterinary surgeon extract a blood sample easily and with minimal fuss. Since the article was originally written, it was discovered that the previous owners were regular smokers and this could be a contributing factor to the respiratory condition. However, until radiography or CT is performed safely, maintaining his weight and wellbeing is being considered first.

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Reflective professional development notes. To access hyperlinks to the references, scan the QR code on page 3.





Part 1

Investigation into the experiences of clinical supervisors and their perceptions of their role, in addition to the factors that affect them

DOI 10.1080/17415349.2021.1975591



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Evie qualified as an RVN in 2015 and achieved her BSc in Veterinary Nursing from the RVC in 2016. She worked in first opinion practice for one year before returning to the RVC to work as a surgery ward nurse until 2018. Evie then left to pursue a career in teaching. She spent one year working for the College of Animal Welfare, before once again returning to the RVC as a teaching fellow in Veterinary Nursing. Her clinical interests include soft-tissue surgery, emergency medicine and wound management. In her spare time, she walks her dog Horace, swims and rides. Evie also has two cats called Bea and Darcy.

ABSTRACT The aim of this study is to investigate the experiences of clinical supervisors and their perceptions of their role and the factors that affect them via two key variables: confidence and satisfaction.

This communication explores the descriptive data collated in this study. A survey was distributed via Facebook, the BVNA and by direct email to RCVS Training Practices. The study gained ethical approval from the SSREB committee at the Royal Veterinary College URN SR2020-022.

Most clinical supervisors (75%) were keen, or very keen, to take on their role. Practical skills acquisition was the focus for clinical supervisors, and motivation, commitment and willingness were attributes in students that clinical supervisors felt were most important. This study provides a baseline understanding of the perceptions of clinical supervisors and the factors that affect them, which is of interest to employers, education providers, clinical supervisors and veterinary nursing students.

Key words clinical supervisor, clinical supervision, clinical coach, student veterinary nurse, veterinary education

Introduction

In order to join the Register of Veterinary Nurses, governed by the Royal College of Veterinary Surgeons (RCVS), student veterinary nurses (SVNs) must achieve approved standards of academic understanding and competency in a set list of skills (RCVS, 2021). This includes a requirement to complete 1,800 hours of clinical training in an RCVS-approved Training Practice for all qualification routes, under the supervision of a clinical supervisor (commonly referred to as clinical coaches or clinical assessors). A clinical supervisor can be a registered veterinary nurse (RVN), or veterinary surgeon (VS) who must be a Member of the Royal College of Veterinary Surgeons.

The clinical supervisor is responsible for mentoring the SVN through their practical training. They are a contact point for both the SVN and the training provider and are essential to the progression of the future profession. Without a clinical supervisor, an SVN cannot commence or complete their clinical training and therefore cannot graduate as an RVN. Yet, despite their important role in the training of SVNs, minimal studies have explored RVN experiences of clinical supervision.

This study explored general perceptions of the role and analysed two variables relating to clinical supervision: firstly, confidence within the role and secondly, role satisfaction. This information is presented over a three-part series, with this communication describing the initial descriptive findings.

Gaining a broader understanding of the perceptions of the clinical supervisors' roles will allow training providers and veterinary practices to identify issues and, if required, provide greater support to the clinical supervisors responsible for training veterinary nursing students. There are reported issues in medical nursing relating to a lack of confidence to fail students, dubbed 'failing to fail' (Hughes et al., 2016) and it is not known if the same occurs within the veterinary profession.

Holt et al. (2021) reviewed what the clinical coaches considered their roles to be, the further education they had undertaken, how long they had been qualified before undertaking their training, and how many students on average they supported – all of which were explored within this study. The results from this study will be compared to the recent 2021 findings to provide further depth to this area of understanding.

Aims

The aim of this study was to investigate the experiences of clinical supervisors and their perceptions of their role, in addition to the factors that affect them.

Objectives

1. To determine the demographics of clinical supervisors with regards to:
 - a. Role in the veterinary practice (RVN/MRCVS)
 - b. Prior experience in education
 - c. Reasons for no longer supporting students
 - d. Length of time spent as a clinical supervisor
2. To determine the motivation for becoming a clinical supervisor, for example:
 - a. Prior interest in becoming a clinical supervisor
 - b. If participants are asked or ask to become clinical supervisors
 - c. Time taken to become a clinical supervisor from qualification
 - d. Time to take on students following qualification
 - e. Educational qualifications undertaken prior or post clinical supervisor training
3. To determine the perceptions of the role with regard to:
 - a. What the clinical supervisor feels their main roles are
 - b. What the clinical supervisor thinks students believe their main roles to be
 - c. What attributes the clinical supervisors believe are required for a student to be successful

- d. If the clinical supervisor feels supported by practice
- e. If the clinical supervisor feels supported by training provider (the student's college or university)
- f. Where support is accessible from

Methodology

DATA COLLECTION METHOD

This study utilised Jisc survey software to distribute a questionnaire containing 29 questions, which was divided into sections as presented in the results. It utilised multiple choice, numerical and Likert response format questions, with an 'other' option when expansion was required. An open question was provided at the end to allow participants to provide any additional information.

PARTICIPANT RECRUITMENT

The participant inclusion criteria were Vets or RVNs in the UK who had undertaken clinical supervision training. The survey was distributed via Facebook, the BVNA and by direct email to RCVS Training Practices (through the RCVS 'find a vet' website and via a freedom of information request).

Participants were required to consent to the study after reading an information sheet which declared a potential conflict of interest, i.e., both researchers work at a teaching institution. No identifying personal data was collected from participants to reduce response bias due to this.

A sample size calculation was not completed as the total number of clinical supervisors working within the UK is currently unknown. The researchers attempted to quantify this unknown number by contacting the training centres detailed by the RCVS (RCVS, 2020). Ten out of the 50 training centres replied, and the combined number of clinical supervisors was 1,245 (range from responses 33–554).

ETHICAL APPROVAL

The study gained ethical approval from the SSREB committee at the Royal Veterinary College URN SR2020-022. No ethical issues were identified, and no personal data were collected. Participants read an information sheet prior to consenting to participate.

Results

There were 301 responses, two of which were removed due to incomplete responses to all questions. Of the 299 responses, 6% ($N = 17$) of participants were Vets and 93% ($N = 278$) were RVNs. 1% ($N = 4$) of participants did not respond to this question and their responses were omitted from analysis. Therefore, 295 participant responses were analysed unless stated otherwise.

Table 1. Respondent location.

UK region	Number of respondents
Northern Ireland	1
North East	9
Yorkshire and the Humber	15
Scotland	16
West Midlands	16
Wales	19
East of England	21
East Midlands	22
North West	25
Greater London	26
South West	57
South East	71

Participants were asked in which practice type they worked. 73% ($N = 216$) of participants stated that they worked in a first opinion general practice, 11% ($N = 31$) worked in a first opinion hospital, 9% ($N = 25$) worked in a referral hospital, 4% ($N = 13$) worked in a university hospital and 1% ($N = 3$) of participants worked in a charity practice. 2% ($N = 7$) of participants selected 'other'. The survey attracted responses from across the UK – detailed in Table 1.

CURRENT SUPPORT OF STUDENTS

Participants were asked if they were still supporting students in the veterinary practice. 87% ($N = 258$) were and 13% ($N = 37$) of clinical supervisors that responded to this survey were no longer supporting students. The latter were asked to provide a response as to why. Their responses were grouped:

- The respondent is now a locum or no longer in the veterinary practice (32%, $N = 12$)
- Practice Covid-19 restrictions (26%, $N = 10$)
- Limitations on student number at the practice (18%, $N = 7$)
- Additional roles within the practice (11%, $N = 4$)
- High caseload (5%, $N = 2$)
- Taking a rest period (3%, $N = 1$)
- Personal feelings regarding training students (3%, $N = 1$)

THE ROUTE TO BECOMING A CLINICAL SUPERVISOR

Participants were asked if they wanted to become a clinical supervisor. 37% (*N* = 108) of participants were 'very keen' to become a clinical supervisor, 38% (*N* = 111) were 'keen', 16% (*N* = 48) were 'indifferent', 8% (*N* = 23) 'would have preferred not to have become a clinical supervisor' and 1% (*N* = 5) 'did not want to be a clinical supervisor'.

Participants were asked how they decided to become a clinical supervisor. The most frequent answer selected 56% (*N* = 166) was: 'I was asked by the practice to become a clinical supervisor and I wanted to'. This is further explored in Figure 1.

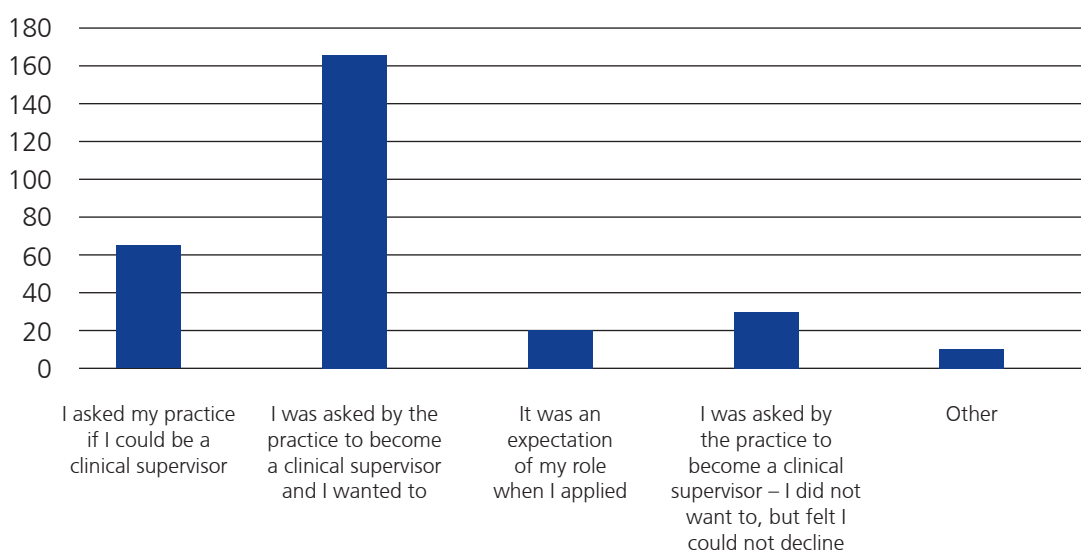


Figure 1. Route to becoming a clinical supervisor.

Participants were also asked how long they were qualified before undertaking clinical supervisor training. 294 participants responded to this question: 76% (*N* = 224) were qualified over a year before they became a clinical supervisor, (median of 3 years, range 1–40 years). The remainder (24%, *N* = 70) were qualified for less than a year before becoming a clinical supervisor, (median of 6 months, range 1–11 months).

Participants were then asked how long they have been a clinical supervisor. 89% (*N* = 263) of participants had been a clinical supervisor for more than a year, (median of 5 years, range 1–34 years). The remaining 11% (*N* = 32) had been a clinical supervisor for less than a year, (median of 6 months, range 1–11 months).

Finally, participants were asked how long the period was between their clinical supervisor training and them supporting a student. 69% (*N* = 204) supported a student immediately (within 4 weeks), 23% (*N* = 69) supported students soon after training (within 6 months), 3% (*N* = 8) supported students a while after training (between 6 months and a year) and 5% (*N* = 14) supported their students over one year later.

CLINICAL SUPERVISOR AND TEACHING EDUCATION

A range of questions relating to clinical supervisors' own education were asked. 21% (*N* = 62) of participants had undertaken education-focused qualifications prior to becoming a clinical supervisor, with the most frequently reported answer being the A1 assessor qualification 87% (*N* = 54).

A minority, 6% (*N* = 19) of participants had undertaken additional education-focused qualifications since their clinical supervisor training, with the most common qualifications reported as the Post Graduate Certificate in Veterinary Education 26% (*N* = 5) and Level 3 Award in Education and Training (PTTLs) 26% (*N* = 5).

Table 2 explores the perceptions of the additional post-clinical supervision training on their role in supporting students.

THE ROLE OF THE CLINICAL SUPERVISOR

Participants were asked to select what they felt were within their duties as a clinical supervisor. The most selected duty was practical skills acquisition (NPL) 99% (*N* = 294), followed by role modelling 95% (*N* = 279) and personal/pastoral support 90% (*N* = 266). When asked to select the key role of the clinical supervisor, the order of the top three remained the same.

When participants were then asked what they feel students think their role entailed. Practical skills acquisition (including NPL) was again the most selected answer 93% (*N* = 273, followed by completion of placement documentation 59% (*N* = 173). Application of academic knowledge (including help with assignments) was third 54% (*N* = 160). Again, practical skills acquisition (including NPL completion) was the most selected answer 88% (*N* = 259) when participants were asked to pick just one of the above choices.

Table 2. Perceptions on the effects of further education after becoming a clinical supervisor.

	I fully agree	I somewhat agree	I neither agree nor disagree	I somewhat disagree	I fully disagree	Left blank
Enhanced pastoral support to their VN students	52% (N = 10)	37% (N = 7)	11% (N = 2)	0	0	0
Enhanced academic support to my VN students	63% (N = 12)	26% (N = 5)	11% (N = 2)	0	0	0
Enhanced practical support to my VN students	58% (N = 11)	32% (N = 6)	5% (N = 1)	5% (N = 1)	0	0
Improved overall experience of being a clinical supervisor	47% (N = 9)	21% (N = 4)	21% (N = 4)	5% (N = 1)	0	5% (N = 1)
Improved overall confidence in their ability as a clinical supervisor	58% (N = 11)	16% (N = 3)	21% (N = 4)	5% (N = 1)	0	0

STUDENT ATTRIBUTES

Participants were asked to select the top three attributes that they feel are required for a successful SVN. Motivation was the most selected 66% (N = 196), followed by commitment 63% (N = 185), and willingness 35% (N = 102).

SUPPORT IN CLINICAL SUPERVISION

Participants were then asked about the support they receive in their role, starting with how well supported they felt, as detailed in Table 3.

They were then asked where they gained support from: 47% (N = 139) of respondents selected that they gained support from the training provider, followed by the practice team 41% (N = 121), and other clinical supervisors within the team 35% (N = 103).

FINAL COMMENTS

Participants were asked if they had any final comments they would like to raise: 57 participants added extra information and similar answers were grouped. The top three themes were:

- A need for enhanced support from the teaching provider 19% (N = 11)
- A need for time to support students 14% (N = 8)
- A need for recognition of the work conducted 10% (N = 6), but clinical supervisors loved their roles 10% (N = 6)

Discussion

This study has provided a baseline for a portion of the vast knowledge gap that exists on clinical supervisors, useful to a range of stakeholders. A full discussion will be provided over the three-part series, with the following focused on the descriptive data presented.

While there are no centralised data on the demographic of clinical supervisors, this study's population reflected the experiences of practice, with greater numbers of respondents being RVNs in first-opinion practice. Most clinical supervisors had been qualified for over a year before undertaking their training, with a median of 3 years – similar to the 2.2 years noted by Holt et al. (2021).

It is clear from this study that practical skills acquisition is thought to be the focus for clinical supervisors, which aligns to the main purpose of their existence and is comparable to the results presented by Holt et al. (2021). Role modelling and personal support were also key themes, partially correlating with the participants in the McIntosh et al., (2013) study in human nursing and, again, Holt et al. (2021). Interestingly, this aligned to the areas that supervisors felt both most and least confident in, discussed in the second communication in this series.

It was felt that students believe completing placement documentation and help with academic assignments is also of importance for the clinical supervisor to assist with. As assessment is considered to drive learning (Wormald et al., 2009), and the NPL, assignments and placement documentation are all linked to assessment, this seems logical. Further exploration of the students' views of this is required to compare if these perceptions of

Table 3. Likert response format for how supported clinical supervisors feel.

	5. Fully applies to me	4. Generally applies to me	3. Somewhat applies to me	2. Generally does not apply to me	1. Definitely does not apply to me
I am well supported as a clinical supervisor by the practice	13% (N = 38)	27% (N = 79)	28% (N = 84)	22% (N = 65)	10% (N = 29)
I am well supported as a clinical supervisor by the college/university	14% (N = 42)	34% (N = 100)	31% (N = 93)	15% (N = 43)	6% (N = 17)

each other’s priorities are accurate and if any differences between the two impact the working relationship and students’ success.

This study also explored the attributes that clinical supervisors felt were key to a successful student. Motivation, commitment and willingness were deemed to be the most important, comparable to those reported by supervisors of medical nurses (McIntosh et al., 2014). It is again something that needs to be correlated to student outcomes. However, it is useful for training providers, employers and prospective students to know the general attributes that clinical supervisors desire in their students.

Motivated clinical supervisors are important too. It was encouraging to see that most respondents, 75% (n = 219), were keen or very keen to take on their role. Although most were asked to take on the role and did not suggest this themselves, the majority of SVN’s supported by participants of this study are being trained by someone who wished to undertake this role.

Most clinical supervisors felt somewhat supported by the practice and generally supported by the college or university. However, enhanced support from the training providers was also frequently requested in the final question of this study, which is unsurprising considering 47.5% of clinical coaches in a previous study felt they were unprepared following their training (Holt et al., 2021).

Participants were also asked to evaluate how they felt the prior or additional training had supported their clinical supervision. Of those participants who had undertaken prior qualifications (21%, n = 71) and post-training qualifications (6%, n = 19), it was felt their experience as clinical supervisors was improved. The 6% (n = 19) of respondents who completed post-clinical supervisor

training/qualifications felt they had a positive impact on their experiences as clinical supervisors, with 68% selecting that they agreed to some extent that their additional qualifications had improved their overall experience of the role. Again, the effects of these qualifications on the students’ progression requires review. Whether further training would be beneficial for all clinical supervisors and additional satisfaction factors are explored in Part 2 of this study.

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Part 2

Investigation into the experiences of clinical supervisors and their perceptions of their role, in addition to the factors that affect them

DOI 10.1080/17415349.2021.1975001

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ABSTRACT The aim of this study is to investigate the experiences of clinical supervisors and their perceptions of their role. This communication explores the data relating to confidence as a clinical supervisor. A survey was distributed via Facebook, the BVNA and emails to Training Practices. The study gained ethical approval from the SSREB committee at the Royal Veterinary College URN SR2020-022. Overall participants were confident as clinical supervisors. Increased confidence scores were found to be associated with interest in becoming a clinical supervisor ($p = 0.05$), prior education-focused qualifications

($p < 0.001$), time spent as a supervisor ($p < 0.001$) and the support provided by the practice ($p < 0.001$) and teaching institution ($p = 0.016$). Areas that demonstrated lower confidence were areas the teaching institutions should provide support for. This study provides a baseline understanding which is of interest to employers, education providers, clinical supervisors and veterinary nursing students.

Key words clinical supervisor, clinical supervision, clinical coach, student veterinary nurse, veterinary education, role satisfaction, confidence, training

Introduction

This is the second communication in a three-part series on the experience of clinical supervisors and the perceptions in their role exploring the descriptive data collated on self-reported confidence of clinical coaches and factors that affect this.

In exploring self-reported confidence in the range of tasks expected of a clinical supervisor, a picture will be built around whether supervisors feel prepared and able to lead a student in their clinical progression and assess them fairly, accepting or declining competence. There is no data to suggest how confident veterinary clinical supervisors are in any parts of their role and if, therefore, further support is required. However, Holt et al. (2021) explored the preparedness of clinical coaches following clinical coach training and 45.5% felt that this had not prepared them well.

Methods

The methods are described fully in Part 1 of this study. This study utilised Jisc survey software, containing 29 questions, distributed to clinical supervisors (RVNs and veterinary surgeons) by social media and emails to RCVS Training Practices.

The study was granted ethical approval from the SSREB committee at the Royal Veterinary College URN SR2020-022.

DATA ANALYSIS

Data collected were analysed in IBM® SPSS Statistics®. All numerical data were not normal in distribution and therefore non-parametric statistical analysis methods were utilised (Chi Square test, Kruskal-Wallis, Mann Whitney U test and Spearman's correlation co-efficient). Hypothesis testing was reported in reference to $p \leq 0.05$.

Objectives

1. To determine how confident participants feel as a clinical supervisor
2. To determine which factors may affect confidence as a clinical supervisor

Hypotheses

There will be an association between reported levels of confidence as a clinical supervisor and:

- Those who sought to become a clinical supervisor
- Those who have been a clinical supervisor for longer

- Those who have been qualified for longer prior to taking on students
- Those who have undertaken further training before becoming a clinical supervisor
- Those who have undertaken further training after becoming a clinical supervisor
- The length of time the participant has been a clinical supervisor
- Feeling supported as a supervisor by the practice
- Feeling supported as a supervisor by the training provider

Results

DESCRIPTIVE DATA

Confidence as a clinical supervisor

Participants were asked to rank their feelings towards nine tasks that they may complete, ranging from not confident at all (1) to very confident (5). This question was analysed as an individual confidence score and in relation to the task itself. The median confidence score was 41 (range 23–45) and the skill that participants felt most confident in was demonstrating nursing tasks (total score 1314). This was followed by accepting competency (total score 1293), providing constructive feedback (total score 1256), and declining competency (total score 1254). Participants were least confident in supporting personal issues (total score 1151), addressing professional issues (total score 1153), and reporting student issues to the teaching provider (total score 1163).

STATISTICAL ANALYSIS

The self-reported confidence scale was analysed further against prior interest, qualifications, time spent as a supervisor, and feeling supported within the role. The data for these variables were described in Part 1.

Prior interest

The relationship between prior interest in becoming a clinical supervisor and self-reported confidence score was analysed. The variations within the groups are described in Figure 1 and these variations were statistically significant $p = 0.05$. Post hoc tests demonstrated that those who are very keen to become clinical supervisors have a statistically significant greater level of confidence compared to those who are keen ($p = 0.01$), indifferent ($p = 0.002$) or would have preferred not to have become a clinical supervisor ($p = 0.015$).

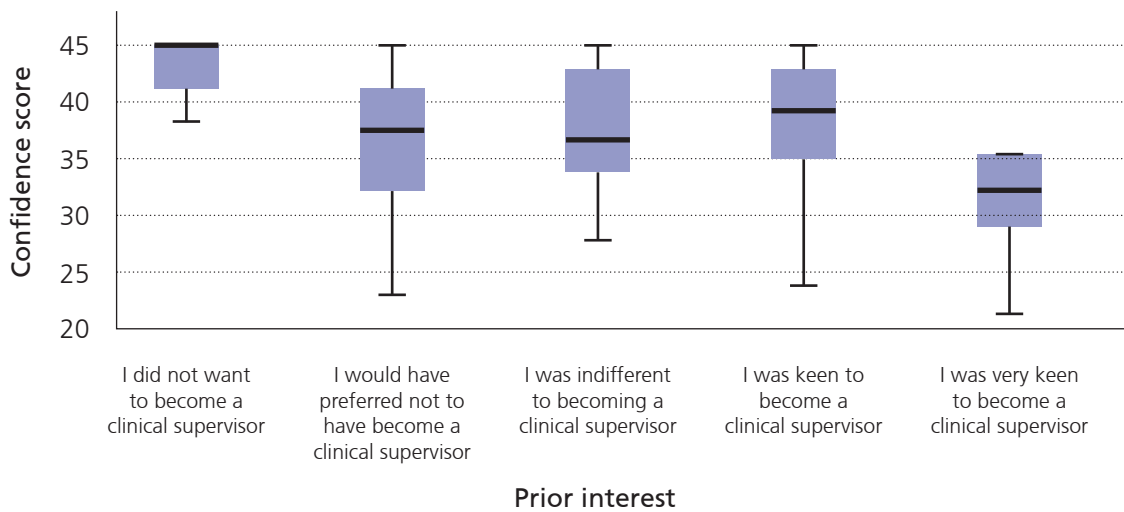


Figure 1. Box and whisker plot demonstrating mean confidence scores versus prior interest.

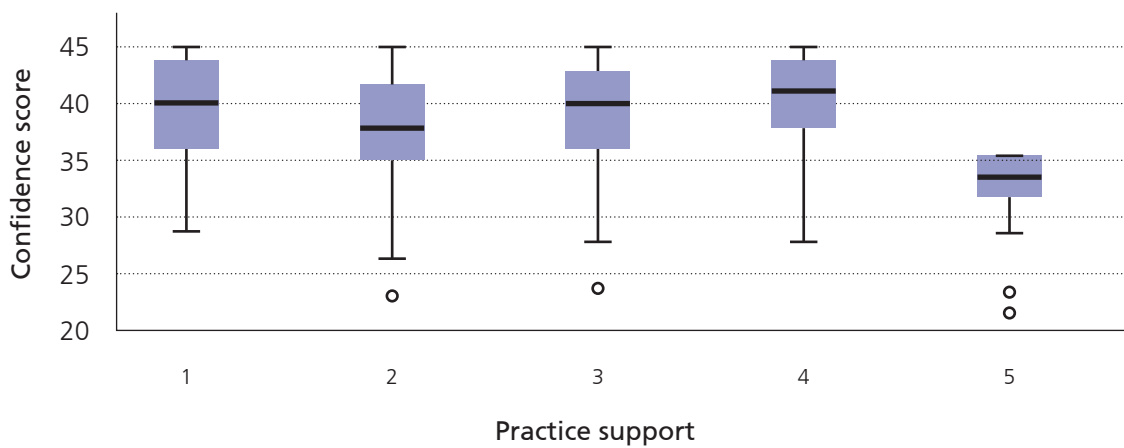


Figure 2. Practice support versus confidence score.

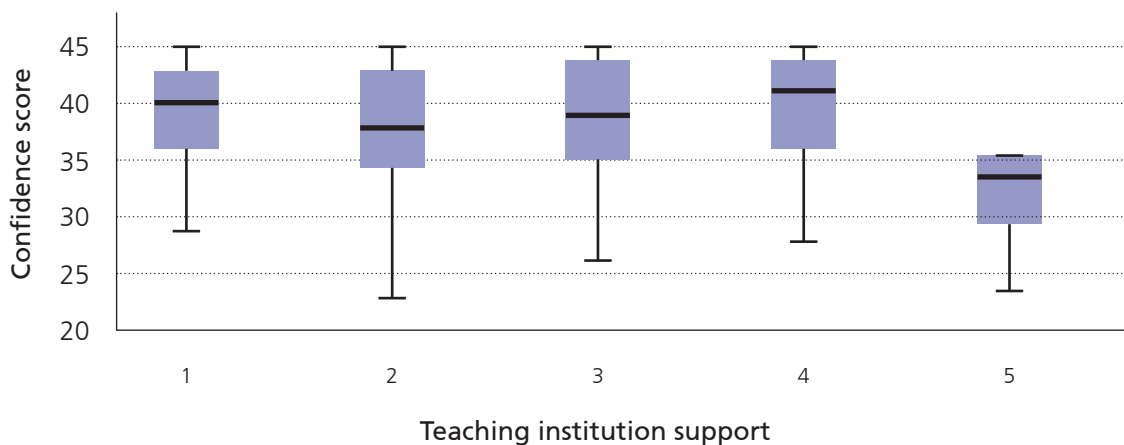


Figure 3. Training provider support versus confidence score.

Prior qualifications

The median confidence score for those who had not undertaken prior qualifications in education was 40 (range 23–45). The median for those who had undertaken educational qualifications prior to becoming a clinical supervisor was 42 (range 28–45). This was a statistically significant difference $p = < 0.001$, with those undertaking prior educational qualifications being more likely to report higher levels of confidence.

Post qualifications

The median confidence score for those who had not undertaken prior qualifications in education was 40 (range 23–45). The median for those who had undertaken educational qualifications after becoming a clinical supervisor was 44 (range 28–45). This was not a statistically significant difference $p = 0.212$, therefore it is unlikely that those who have undertaken further qualifications in education after becoming a clinical supervisor will have higher confidence scores.

Months as a clinical supervisor

For analysis of this variable, years were converted into months. There was a weak positive correlation (0.27) between the number of months a participant had been a clinical supervisor and their self-reported confidence score. This association was statistically significant, $p < 0.001$, demonstrating that there is an association with time spent as a clinical supervisor and confidence as a clinical supervisor.

Months spent qualified before becoming a clinical supervisor

Again, for analysis of this variable, years were converted into months. There was a weak positive correlation ($p = 0.035$) between the number of months spent qualified before becoming a clinical supervisor and their self-reported confidence score. This association was not statistically significant, $p = 0.56$, demonstrating that there is not likely to be an association between the number of months spent qualified before becoming a clinical supervisor and self-reported confidence score.

Feeling supported by the practice

The variations within groups for feeling supported by the practice are described in Figure 2, with 1 describing supervisors that did not feel supported at all and 5 being fully supported, as per Figure 3. This variation was statistically significant $p = < 0.001$, with the difference occurring between those who felt ‘fully’ supported by the practice and all other variables as per Table 1.

Table 1. Statistical significance of those feeling fully supported versus lesser support variables.

Level of support versus feeling fully supported	Statistical significance
Generally supported (4)	0.025
Somewhat supported (3)	< 0.001
Generally not supported (2)	< 0.001
Definitely not supported (1)	0.010

Feeling supported by the training provider

The variations within groups for feeling supported by the training provider are described in Figure 3, again, with 1 describing supervisors that did not feel supported at all and 5 being fully supported. These differences were statistically significant, $p = 0.016$, with significance occurring between confidence scores and those feeling fully supported by the training provider (5) compared to those who feel ‘generally unsupported’ (2) $p = 0.01$, ‘somewhat supported’ (3) $p = 0.003$, and ‘generally supported’ (4) $p = 0.022$.

Discussion

Overall, high levels of confidence were reported by clinical supervisors which is encouraging. Those who were very keen to become a clinical supervisor reported statistically significant higher levels of confidence than those who were keen, indifferent, or would have preferred not to have become clinical supervisors. While practices may not have the staffing to be selective over who becomes a clinical supervisor, it is the individual’s decision whether they do indeed undertake the training. With the high attrition rates within the veterinary profession, discussed in Part 3 of this study, it is in the best interest of employers that their employees are content and confident in all aspects of the role.

Participants were most confident in the skills that are commonly undertaken, demonstrating skills, accepting SVN competency and providing feedback. However, participants were least confident with supporting personal issues, addressing professional issues, and reporting student issues to the college and university. Despite these being within the themes of the perceived role of the clinical supervisor, these are not roles that the clinical supervisor would be expected to undertake solely, and support from the training provider would be offered. Enhanced communication from the training provider regarding the remit of the clinical supervisor

may be beneficial, detailing referral processes for such student issues. While it is yet to be ascertained if this confidence, or a lack of it, affects student outcomes, it is important to address the feelings of those conducting the role and ensure they know the extent to which they should be supporting their SVNs.

Feeling supported as a clinical supervisor by the practice and teaching institution was positively associated with higher confidence scores. Again, while confidence has not been correlated with student outcomes, having the confidence to demonstrate tasks, appropriately assess them, declining competence when necessary, or referring SVNs back to the teaching institution, as required, is an essential safety net for the profession.

Developmental factors, time and further training were additionally assessed in relation to confidence. A weak positive correlation occurred between the time spent as a qualified veterinary professional prior to becoming a clinical supervisor and confidence score. However, this was not statistically significant. The RCVS state that professionals should be clinically mature before embarking on clinical supervision (RCVS 2017). What this means to the individual is left open and while the handbook states that newly qualified nurses are not appropriate clinical supervisors, there is no formal restriction on this. This creates flexibility for discretionary appointments based upon the individual and their pre-registration experience.

In some healthcare settings, greater initial support in the early years of being a clinical supervisor is provided through a buddy system. An example of this is reported by Webb and Shakespeare (2008), whereby students reported higher levels of satisfaction when a newly trained mentor was supported by a more experienced mentor. The students benefitted from the teaching and clinical experience the latter provided but also the understanding of the training programme and documentation from the former. While this model sounds ideal, its feasibility in practice may prevent it. It would, however, be something for practices and veterinary groups to consider where possible.

Further or more regular contact with newly qualified clinical supervisors may also be an option, mimicking the support provided for human-centred nursing supervisors. The NMC states that those who have a long history of supporting students may not require additional training, whereas less experienced nurses may, and this is provided for them (NMC, 2018).

Further training was also explored in respect to whether this increased confidence scores. Those who had previously undertaken qualifications reported statistically significant higher levels of confidence. However, no relationship was found between confidence and undertaking further qualifications after becoming a clinical supervisor. The sample size for the latter was small and therefore statistically significant differences

may not have been detected. Similarly small numbers of further education training were noted by Holt et al. (2021). Further research into the individual training routes and the effect on individual clinical supervisors and their students' outcomes should be undertaken to explore this relationship further. This would also be recommended for those having undertaken prior qualifications due to the proportion of respondents reporting they had previously undertaken the A1 qualification, the clinical supervision training prior to the change to the NPL (RCVS, 2011). Therefore, this increase in confidence may not be due to specific training, but rather the increased length in service which, as discussed, was found to demonstrate a weak positive correlation within this study.

A full summary and conclusion will be presented in Part 3, with limitations detailed. However, the overall theme from this section is that clinical supervisors are confident in most areas but, with greater support from both teaching institutions and practices, this could be improved. Having mentors who are confident in their roles, and therefore confident in their assessment of students, is imperative to ensure that a new generation of the profession has undergone adequate training, are safe in their practice, and are themselves inspired to support SVNs.

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Part 3

Investigation into the experiences of clinical supervisors and their perceptions of their role, in addition to the factors that affect them

DOI 10.1080/17415349.2021.1975002

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ABSTRACT The aim of this study is to investigate the experiences of clinical supervisors and their perceptions of their role. This communication explores clinical supervisor satisfaction. A survey was distributed via Facebook, the BVNA and emails to Training Practices. The study gained ethical approval from the SSREB committee at the Royal Veterinary College URN SR2020-022. Most respondents enjoyed clinical supervision and found it enhanced their enjoyment of their professional role. Reported challenges of the role were sufficient time with the student, competing

time pressures and staying current with academic requirements. There were statistically significant differences between satisfaction in the role and college or university support ($p = 0.002$), practice support ($p < 0.001$) and desire to be a clinical supervisor ($p < 0.001$). Satisfaction in clinical supervision was high despite challenges posed. However, with retention issues in the veterinary profession, these challenges should be reduced where possible.

Key words clinical supervisor, clinical supervision, clinical coach, student veterinary nurses

Introduction

In 2019, the British Equine Veterinary Association (BEVA) and British Small Animal Veterinary Association (BSAVA) undertook a recruitment and retention survey. At that time, 54% of veterinary nurse respondents suggested that they were likely to be looking for a new job in the next two years, with 35% looking to change their role within the profession, moving away from clinical practice or leaving the profession entirely (BEVA, 2019). Pay, remuneration, stress and the feeling of being undervalued were the most prolific issues within the profession when a similar study was undertaken by Robinson et al. (2019a).

Veterinary surgeons were more likely to stay within their current role. However, 43% of respondents were still looking to change their job within the next two years (BEVA, 2019). 45% of these were, again, looking to change their role within the profession, move away from clinical practice or were considering leaving the profession entirely (BEVA, 2019). Pay, being valued and the stressful work environment were again raised as some of the issues in the respective study by Robinson et al. (2019b) on the veterinary profession.

While these figures have vast effects on practising professionals who are already qualified, they may also affect those training to enter the profession. With the stipulation that student veterinary nurses (SVNs) must be assigned to a clinical supervisor, the greater the number of registered veterinary nurses (RVNs) and veterinary surgeons that leave the profession, the smaller the pool of clinical supervisors there are to supervise these students, creating a negative cycle.

Furthermore, it is a recommendation of the Royal College of Veterinary Surgeons that supervisors are clinically mature (RCVS, 2017), which was supported by the results of Part 2 of this study. With poor retention, these requirements may be unachievable and unsustainable. Although it is not within the scope of the study to investigate general job satisfaction, the levels of satisfaction within the clinical supervisor role and the factors that may affect this will be discussed.

Aims, objectives and hypotheses

Part 1 of this study presented the aims, objectives, hypotheses, general descriptive data and methodology. Part 2 presented the statistical analysis pertaining to confidence in clinical supervision. Part 3 presents the factors relating to job satisfaction and concludes the overall study.

Objectives

1. To determine the average workload of a clinical supervisor to include:

- a. Average numbers of students per clinical supervisor at one time
 - b. Average numbers of students per clinical supervisor per year
 - c. If clinical supervisors are provided with protected time to undertake their role
2. To determine the perceptions of the role in regard to:
 - a. Whether clinical supervisors enjoy the role
 - b. If being a clinical supervisor enhances the role of RVN/MRCVS
 - c. If clinical supervision is seen as a challenging role
 - d. What the greatest challenges of the role are
 3. To determine if there are reward systems in place for clinical supervisors
 4. To determine which factors may affect level of enjoyment

Hypothesis

There will be an association between level of enjoyment and:

- Those who wanted to become a clinical supervisor (described in Part 1)
- If the clinical supervisor feels supported by the practice (described in Part 1)
- If the clinical supervisor feels supported by the training institution (described in Part 1)
- The number of students supported at one time
- The number of students supported per year
- If the clinical supervisor is provided with time to undertake their role

Methods

The methods are described fully in part one of this study. This study utilised Jisc survey software, containing 29 questions, distributed to clinical supervisors (RVNs and veterinary surgeons) by social media and emails to RCVS Training Practices.

The study was granted ethical approval from the SSREB committee at the Royal Veterinary College URN SR2020-022.

Results

DESCRIPTIVE ANALYSIS

295 respondents were included in this study and analysed, unless stated otherwise due to missing responses. Much of descriptive statistics are presented in Part 1. However, those relating to satisfaction were as follows:

Number of students supported

Participants were asked how many students they would normally supervise at one time; the median was one student (range 1–4).

The average number of students that a clinical supervisor would support in a year was then ascertained, with 293 replies analysed. The median response was one student a year (range 1–6). Those who responded 6 or 6+ ($N = 2$) worked in a role with rotating SVNs or supporting SVNs was their primary role.

Time allocated to clinical supervision activities

Participants were then asked how much time they are allocated to complete clinical supervision tasks. 67% ($N = 198$) of 294 respondents were not allocated time in their working day to undertake tasks relating to their role as a clinical supervisor. Of those that were, the median time allocated was 2 hours a week (range 0.5 hour to 8 hours).

Enjoyment in clinical supervision

Participants were asked to rank their feelings towards a range of statements regarding their role as a clinical supervisor. Full results can be viewed in Table 1.

Most participants stated that they enjoy being a clinical supervisor, with 42% ($N = 125$) and 41% ($N = 120$) stating that the statement ‘fully’ or ‘generally’ applies to them, respectively. Likewise, most participants ‘fully’ (34% $N = 100$) or ‘generally’ (34% $N = 101$) agreed

that being a clinical supervisor improved the enjoyment of their RVN/MRCVS role. When asked if they found the role of clinical supervisor challenging 38% ($N = 114$) reported ‘somewhat agree’ and 30% ($N = 88$) stated ‘generally agree’.

When asked to expand on the greatest challenge in the role, the three most-selected answers were:

- Time management/competing commitments, 64% ($N = 188$)
- Contact time with the student, 21% ($N = 61$)
- Staying current on the students’ academic requirements, 9% ($N = 28$)

Reward systems for clinical supervisors

Participants were asked to indicate if there is a reward system in place for being a clinical supervisor within their employment, selecting as many responses as applicable. 54% ($N = 159$) of the participants stated that there were no reward systems in place for being a clinical supervisor. 29% ($N = 86$) of participants stated that being a clinical supervisor is seen as a senior role and 13% ($N = 39$) stated that there was a financial incentive provided by the practice for being a clinical supervisor. 17% ($N = 49$) of participants reported that being a clinical supervisor was a requirement of their practice’s recruitment strategy and therefore they may not have gained the job without this qualification.

Analytic results

To achieve Objective 4, factors collated in this study were compared to level of enjoyment of the role.

Prior interest

Cross tabulations were conducted for the relationship between the prior interest of the participant in becoming a clinical supervisor and their level of satisfactions as a clinical supervisor. There were

Table 1. Likert response format for job satisfaction.

	Fully applies to me	Generally applies to me	Somewhat applies to me	Generally does not apply to me	Definitely does not apply to me
I enjoy being a clinical supervisor	42% ($N = 125$)	41% ($N = 120$)	11% ($N = 31$)	4% ($N = 12$)	2% ($N = 7$)
Being a clinical supervisor improves my enjoyment of my RVN/MRCVS role	34% ($N = 100$)	34% ($N = 101$)	21% ($N = 61$)	8% ($N = 25$)	3% ($N = 8$)
I find being a clinical supervisor challenging	9% ($N = 26$)	30% ($N = 88$)	38% ($N = 114$)	19% ($N = 56$)	4% ($N = 11$)

low cell counts, therefore both variables were regrouped as follows:

Prior interest:

- 'I was not keen to become a clinical supervisor' combined: 'I definitely did not want to become', 'I would have preferred not to have become', and 'I was indifferent to becoming' a clinical supervisor'
- 'I was keen to become a clinical supervisor' combined: 'I was very keen' or 'I was keen' to become a clinical supervisor'

Level of satisfaction:

- 'I am dissatisfied with being a clinical supervisor' combined: 'I definitely do not enjoy', 'I generally do not enjoy', and 'I sometimes enjoy' being a clinical supervisor'
- 'I am satisfied with being a clinical supervisor' combined: 'I generally enjoy' and 'I always enjoy' being a clinical supervisor'

41% ($N = 31$) of those who did not want to be a clinical supervisor did not enjoy being a clinical supervisor, whereas 9% ($N = 19$) of those who wanted to be a clinical supervisor did not enjoy the role. Conversely, 59% of those who did not want to be a clinical supervisor, and 91% of those who did want to be a clinical supervisor, did enjoy being a clinical supervisor.

Chi Square test demonstrated that these differences are statistically significant $p < 0.001$ and that those who are interested in becoming a clinical supervisor are more likely to have greater enjoyment in their role.

Feeling supported by the practice

Cross tabulations were completed to test for associations between feeling supported by the practice and satisfaction as a clinical supervisor. Again, enjoyment of the role was grouped as above due to low cell counts. Feeling supported was also grouped as follows:

- 'Generally unsupported' combined: I feel 'unsupported', 'generally unsupported', and 'somewhat supported' in my role of clinical supervisor by the practice'
- 'Generally supported' combined: I feel 'supported' and 'generally supported' in my role of clinical supervisor by the practice. Of those who did not feel supported, 24% ($N = 42$) did not enjoy their role. However, 76% ($N = 136$) still did enjoy their role of clinical supervisor. Those who were supported reported higher levels of enjoyment with 93% ($N = 109$) enjoying their role and 7% ($N = 8$) not enjoying their role

Chi Square analysis demonstrated that there is a statistically significant relationship between these groups $p < 0.001$, with those feeling supported more likely to report higher levels of enjoyment.

Feeling supported by the college

Cross tabulations were completed to test for associations between feeling supported by the college or university that the clinical supervisor's student attends and satisfaction as a clinical supervisor. Again, enjoyment of the role and feeling supported was grouped as above due to low cell counts.

Of those that did not feel supported by the college or university, 24% ($N = 36$) did not enjoy their role and 76% ($N = 117$) did. However, 90% ($N = 128$) of respondents who felt supported enjoyed their role, with 10% ($N = 14$) still not.

Chi Square analysis demonstrated that there is a statistically significant relationship between the groups $p = 0.002$, with those who feel supported by the college or university being more likely to report that they enjoy their role.

Average numbers of students per clinical supervisor at one time

The median level of satisfaction for all numbers of students supported at a time was '(4) I am generally satisfied being a clinical supervisor' except for those that selected 6+ which was '(3) I somewhat enjoy being a clinical supervisor'. The relationship between the average number of students a clinical supervisor supported at any one time and their level of satisfaction in the role of clinical supervisor was not statistically significant $p = 0.422$.

Average numbers of students per clinical supervisor per year

The median level of satisfaction for all numbers of students supported in a year was '(4) I am generally satisfied being a clinical supervisor'. The relationship between the average number of students a clinical supervisor supported per year and their level of satisfaction in the role of clinical supervisor was not statistically significant $p = 0.394$.

Time provided or not provided

Cross tabulations were completed for allocation of time and level of enjoyment. Due to the variation in the number of hours allocated, this was split as 'time is provided,' or 'time is not provided'. Enjoyment was again grouped for this analysis due to low cell counts.

19% ($N = 38$) of those not provided time to complete clinical-supervision-related work did not enjoy their role, whereas 80% ($N = 160$) still did. 13% ($N = 12$) of those

who are provided time to complete clinical supervision related work did not enjoy their role, whereas 87% ($N = 84$) did.

Chi Square analysis showed that there was no statistically significant relationship between time allocated to the clinical supervisor to undertake their role, and if they enjoy their role, $p = 0.323$.

Discussion

SATISFACTION AND BARRIERS TO EFFECTIVE CLINICAL SUPERVISION

83% of participants stated that they 'fully' or 'generally' enjoy their role and 68% 'fully' or 'generally' agreed that clinical supervision enhanced the enjoyment of their professional role. This aligns with the findings of Part 1 of this study where only one respondent out of those no longer supporting students chose to do so due to the experience itself. Although this study identified key challenges that affected job satisfaction and 68% of respondents found the role challenging, the results demonstrate that clinical supervisors are happy in their role despite this. This is in alignment with the 2019 RCVS report on the veterinary nursing profession, whereby nurses were dissatisfied with the pay and remuneration of their role, but still satisfied overall (Robinson et al., 2019a).

Time was reported as the most challenging aspect of clinical supervision and 67% of respondents stated that they were not provided time to undertake clinical supervision activities. The provision of time was not correlated with satisfaction. Bifarin and Stonehouse (2017) noted how time pressures, significant case loads and staffing levels negatively affected the outcome of clinical supervision within human nursing. Assessing the impacts of the challenges of clinical supervision was beyond the scope of this study, therefore it would be prudent to explore this further in future studies. While supervisor satisfaction may be high, if the student experience is impacted, changes may be required.

The number of students allocated at one time and across one year was also not correlated to job satisfaction. However, only small numbers were reported at the high end of this variable. Those who reported supporting six or more students throughout a year were more frequently working within larger hospitals and with rotating students, suggesting an educational element to their role. The training centre overseeing the practice and the employer should ensure each clinical supervisor is able to meet the demands of the students under their supervision and recognise when a reasonable number is being breached. From this study, it appears as though this is being managed well and this is supported by Holt et al. (2021) who also reported an average of one student per clinical coach (clinical supervisor). Again, the impacts on the number of students a clinical supervisor has, correlated to student

progression and level of satisfaction, would be a future area of study.

Job satisfaction was, however, likely to be affected by how supported the person felt by the practice and college and/or university. If a clinical supervisor does not feel supported by either the practice or the teaching institution, they feel less satisfied in the role.

Colleges and universities have many resources, including human resources, in place to support clinical supervisors. However, perhaps this is not being communicated efficiently or clinical supervisors may not have the time to view them and contact staff for support. A two-way approach following this study would be beneficial. Firstly, for clinical supervisors to know that the teaching institution is there to support them and, in return, the teaching institution could review the accessibility of their support services and liaise directly with their constituents as to how they would like to be supported. This may also open channels of communication, which was highlighted as an issue in the final question: 'is there anything else you would like to add'. 19% ($N = 11$) of respondents reported that there could be greater support for students and clinical supervisors from the teaching institution.

It would be for individual clinical supervisors to open discussions with the practice with regard to how they might feel better supported. Registered veterinary nurses should feel empowered to negotiate with employers to ensure efficient and effective working practices are in place and this extends to student supervision. This would also be true for the request for protected time, a higher wage or greater recognition of the role they are undertaking. While 54% of participants received no extra benefits for being a clinical supervisor, there is still a substantial portion of the population that does. Being a clinical supervisor requires an extra level of responsibility, an increased workload and it is not listed as an expectation within the respective codes of professional conduct, as it is for human nurses. If staff are not provided time to undertake this role within their working hours and their annual salary does not reflect this level of responsibility, then there should be a reward scheme in place.

A second recommendation for practices and individuals to discuss openly is the veterinary professional's willingness to become a clinical supervisor. Those who did not want to become a clinical supervisor were more likely to report lower levels of satisfaction. Again, whether this impacts efficiency or student outcomes is yet to be determined. However, it may be a factor that practices consider and should be explicit about when recruiting.

Overall, it is encouraging to see that clinical supervisors are satisfied and this is a positive message for the profession and its future students. A collaborative approach from the governing bodies, the training

providers, and the training practices to maintain these levels is required, with additional research to explore each factor raised in this study, correlated to student satisfaction and outcomes. Steps are being taken, such as the formation of a veterinary nursing educators' network by the BVNA and continued congresses for clinical supervisors, to unite the voices of the profession. However, the momentum must continue; improved educational practices from happy workforces are required for lifelong learning and, ultimately, improved animal welfare – which is what all veterinary professionals should be striving for.

Conclusions and future research

Overall, this study has explored a range of topics within clinical supervision which, as a baseline study, will be of use and interest to all within the profession. As discussed throughout, there is a lack of data in the field, therefore further research is required to make inferences or any solid recommendations in relation to student progression. However, this study has highlighted some of the many positives and key challenges of the role which should be considered. Satisfaction and confidence have been found to be high within the participants of the study which is promising, as clinical supervisors are the role models for the future of our profession on their route to registration.

Limitations

One consideration of this study that must be noted is the potential for selection bias, as those interested in clinical supervision may have been more likely to complete the survey. This selection bias may also have affected other aspects of the study, as those more interested in clinical supervision may have a more positive outlook on the topic.

Furthermore, while the number of clinical supervisors, including those who have left the profession, is unknown at the time of publication, when compared to the ten responses from the training providers, the response rate for this study would have been low. This may have led to the low participant responses in some

fields of analysis and therefore the statistical tests, presented in Part 2 and Part 3 of this study, may have lacked power to identify significant differences between variables, or effects may have been extrapolated due to these small numbers. To overcome this, variables were grouped where indicated. However, in some cases, low numbers remained or grouping was not appropriate to achieve the objective.

Finally, the authors of this study work in education and while they do not have any input into the clinical experience of SVNs, conclusions may have been unconsciously biased towards their experience of higher-education teaching.

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Reflective professional development notes. To access hyperlinks to the references, scan the QR code on page 3.

Part 1

Part 2

Part 3

From rabbits to referrals

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SVN

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Nia is a final-year student veterinary nurse, completing a BSc (Hons) Veterinary Nursing with Small Animal Rehabilitation at Harper Adams University. She completed a placement year at Aberdeen Veterinary Referrals. At home, she enjoys volunteering at her local RSPCA and fostering rabbits.



Introduction

Before I started my vet nurse training, I wanted to support my local RSPCA. There are different ways of supporting local charities, from spending time at the centres supporting staff to fostering animals before they go to their forever home. Fostering can be incredibly rewarding as the animals are often traumatised, either physically or mentally, but often improve within a few days to become inquisitive and more confident.

Fast forward to my training at Harper Adams University, and the selection of my year-long placement. This can be a stressful time for students, with the worry that the practice will not be as expected, that we might not fit in with the team, or that the practice doesn't see the kind of patients we're interested in. Making a choice between first opinion and referral practice can be daunting. It is well known that referral practice can be a stressful place to work but you can focus on specific types of patients, whereas with first opinion practices you have the opportunity to see a wide range of interesting cases.

My story

There's no doubt that I'm the definition of an animal lover. At six years old, I decided I wanted to work with animals. Since then, it's been my goal to help as many animals as possible. I'm excited to qualify as a registered veterinary nurse (RVN) and will hopefully work in a referral practice, while continuing to volunteer and foster. I believe this is the best way to help as many animals as I can.

Volunteering

I started volunteering at Bryn y Maen RSPCA, North Wales, in 2009 when I was 10 years old. Being there was the highlight of my week. I never had pets, as my parents and sister were strongly against it and we enjoyed travelling so it wouldn't have been appropriate. Volunteering was a brilliant way for me to interact with animals and learn about all aspects of their care. I mainly volunteered in the small animal unit, helping with rabbits, guinea pigs, ferrets and all sorts of rodents and birds. I also spent some time socialising and walking dogs from the kennels.

Fostering

To become a fosterer, it's important to have the time to dedicate to the animals, an appropriate environment which is safe and stress-free, and an understanding of the species' needs. It was difficult to find time to volunteer during my GCSEs as the RSPCA was a 45-minute drive from home, although it may have helped me as I've always found exams stressful. During my first year of A-levels, I decided to foster rabbits so I could keep interacting with animals and still be of help to the RSPCA and the rabbits, but at my home.

It's been five years since I started fostering and I've had a total of 21 rabbits, all with very different characters. I often get asked, 'Why foster rabbits?' Just like dogs, cats and other domestic animals, rabbits can find it hard to trust people after having a rough life and they deserve a second chance.

They may come to me showing aggressive or territorial behaviour, or just be petrified of people due to their awful start in life, which makes them difficult to rehome. Once they're with me, they get one-to-one attention which brings out their real characters and that, in turn, helps them to be matched with the right owner. Within days of being with me, I often see a huge change in their characters: they become inquisitive and confident. When they start to trust me, I know we're on the right path.

Fostering rabbits is so rewarding and my ultimate goal is to get them ready for a permanent home. I really enjoy receiving updates from their owners once they are in their forever home.

I volunteer at the RSPCA whenever I'm home from university and foster when I'm home for long periods. It's always the first stop on the way home — even before I see my parents. Fostering is flexible so if I go on holiday the rabbit can go back to the centre. If I have a month at home, I can phone the RSPCA and ask if any rabbits need fostering, which they inevitably do. The most recent rabbit I've looked after is Michael, who came into my care because he was territorial and aggressive. He was with me for over three weeks before being placed in his forever home where he is now relaxed and happy (Figure 1).

'I got to see a wide range of orthopaedic, neurology, soft tissue, oncology, internal medicine and ophthalmology cases'

Placement in a referral

I'm not able to foster while I'm at university but I volunteer as much as possible during holidays and placement time. At the end of my first year of university, I had a ten-week placement at a first opinion practice on Anglesey and thoroughly enjoyed working there. For my placement year, however, I wanted to experience a referral hospital and was determined to get a place. I always push myself and I knew that if I didn't spend my placement year at a referral, I would never do it. Having looked through all UK referrals that are RCVS training practices, I shortlisted and applied to them. I was very happy when I got into my favourite choice: Aberdeen Veterinary Referrals in Scotland.

My placement at Aberdeen Veterinary Referrals was better than I could have imagined. I loved the case load and the people I worked with, and I miss everyone since coming home. I also enjoyed meeting the adorable patients and getting involved with the complex cases. I got to see a wide range of orthopaedic, neurology, soft tissue, oncology, internal medicine and ophthalmology cases.



Figure 1. Michael.



Figure 2 (above). Scrubbed nurse assists with draping a patient. Figure 3 (right). A Scrubbed nurse.



'I assisted as a circulating nurse and a scrubbed nurse, and carried out lab work and imaging'

I liked the variety of working in different aspects of patient care and in such amazing facilities.

My favourite cases were always the spinal patients. I particularly enjoyed being part of their rehabilitation, which involved physiotherapy. Some of these patients were hospitalised for several weeks, so I would form a good bond with them. It was so rewarding to see them, for example, go from being paralysed in their hind limbs to taking their first steps.

The biggest challenge while I was in Aberdeen was not being able to visit home due to the Covid-19 restrictions. Two days before heading home for Christmas, I found out I couldn't cross the border into England and then Wales. This meant having Christmas in my flat in Aberdeen instead of being with my family. Luckily, my flatmate couldn't return home either, so we had each other's company.

Charity work and referral work

Volunteering and fostering have helped me get to where I am now. I believe volunteering is something all students should do to improve their skills and plan their futures. It has helped me understand different species' needs and the best ways to care for them.

Working for a charity and working in a referral are complete opposites. Working with the RSPCA has shown the realities of how animals can be mistreated by owners, with most animals at the centre having experienced neglect or abuse. Referral, on the other hand, shows the best of owners who are doing everything they can for their pets. Working in a referral has given me a little glimpse of hope about how owners can be responsible and willing to look after their pets.

I doubt both areas will meet – via a referral for charities – due to the expense of the facilities and treatment. However, I will continue to volunteer when I'm an RVN in the hope that I'll be able to help the RSPCA through my nursing skills, and will use those experiences to further develop my abilities to help animals.

They also have a computerised tomography (CT), which I find fascinating, and a visiting magnetic resonance imaging (MRI). I have more of an appreciation for veterinary professionals than ever. The RVNs inspired me every day and I hope I'll be able to attain their extraordinary level of knowledge and skill.

I really liked that every day was busy and different, which added to the excitement. My role varied to ensure I got the most out of my placement. Generally, my work was divided between inpatients, theatre and diagnostics, and anaesthetics.

Inpatients

My role with inpatients included nursing patients in the kennel, cattery, medicine and isolation wards, as well as ensuring all animals had exercise, physiotherapy, bladder management (if needed) and their medications. It also involved updating owners on a patient's progress, as they were sometimes hospitalised for weeks.

Theatre and diagnostics

In theatre and diagnostics, I assisted as a circulating nurse and a scrubbed nurse (Figures 2 and 3), and carried out lab work and imaging (x-rays, endoscopy, CT). My anaesthetics role included monitoring during surgery and recovery for a wide range of procedures.

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BVNA Congress 2021

Research Bites is held during BVNA Congress and provides an opportunity for those who have undertaken research relevant to the veterinary nursing profession to showcase their findings in the form of posters and optional short oral presentations.

There are three categories

1. Research projects
2. Student veterinary nurses
– case reflection
3. Registered veterinary nurses
– case reflection



Research Bites is designed to provide a friendly and constructive platform for veterinary nurses and students to discuss and share best nursing practice, while increasing the evidence base available to the profession.

Over the next few issues, we will be publishing the abstracts that were accepted for the 2021 Research Bites. The abstracts are a brief overview of the

submitted case or research and gives the judging panel a chance to review submissions and provide feedback. Once the abstract has been accepted, the next step is to design a poster to showcase the work. There is also an option to create a presentation to talk at BVNA Congress. We hope you enjoy reading through the abstracts and feel encouraged to have a go yourself this year.

2021 Winner: Best Poster

Management and awareness of canine epileptic pets – are veterinary clients sufficiently supported?

**E. Clark &
L. Nuttall**

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Introduction

Epilepsy can be classified by its aetiology as reactive, acquired or idiopathic (Stafstrom, 2014). It is defined as a disorder of the brain which is predisposed to producing epileptic seizures and is the most common chronic neurological disease in dogs (Chandler, 2006).

Veterinary professional (VP) knowledge, effective communication, and client support and guidance are paramount to ensure clients are properly educated to feel able to make informed choices regarding their epileptic pet's treatment, and that they can acknowledge when to seek veterinary advice (RCVS, 2020; Wager, 2011).

Research objectives were to investigate client awareness of canine epilepsy and recognition of pre-ictal symptoms, and to investigate whether clients feel adequately supported by VPs.

Methodology

Two comparable questionnaires targeting VPs and owners of epileptic dogs were developed using an online survey platform. A convenience sampling approach was used to gather data by distributing surveys on social media via relevant Facebook pages such as Veterinary Nurse Chatter and Canine Epilepsy UK. Data collected was analysed using Excel and GenStat 19th edition. Statistical tests such as the Pearson's Chi-Squared and permutation test was conducted to investigate associations between demographic factors and epilepsy support provided.

Results

There were 279 responses to the client questionnaire and 83 responses to the VP questionnaire.

The survey results showed significant associations that suggested both VPs and clients rated the level

of epilepsy support provided as satisfactory, but not excellent ($p = 0.012$). 44% of veterinary practices only provided verbal advice to clients and no other forms of communication. VPs and clients disagreed on how frequently non-verbal communication was used. VPs thought they provided more leaflets (18% vs 3%), written information (15% vs 2%) and phone-call check-ups (17% vs 12%).

There was a significant positive relationship found between clients who were provided with additional resources such as leaflets, and clients who rated epilepsy support as high ($p = 0.049$). There was also a positive statistical association between clients who felt there was a lack of epilepsy support provided and clients who expressed an interest in attending epilepsy nurse clinics ($p = 0.007$).

Conclusions

Most clients and VPs rate epilepsy support provided to clients with epileptic dogs as satisfactory. However, both VPs and clients still consider that clients with epileptic pets could be better supported, particularly practices without a neurology specialism. Support could be improved with VP engagement in epilepsy-focused professional development courses, epilepsy nurse clinics for clients to attend, and increased use of communication resources.

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2021 Winner: Best Presentation

The relationship between mean arterial blood pressure and end-tidal carbon dioxide in canines during general anaesthesia

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Introduction

Most pet dogs will undergo general anaesthesia within their lifetime. It is vital the veterinary team has knowledge and understanding of anaesthetic monitoring for healthy patient outcomes. Establishing a link between end tidal carbon dioxide (ETCO₂) and mean arterial blood pressure (MAP) could provide greater insight into patient stability and cardiac function during general anaesthesia, improving anaesthesia safety. This study aimed to distinguish if a relationship could be seen between ETCO₂ and MAP, with a linear relationship hypothesised.

Methodology

Twenty healthy canines (both genders, various breeds, aged between 7 months and 12 years) undergoing elective procedures were included. Requirements for enrolment included general anaesthesia \geq 35 minutes, with exclusion if IPPV or IVFT were required during the first 35 minutes. Premedication of buprenorphine and acepromazine maleate was administered 15 minutes prior to induction of general anaesthesia. Propofol was administered intravenously to effect for induction, and anaesthesia was maintained by isoflurane and oxygen.

Commercially available blood pressure cuffs were placed over the dorsal pedal artery. Sidestream capnography was attached between the endotracheal tube and anaesthetic circuit, connected to the same multiparameter as the blood pressure tubing. MAP was

measured every 5 minutes and ETCO₂ was continuous. Recordings were noted every 5 minutes, starting from 15 minutes anaesthesia time and concluding at 35 minutes. Statistical analysis used repeated measures ANOVA and Spearman's Rank Correlation Coefficient.

Results

Spearman's Rank Correlation Co-efficient showed no significant relationship between MAP and ETCO₂ ($p = 0.063$). Analysis showed no significant time interactions for MAP ($p = 0.298$) or ETCO₂ ($p = 0.387$). When comparing the two parameters in this way, MAP decreased during the first 20 minutes before increasing from 20 to 30 minutes, prior to falling at 35 minutes. This differed from ETCO₂ where values declined until 25 minutes, then increased to a level higher than first recorded; further evidencing the lack of unity between ETCO₂ and MAP.

Conclusions

To conclude, a linear relationship was not found between end tidal carbon dioxide and mean arterial blood pressure measured by non-invasive methods. However, many variables and reasons for this result, including pharmaceutical interactions, ventilation/perfusion ratio, and cardiac output have been explored in this study. This study has therefore demonstrated the importance of understanding the depth and mechanisms of these factors to ensure patient safety during general anaesthesia.



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