



Newsletter - Autumn 2024

Welcome to our Autumn newsletter
We hope you enjoyed the last edition and feel these are
an interesting read

As we head into the latter part of 2024 we are preparing to approach 2025 with a clear focus on development here are SCVS.

We hope you enjoy this season's content highlighting interesting cases, new areas of focus, advice and proposed CPD for 2025.

May we take this opportunity to thank you for supporting us with cases and attending our events.

What will you find in this issue?

[OA Clinic Success](#)

[Hyperkalaemia](#)

[SCVS Leadership](#)

[Neurology cases](#)

[SCVS CPD](#)



SOUTHERN COUNTIES
Veterinary Specialists



SCVS Leadership Team

We are excited to announce developments in SCVS Senior Leadership Team.

We are looking to head into 2025 with a strong positive focus on the growth and development of Southern Counties Veterinary Specialists.

Natalie Patten has stepped up to Hospital Director after 6 years as Hospital Manager, with Adam Auckburally BVSc PhD Cert VA Dipl.ECVAA PGCAP FHEA MRCVS and Florence Juvet DVM DipECVIM-CA MRCVS progressing into Clinical Director positions, both having been with the organisation holding diplomat and Head of Department positions for 7 and 13 years respectively.

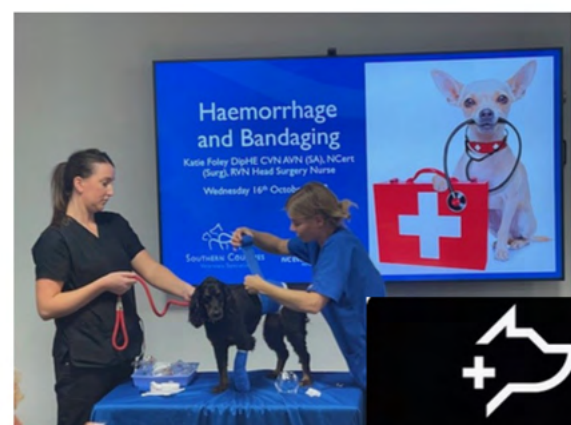
Pet Owner First Aid

In October we were delighted to host our first 'Pet Owner First Aid Course'. The feedback was outstanding and we are looking to host these quarterly.

If you have any owners who you feel may be interested, please ask them to contact us to be put on our waiting list.

Tobi Wagner Dip ECVIM-CA (Cardiology) Dr.med.vet. MRCVS continues as Clinical Director and Jo Webb BSc(honours) Grad DipVN AI RVN as Nursing Manager.

The new team formation is full of enthusiasm, clinical experience and passion for the success and growth of SCVS through the coming months and years.

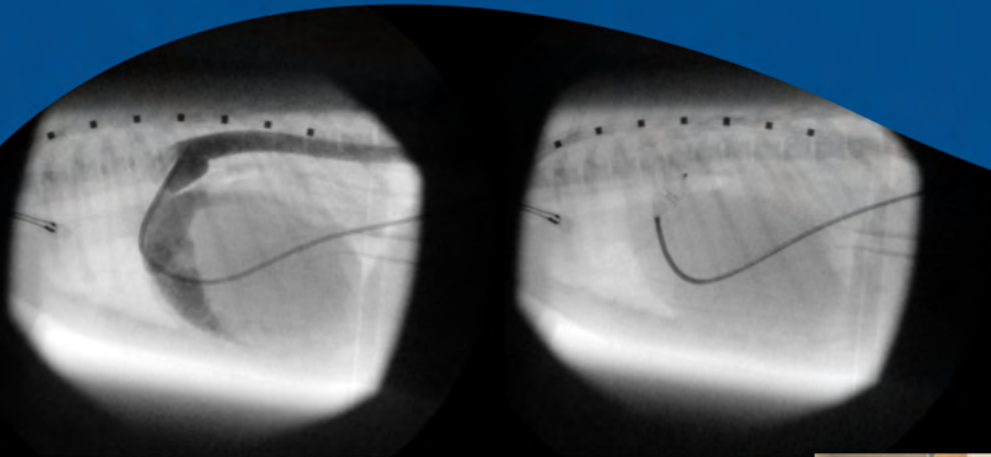


We propose to charge £10 per person for for future owner events and all the proceeds will be donated to Streetvet. Our next event will be held in January 2025.



SOUTHERN COUNTIES
Veterinary Specialists

Cardiology



Cardiology team closes PDA in tiny 900g dog

Size is not a limitation to the cardiology team at SCVS. This month, we closed a PDA in a tiny puppy weighing only 900g!

The PDA is a persistent connection between the aorta and pulmonary artery which has not closed after birth. Untreated, it will result in left sided heart failure in many patients. The heart failure signs are usually difficult to control. Further, it can trigger changes in the pulmonary vessels resulting in severe pulmonary hypertension. Both scenarios have a huge impact on the patients' quality of life and will sadly lead to premature death. Treated early in life will, however, provide many patients with a completely normal life expectancy. Early diagnosis and treatment are therefore very important. Continuous heart murmurs which are typical for patients with a PDA should always prompt cardiac workup.

Despite the tiny patient size, PDA closure was achieved using minimally invasively via percutaneous puncture of the femoral vein. A special vascular plug (the Amplatz-Vascular-Plug-4, AVP-4) was then positioned in the PDA to occlude the flow in between Aorta and pulmonary artery which would otherwise result in heart failure at young age! We are very pleased with the outcome and speedy recovery and with Minnie all the best!



'I can't thank you guys enough for what you did for our Minnie and for Tobi and his team Minnie had to have heart surgery as she had a heart murmur at grade 6 and with her being such a tiny puppy we thought we were going to lose her but luckily the surgery worked and she now a normal puppy these guys really were amazing thank you for all did for us and Minnie'

Minnie's owners.



Osteoarthritis (OA) Clinic

Milo is a Labrador who recently started treatment with the new OA clinic set up here at SCVS by Andrea Galliano DVM MSci GPCertSAS DipECVS MRCVS and Andrew Gardener BSc (Hons) Physiotherapy MRes Clinical Research PGDip Veterinary Physiotherapy (ACPAT - Cat A). Launched to offer clients with dogs a multi-modal, non-surgical tailored management plan to help alleviate their symptoms of pain and lameness.

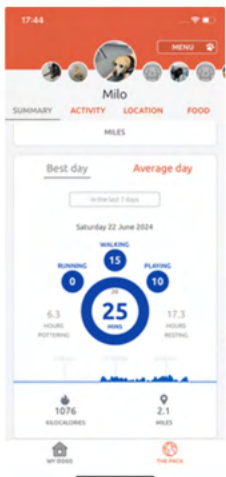
Managing OA is a complex process that can be effectively done with a variety of treatment approaches. For, Milo Andi and Andy carried out a combined veterinary and physiotherapy assessment of him and set up a 3 month plan that involved 'stem' cell therapy, laser therapy, diet management, therapeutic exercise, owner education along with a review of his medication. Symptoms are regularly monitored over this time and Milo's functional performance is continually tracked using activity monitor, a handy device we loan to all our OA patients so we can assess how much exercise they can productively do without aggravating their symptoms

In addition to this, all the dogs that attend the clinic have their gait assessed using the 'Gait4dog' pressure sensitive walkway on a fortnightly basis in order to check how much weight they are able to put through each limb. this allows us to objectively assess the effectiveness of our treatment approach and make any changes to it should it be needed.

When we first met Milo, it was clear that he was experiencing advanced osteoarthritic changes in both elbows causing him pain and discomfort. However, we are delighted that he has made significant progress and has been able to return to moderate levels of activity and his owner owner has reported an improvement in his overall willingness to engage in exercise and now enjoying the benefits of hydrotherapy with our team here at SCVS.

Milo is a beautiful boy and adored by his committed owners. We are delighted to see the positive changes that Milo is experiencing as a result of our OA clinic.

If you would like to find out more about how our OA clinics can support your clients, please contact us.



(Picture of GLS read out from walkway and digital paw tracking picture)



Google review
from owner:

Absolutely god damn amazing cannot fault any of the team from the specialists to the receptionists every single one of you have showed my Milo so much love! So beyond grateful you don't understand! He has a new lease of life and I am so grateful! Especially Katie the nurse and both the Andy's! Amazing amazing amazing thank you!

(Picture of pit pat monitor and data readout on app)

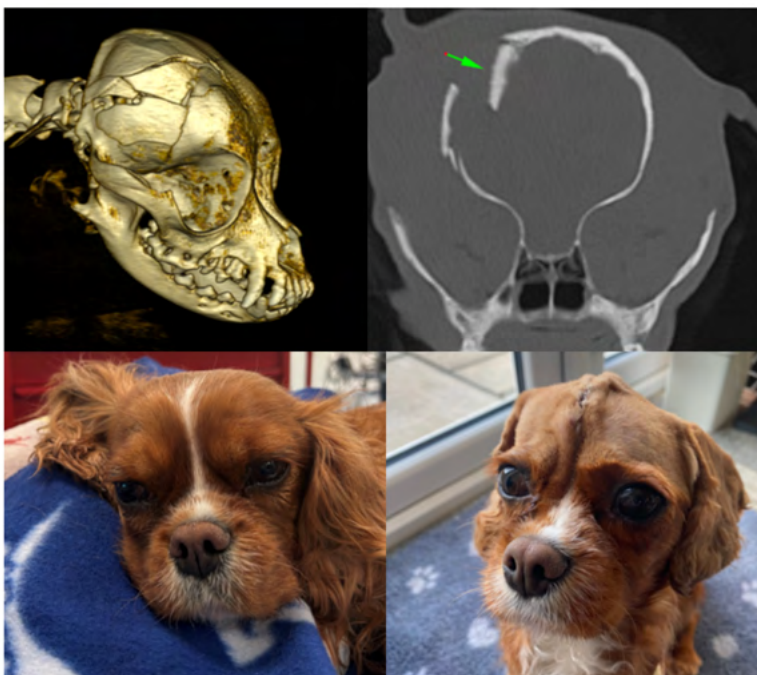


Neurology Cases

Maggie May came to our Neurology Department at SCVS as she was experiencing reduced use of all 4 of her legs, due to a slipped disc in her neck. To complicate Maggie Mays situation, she was suffering from advance breathing problems, due to laryngeal collapse. This put her at high risk for any anaesthesia intervention for investigations and surgery.

The combined work of our neurology, anaesthesia and soft tissue surgery teams, alongside the amazing job of our ICU nurses made the surgery and recovery of Maggie May possible.

Maggie May is now back enjoying life to the fullest with her lovely family in Cornwall, who had driven her all the way to SCVS to enable her to receive the advance care from our team.



Evie was presented as emergency at the neurology department unresponsive due to Head trauma.

A CT was performed and was indicative of multiple depressed fractures of the right part of her skull with a large fragment markedly displaced and penetrating the brain parenchyma.

Surgery was performed to remove the bone fragments and to repair the bone fracture.

Evie went home after a week from admission, and she is doing brilliantly.



Anaesthesia-induced hyperkalaemia

Derek Flaherty BVMS, DVA, Dipl. ECVAA,
MRCA, FHEA, FRCVS
RCVS and EBVS® Recognised Specialist in
Veterinary Anaesthesia and Analgesia
Professor of Veterinary Anaesthesia and
Analgesia

Hyperkalaemia (herein defined as plasma/serum potassium >5.5 mmol/L) is not uncommon in small animal practice and is classically encountered in urinary tract obstruction or rupture, as well as in some medical disorders such as hypoadrenocorticism (Addison's disease). Over the past few years, an increasing number of cases of unanticipated hyperkalaemia have been reported in healthy animals during general anaesthesia, with a significant contribution to this body of literature from the Anaesthesia team at Southern Counties Veterinary Specialists (Felisberto et al. 2020; Casoria et al. 2021; Gomez et al. 2022).

Having previously been described in large non-domesticated cats, the earliest cited case of anaesthesia-induced hyperkalaemia in small animals appears to have been in 2014 on an online blog called 'Greyhound articles online', where the owner of a Greyhound which died during anaesthesia and was found to be hyperkalaemic issued a warning to other owners of this breed to be aware of this possible risk. Subsequently, other authors also reported this condition in anaesthetised Greyhounds (McFadzean et al. 2018; Jones et al. 2019; Pye and Ward 2023), while a group from Colorado Vet School demonstrated that 38% of Greyhounds develop hyperkalaemia during general anaesthesia (Jones et al. 2018).

Since then, it has also been reported in other breeds of dog (Boustead and Zeiler 2019; Louro et al. 2020) and in cats (Felisberto et al. 2020; Casoria et al. 2021). The aetiology of anaesthesia-induced hyperkalaemia has not been elucidated to date, although some authors have suggested there may be an association with alpha-2 agonist (medetomidine/dexmedetomidine) premedication (Gomez et al. 2022; Yankin 2024); however, it has also been reported in patients receiving alternative premedication agents. The condition usually manifests some 60-120 minutes following induction of anaesthesia, and the first sign observed is typically bradycardia which is poorly/non-responsive to antimuscarinic therapy (atropine/glycopyrrolate); subsequently, characteristic ECG changes associated with hyperkalaemia begin to materialise.

Degree of hyperkalaemia	ECG changes
Mild (K^+ 5.5-6.5 mmol/L)	Spiked T waves; prolongation of the P-R interval
Moderate (K^+ 6.5 - 8.0 mmol/L)	Loss of P wave; widening of the QRS complex; possible appearance of ventricular ectopic complexes
Severe (K^+ > 8.0 mmol/L)	Widening of QRS complex, progressing to development of a 'sine wave' ECG; ventricular asystole or ventricular fibrillation

Table 1. Classical ECG changes associated with hyperkalaemia. Note that individual animals may not necessarily show all of these alterations, and also that the potassium level at which each ECG abnormality appears is not fixed and is probably more related to the rate of the increase rather than the absolute value.



Figure 1. ECG from a cat undergoing humeral fracture repair which developed unexpected hyperkalaemia during general anaesthesia (K^+ 7.8 mmol/L). The ECG shows bradycardia (39/min) and absence of P waves (atrial standstill).



Anaesthesia-induced hyperkalaemia

As soon as these changes start to appear, rapid deterioration in the animal may occur, with cardiac arrest a distinct possibility; consequently, it is imperative to measure plasma potassium without delay (if possible), although this author has started treatment for

hyperkalaemia in some cases while still awaiting the blood results due to the rapidity of progression of ECG changes and cardiovascular depression in some individuals.

Management of hyperkalaemia is outlined in Table 2 (below).

Drug/technique	Dose	Mechanism of action
Hyperventilation using positive pressure ventilation (PPV)	Reduce ETCO ₂ to ~30-35 mmHg (dog) or 25-30 mmHg (cats). Be aware that PPV may have adverse effects on haemodynamics which may already be compromised in hyperkalaemic patients.	By increasing pH, hyperventilation may drive K ⁺ inside cells (where it does not contribute to the plasma concentration). Effect is probably minimal.
Intravenous fluids	Bolus of 10-20 mL/kg Hartmann's solution or 0.9% NaCl.	Direct dilution of K ⁺ (plus other effects). Although Hartmann's contains some K ⁺ it is still less than the plasma concentration of a hyperkalaemic patient so will lower K ⁺ and is potentially more effective than 0.9% NaCl due to its alkalising effect.
Calcium gluconate (usual concentration is 10%)	0.5-1.5 mmol/L slow IV over 10 min (i.e. 0.5-1.5 mL/kg of the 10% solution)	Ca ²⁺ will not affect the actual K ⁺ concentration but helps to protect the heart against the effects of hyperkalaemia. It has a duration of ~20 mins which allows time for other treatments to lower the K ⁺ . Usually only given if significant ECG changes are present. Can be repeated if necessary.
Glucose (dextrose)-insulin	Glucose alone: 1 mL/kg IV bolus of 50% solution diluted 1:5 with 0.9% NaCl followed by an infusion of 2.5% glucose at maintenance rates. (50ml of 50% glucose in 1 L = 2.5%). or Soluble insulin (aka regular or neutral): 0.25 U/kg IV + 2 g glucose/U insulin IV (4 ml 50% glucose/U diluted as above) followed by an infusion of 2.5% glucose at maintenance rates.	Insulin stimulates K ⁺ influx into cells. Glucose is co-administered to prevent hypoglycaemia (although this can still occur and blood glucose must be measured frequently if this treatment modality is used). Glucose can also be given by itself and will stimulate endogenous insulin release, but is generally less effective than combined insulin-glucose.
Sodium bicarbonate (various concentrations but 8.4% most common)	1-2 mmol/kg slow IV (the 8.4% solution contains 1 mmol/mL). Hyperosmolar so requires dilution (1:5 with 0.9% NaCl or 5% glucose).	Alkalinisation drives K ⁺ into cells. Not commonly used unless there is a pre-existing metabolic acidosis as bicarbonate is not without potential adverse effects.
Terbutaline	0.01 mg/kg slow IV or IM.	Beta-2 agonists drive K ⁺ into cells. May cause tachyarrhythmias.
Inhaled beta-2 agonists (e.g. salbutamol)	? 2-3 puffs delivered via a spacer (Aerokat/Aerodawg) attached to the endotracheal tube.	Beta-2 agonists drive K ⁺ into cells. Current lack of published evidence of efficacy in treating hyperkalaemia in animals (but see note in text).



Figure 2. AeroKat inhaler spacer attached to an endotracheal tube to deliver aerosolised beta-2 agonist (in this case salbutamol).

Alongside the 'standard' treatments for hyperkalaemia, the use of inhaled beta-2 agonists (bronchodilators) for its management has become commonplace in human medicine but has not yet been reported in animals; however, we have recently used this technique successfully in 2 cases of hyperkalaemia in dogs at Southern Counties Veterinary Specialists (and are in the process of submitting this for publication), and one of our team has also had a positive result with it in a hyperkalaemic horse.

Administering inhaled beta-2 agonists is an easy (see Fig 2) and relatively innocuous procedure, and is likely to become the first line approach to hyperkalaemia in anaesthetised patients in our practice due to the rapidity with which it can be administered while we are potentially preparing other treatments; however, further research is required in animals before we can routinely recommend it to our external colleagues.

Take home messages

- Anaesthesia-induced hyperkalaemia is not uncommon in otherwise healthy anaesthetised dogs and cats, with the precise cause unknown.
- When it occurs, it usually becomes apparent around 60-120 minutes following induction of anaesthesia.
- Greyhounds may be predisposed, and it is probably worthwhile routinely measuring plasma potassium in this breed during anaesthesia, even in the absence of signs of hyperkalaemia. It is possible that the aetiology of the condition differs between Greyhounds and other breeds, but the treatment remains the same.
- Monitoring with an ECG provides the earliest indication that hyperkalaemia might be developing.
- Rapid treatment is essential to prevent cardiac arrest.
- The condition is almost certainly underdiagnosed in first opinion practice due to a lack of awareness of its existence and somewhat limited use of ECG monitoring during anaesthesia.

References

1. Greyhound Articles Online. High potassium during anesthesia causes sudden Greyhound death. Available at: greyartcles.wordpress.com/medical-first-aid/anesthesia-surgical/high-potassium-during-anesthesia-causes-Greyhound-sudden-death/. Published online February 12, 2014; accessed June 14, 2024.
2. McFadzean W, Macfarlane P, Khenissi L and Murrell JC. Repeated hyperkalaemia during two separate episodes of general anaesthesia in a nine-year-old female neutered greyhound. *Vet Rec Case Rep.* 2018; 6(3): e000658.
3. Jones SJ, Mama KR, Brock NK and Couto CG. Hyperkalemia during general anaesthesia in two Greyhounds. *J Am Vet Med Assoc.* 2019; 254(11): 1329-1334.
4. Pye E and Ward R. Hyperkalaemia in a greyhound under general anaesthesia. *Vet Rec Case Rep.* 2023; 11(2): e585.
5. Jones SJ and Mama KR. Prevalence of hyperkalemia during general anaesthesia in Greyhounds (abstr), in Proceedings. Association of Veterinary Anaesthetists Spring Meeting 2018;75.
6. Boustead KJ and Zeiler G. Life-threatening hyperkalaemia in a five-year-old rottweiler undergoing bilateral elbow arthroscopy. *Vet Rec Case Rep.* 2019; 7(3): e000893.
7. Louro LF, Raszplewicz J and Alderson B. Hyperkalaemia during general anaesthesia: six cases. *Vet Rec Case Rep.* 2020; 8(3): e001075.
8. Felisberto R, Auckburally A & Flaherty D. (2020). Life-threatening hyperkalaemia during general anaesthesia in a domestic short-haired cat. *Veterinary Record Case Rep.* 2020; 8(4): e001243.
9. Casoria V, Flaherty D and Auckburally A. Hyperkalaemia during two consecutive anaesthetics in an aggressive Bengal cat. *Veterinary Record Case Rep* 2021; 9(3): e137.
10. Gomez AG, Auckburally A and Bettshart-Wolfensberger R. Unexpected hyperkalaemia in an anaesthetised calf undergoing umbilical fistula resection. *Veterinary Record Case Rep.* 2022; 10(2): e351.
11. Yankin I. Hyperkalemia Associated with General Anesthesia in Dogs and Cats <https://vetemcrit.com/hyperkalemia-anesthesia/>



SOUTHERN COUNTIES
Veterinary Specialists

CPD At SCVS

Canine Urinary bladder tumours - Free

Join Charlotte Johnston DVM M VetSc DipACVIM (Oncology) PgCertVetEd FHEA MRCVS, American Diplomate in Veterinary Oncology.

Wednesday 27th November 2024 [Secure Your Place](#)

Practical Echo Clinics - £375pp

Join Tobi Wagner Dip ECVIM_CA (Cardiology) Dr.med.vet MRCVS for small group practical sessions tailored to your individual needs. We will cover how to obtain the standard views with echocardiography that will aid decision making in day-to-day clinical practice.

Current Availability:

11th March 2025 [Secure Your Place](#)

1st July 2025 [Secure Your Place](#)

11th November 2025 [Secure Your Place](#)

Film Reading Night - Free

Join Beatriz Monreno DipECVDI MRCVS and our imaging team for an informative evening discussing challenging radiographic cases.

Tuesday 14th January 2025 Booking available shortly on our website / Eventbrite

When things go wrong in anaesthesia..." - Free

Join Derek Flaherty BVMS, DVA, DipECVAA, MRCA, FHEA, FRCVS as we look at the common complications that can occur during anaesthesia, and how to deal with them without getting stressed.

Thursday 27th February 2025 Booking available shortly on our website / Eventbrite

Test Your Echo Interpretation - Free

Join Tobi Wagner Dip ECVIM-CA (Cardiology) Dr.med.vet. MRCVS, Head of Cardiology at Southern Counties Veterinary Specialists for an interactive CPD session which will aim to test your echo interpretation skills.

Tuesday 21st January 2025 [Secure Your in Person Place](#)

Tuesday 29th April 2025 [Secure Your In Person Place](#)

Tuesday 30th November 2025 [Secure Your In Person Place](#)

