VET nuus•news

Oktober / October 2026

The Monthly Magazine of the SOUTH AFRICAN VETERINARY ASSOCIATION
Die Maandblad van die SUID-AFRIKAANSE VETERINÊRE VERENIGING



THEME

Reunion: Class of 86

SAVA
South African Veterinary Association
Suid-Afrikaanse Veterinêre Vereniging

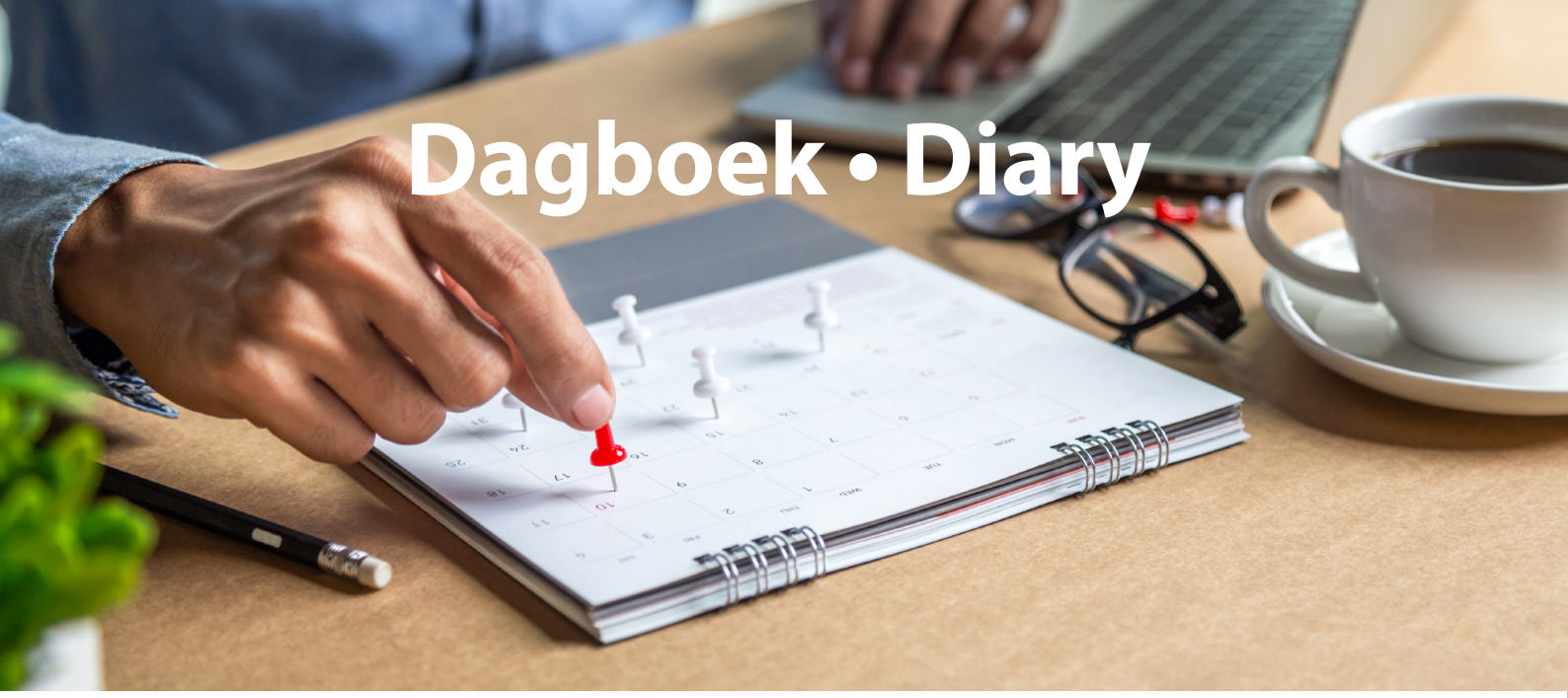
CPD

From Coop to Kitchen: The Veterinarian's Role in Food Safety in Backyard Poultry Flocks

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https://www.sava.co.za/vetnews-2026/



Dagboek • Diary

Ongoing / Online 2026

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SAVA Johannesburg Branch CPD Events
Monthly - please visit the website for more info.
Venue: Johannesburg Country Club
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CPD Course: Introduction to Animal Welfare Science
Online - self paced.
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CPD Course: Animal Research Ethics
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November 2026

Southern Cape Branch of the SAVA Congress
06 – 07 November
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Poultry Group of SAVA
11– 13 November
Venue: Kopanong Hotel & Conference Centre, Benoni
Info: corne@savetcon.co.za

February 2027

SAEVA Congress
18 – 21 February
Venue: Lagoon Beach Hotel, Cape Town
Info: Vetlink on conferences@vetlink.co.za





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Contents I Inhoud

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Diary / Dagboek

II Dagboek • Diary

Regulars / Gereeld

2 From the President
6 Editor's notes / Redakteurs notas

Articles / Artikels

10 Forty Years Later: The Onderstepoort Class of 1986 Reunites
15 Foot-and-Mouth Disease: Getting the Response Right to Protect Southern Africa's Food Security
19 Enucleations performed by the ophthalmology service have lower complication rates...
27 First report of traumatic myiasis in the wild Komodo dragon from Indonesia
31 SD-OCT diagnosis of optic nerve head drusen and pseudopapilledema associated with advanced chorioretinopathy in a dog: case report
37 Yarns – Part 4 of 10: The lonely heifer

Association / Vereniging

38 SAVA News
41 In Memoriam

Vet's Health / Gesondheid

42 Life Coaching

Technical / Tegnies

44 Ophthalmology Column

Marketplace / Markplein

46 Marketplace

Jobs / Poste

48 Jobs / Poste
49 Classifieds / Snuffeladvertensies







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Progress Since Our Last Federal Council Meeting

Dear members,

In this month's foreword, I'd like to present progress since our last FEDCO meeting. Below, please see the report presented to FEDCO.



1. Introduction

The period since the previous Federal Council reporting cycle has been characterised by continued organisational consolidation, active professional advocacy, regulatory engagement and increased collaboration across the veterinary and animal health sectors.

SAVA continues to operate in a demanding environment. The ongoing Foot and Mouth Disease (FMD) crisis, veterinary pharmaceutical shortages, regulatory changes, financial sustainability challenges, workforce development gaps and changing expectations of the profession have all required sustained attention.

At the same time, important progress has been made. The Association has strengthened its engagement with key regulatory and industry stakeholders, including the South African Health Products Regulatory Authority (SAHPRA), advanced several professional and animal health matters, continued the process of financial and organisational stabilisation, and created new opportunities for collaboration across the veterinary value chain.

During this period, SAVA has also focused on strengthening the interface between the Association and its members. Improvements to the SAVA website are underway to enhance accessibility, communication and the overall member experience.

The work undertaken during this period has once again demonstrated the importance of a strong, credible and inclusive professional association that is able not only to represent its members, but also to contribute constructively to animal health, animal welfare, public health, food security and the sustainability of veterinary services.

2. Governance, Organisational Stability and Strategic Direction

The Board has continued to focus on strengthening SAVA's governance arrangements, organisational stability and long-term financial sustainability.

Work on the review of the Memorandum of Incorporation (MoI) and the broader governance relationships between SAVA, its affiliates, groups and related entities continues. The MoI is currently under legal review and will be shared with members in preparation for the Annual General Meeting. The implementation of the performance management system has contributed significantly to strengthening accountability, delegation and clarity of roles and responsibilities within the Association's Secretariat.

Further consideration is also being given to the staff complement, to ensure that SAVA operates with a lean, sustainable and appropriately structured staff complement that remains capable of delivering on the Association's mandate.

The postponement of the SAVA Annual General Meeting was necessitated by administrative matters requiring finalisation, including completion of the audited financial statements and proposed amendments to the MoI to ensure alignment with the relevant regulatory framework.

The Board of Directors has subsequently resolved that the AGM will be held on 5 December 2026. Members will be formally notified and all relevant documentation circulated within the prescribed timeframes.

There have also been changes in the composition of the Board. Following the resignation of Dr Jana Prinsloo, two interim Board members, Prof Ivan Lwanga-Iga and Dr Ingrid Arnold, were appointed. These appointments ensure that the Board continues to function in accordance with the requirements of the organisation's MoI.

I would like to thank Dr Arnold and Prof Lwanga-Iga for their willingness to serve SAVA during this period.

3. Financial Sustainability and Organisational Recovery

Financial sustainability will remain one of the Board's highest priorities over the next few years. The objective must be for SAVA not merely to achieve break-even, but to progressively rebuild its financial reserves and strengthen its longer-term resilience.

Robelli Accountants continue to support the strengthening of financial systems and reporting, with increased attention also being given to the financial management and oversight of affiliates and related entities.

Despite support from the SAVA Board and the implementation of cost-containment measures, including downsizing, SAVETCON did not achieve the required financial turnaround. As a shareholder, SAVA faced continued exposure to financial liability should the entity remain unsustainable. The Board therefore resolved to disengage from SAVETCON and sell the business.

VetHouse is also gradually being transformed into a vibrant hub of business activity while retaining its veterinary identity. We anticipate that SASVEPM will soon occupy some of the currently vacant space. This represents an important collaborative opportunity. SASVEPM is a key stakeholder with a substantial membership of state veterinarians, and closer proximity between the two organisations provides an opportunity to strengthen collaboration, build trust and explore areas of mutual interest.

>>>3

The outstanding HWSETA matter remains under engagement. SAVA continues to pursue payment of the final tranche of funding. Several meetings have been held with HWSETA, and the expectation is that the outstanding tranche will be paid before the end of the HWSETA financial year.

Membership subscriptions remain fundamental to SAVA's financial sustainability. It is therefore essential that we continue simultaneously to strengthen the value proposition for members and encourage members to remain in good standing.

4. Membership, Member Value and Organisational Relevance

During the reporting period, the Association continued to record new members, reinstatements, CCS veterinarians and cadet members, while also experiencing resignations and temporary suspensions. These trends underline the need to focus not only on recruitment, but equally on retention.

Our value proposition must increasingly respond to the diverse realities of veterinarians working in private practice, government, academia, industry, wildlife and other sectors. Professional development, practice support, wellness, advocacy, communication and opportunities for meaningful professional participation must all form part of this offering.

The decision to discontinue the printed edition of VetNews formed part of the wider cost-containment programme. We recognise that this affects the small number of members who continue to prefer the printed format and apologise for the inconvenience. The digital format, however, allows the Association to maintain regular communication while managing production and distribution costs responsibly.

Members have also expressed a need for shorter and more regular communication from SAVA regarding the work being undertaken by the Board, committees and other structures. The Board has therefore increased the frequency of communication with members, and the response to this change has been encouraging.

This approach will continue. At the same time, much of SAVA's advocacy takes place behind the scenes and often requires several rounds of engagement before an outcome is achieved. The Board must therefore strike an appropriate balance between keeping members informed and managing expectations, particularly where premature communication of initiatives that have not yet been concluded may result in disappointment or unnecessary loss of confidence.

5. SAVC Engagement and Professional Advocacy

The restoration of a functioning South African Veterinary Council has been an important development for professional stability.

SAVA's representative on Council, Dr Leon de Bruyn, has been appointed to the SAVC Executive and continues to provide an important link between SAVA and the regulatory environment. We welcome his reports and the willingness demonstrated by the SAVC and its Executive to engage constructively with SAVA.

During this period, SAVA held two important engagements with SAVC at which a range of professional and regulatory issues were discussed. These included the scope of practice of veterinarians and para-veterinary professionals, the reporting and prosecution of lay persons performing veterinary procedures, the administration and sale of scheduled medicines, complaints and investigation processes, professional accountability and related regulatory matters. These meetings were followed by written submissions to SAVC. We look forward to continued collaboration and to achieving progress in resolving challenges in these areas.

Discussions regarding tariff guidelines have also highlighted the importance of ensuring that any guidance issued by professional structures complies with competition law. The SAVC Executive has agreed to participate in a joint engagement with the Competition Commission to take this matter forward. This represents an important development.

Our approach remains one of constructive but principled engagement: supporting effective regulation while ensuring that legitimate concerns raised by members receive appropriate attention.

6. Foot and Mouth Disease and Animal Health Advocacy

Foot and Mouth Disease remains one of the most significant animal health challenges confronting South Africa and has required substantial input from the SAVA Board, RuVASA, the Veterinary Wildlife Group and individual veterinary professionals.

SAVA's central position has been that veterinary expertise must remain integral to national disease-control policy and implementation, and that private veterinarians should be appropriately recognised as an essential component of the national animal health system.

The Association, together with RuVASA and the Veterinary Wildlife Group, has engaged extensively on the evolving regulatory environment for FMD control and vaccination.

The consistent objective has been to support an approach that is legally sound, scientifically defensible and practically implementable, while also ensuring clarity regarding the responsibilities and potential liabilities of veterinarians participating in disease-control programmes.

A significant development has been the Veterinary Wildlife Group's position statement on FMD vaccination in wildlife. The statement supports access to FMD vaccination for susceptible managed and free-living wildlife under veterinary oversight, with individual traceability where practical and feasible, appropriate official notification, and active monitoring where required and feasible.

SAVA has also continued to participate in discussions, workshops and symposia addressing FMD epidemiology, diagnostics, vaccination, surveillance, biosecurity and risk analysis.

These engagements reinforce the need for a coordinated national response involving government, private veterinarians, organised agriculture, producers, researchers and industry.

7. Animal Health Legislation and Regulatory Reform

SAVA, together with RuVASA and the Veterinary Wildlife Group, submitted comments on the proposed Animal Health Regulations and the underlying Animal Health Act. While SAVA supports the modernisation of South Africa's animal health regulatory framework, concerns have been raised regarding the sequencing of legislative instruments, implementation capacity and the need for an integrated and nationally coordinated animal health system.

Our submissions continue to emphasise modern, risk-based disease management; stronger public-private partnerships; One Health principles; improved surveillance and traceability; appropriate consideration of wildlife health; and stronger coordination between agencies responsible for national biosecurity and border management.

SAVA will continue to engage with government to support a regulatory framework that is scientifically robust, operationally realistic and capable of strengthening veterinary services and national animal health.

>>>4

8. Veterinary Pharmaceuticals and SAHPRA Engagement

The availability of essential veterinary medicines remains an important concern for the profession.

The shortage of phenobarbitone preparations received considerable attention during the reporting period. SAVA engaged both the manufacturer and SAHPRA in seeking practical solutions while recognising the regulatory requirements associated with medicine manufacture, quality, registration and supply.

The subsequent engagement with SAHPRA was positive. SAHPRA addressed the Sedabarb supply challenge, and product availability has improved.

Importantly, further engagement with SAHPRA resulted in agreement in principle to establish a joint technical working group to address veterinary pharmaceutical matters of mutual concern. SAVA has been tasked with developing the Terms of Reference for this structure.

The proposed working group provides an opportunity to move away from responding to individual crises towards structured and sustained engagement on veterinary medicine availability, compounding guidelines, regulatory processes and other challenges affecting veterinary practice.

This represents an important achievement and an encouraging development that the Board of Directors is pursuing with urgency.

I would like to thank all stakeholders who have contributed to these engagements.

9. Education, Mentorship, Young Veterinarians and Wellness

The sustainability of the profession depends on an appropriately trained veterinary workforce, meaningful professional development pathways and effective support throughout a veterinarian's career.

The Education Committee continues to engage with developments relating to proposed new veterinary schools.

SAVA's role must be to ensure that any expansion of veterinary education gives appropriate consideration to competencies, quality standards, curriculum design, clinical exposure, workforce requirements and the sustainability of employment opportunities within the profession.

The BFAP study was shared with FEDCO, and members were encouraged to engage with its findings so that SAVA's discussions and positions in this area are informed by reliable data and evidence.

The mentorship programme remains an area requiring reconsideration. Experience with the previous HWSETA funding model demonstrated the risks associated with uncertain and delayed project funding.

Sustainable alternative models must therefore be explored for supporting young veterinarians, CCS veterinarians and, potentially, the wider veterinary and para-veterinary team.

Veterinarian wellness remains equally important. Engagement with pet insurance companies has identified a potential opportunity to collaborate around an existing veterinarian wellness programme. This requires further development but may become one component of a broader and more sustainable SAVA wellness offering.

Both mentorship and wellness require strong leadership and dedicated champions. Dr Ingrid Arnold has demonstrated a keen interest in supporting younger veterinarians, and we welcome her willingness to assist. We look forward to the development of a robust programme in this area.

10. Para-Veterinary Professionals and the Veterinary Team

SAVA continues to recognise the importance of appropriately integrating para-veterinary professionals into the broader veterinary team.

Engagement with the World Veterinary Association and the South African Association of Animal Health Technicians has explored how veterinary para-professionals can be integrated more effectively into veterinary service delivery while maintaining clearly defined scopes of practice, appropriate veterinary oversight and complementary competencies.

Engagement on the Memorandum of Understanding is nearing completion, with a final meeting anticipated in October. The MoU will provide an important framework for future collaboration.

This work is increasingly important as South Africa considers how best to utilise the available veterinary workforce while maintaining professional standards and appropriate levels of veterinary care.

11. Animal Welfare and Ethics

SAVA continues to engage on matters where animal welfare, legislation, professional responsibility and societal expectations intersect.

The Association has addressed the transportation of livestock by sea for slaughter at destination, informed by a member poll as well as input from the Animal Ethics and Welfare Committee and veterinarians with relevant expertise.

While recognising the existing legal framework, SAVA continues to support appropriate veterinary involvement and oversight and the development of alternatives that advance animal welfare.

The Association has also released an updated position relating to non-therapeutic tail docking in canine puppies.

The Animal Ethics and Welfare Committee has submitted revised Terms of Reference to FEDCO for consideration.

12. Antimicrobial Stewardship

Antimicrobial stewardship remains an important professional responsibility and an area in which veterinarians have a central leadership role.

SAVA continues to promote responsible antimicrobial use across animal health and production systems.

During the reporting period, the SAVA President participated in the AFMA Congress panel on antimicrobial stewardship. This provided an important opportunity for direct engagement between the veterinary profession, regulators and the animal feed industry.

The focus must remain on the prevention of disease through good management and biosecurity; responsible and evidence-based antimicrobial use; reduction of unnecessary antimicrobial exposure; appropriate replacement strategies where scientifically justified; and continued veterinary oversight.

13. Stakeholder Engagement and Strategic Partnerships

Collaboration continues to be a central component of SAVA's work.

SAVA, RuVASA and the Veterinary Wildlife Group have engaged with Red Meat Industry Services to explore areas of mutual interest and potential partnership.

One of the matters under consideration is possible collaboration and funding towards the establishment of a veterinary-led Animal Health Forum.

The strategic value of such a forum remains evident; however, its mandate, composition, governance, affordability and relationship with existing structures must be clearly defined before activation.

It is important that any such structure remains veterinary-led while enabling meaningful engagement with government, industry, producers and other stakeholders.

Engagement with pet insurance companies has also created potential opportunities around client education, social responsibility initiatives, CPD and veterinarian wellness.

These opportunities should be developed where they support SAVA's strategic objectives without compromising the Association's independence or its responsibility to members.

This is an area with considerable potential, and I am confident that the President-Elect will continue to develop these opportunities going forward.

14. Communication, Public Engagement and Visibility

SAVA has remained active in the public domain during this period despite limitations in staff capacity.

Media engagement has covered FMD, rabies, veterinary medicines, responsible animal ownership, pet care and other issues affecting animal health and the veterinary profession.

Various SAVA Directors have participated in numerous media interviews to ensure that the Association maintains visibility and remains available as a source of credible, scientifically sound information.

This public-facing role remains important in strengthening SAVA's position as a trusted professional voice.

15. Congress and Professional Platforms

Planning for the 2027 SAVA Biennial Congress has been discontinued, and SAVA will no longer host a Congress in 2027. This decision followed consideration of several factors, including financial viability.

The Board of Directors has resolved to engage members on various aspects relating to the future format and scheduling of SAVA congresses to ensure appropriate member buy-in and to support the future hosting of financially and professionally successful events.

We would like to thank everyone who has contributed to discussions and planning in this area.

In the interim, the SAVA Board is considering ways of strengthening the provision of scientific and technical support to members through webinars, short courses and other professional development platforms.

16. Recognition and Engagement with the Profession

SAVA continues to recognise and celebrate the achievements and contributions of members of the veterinary profession. As there will be no SAVA Congress in 2027, the Board will communicate a separate date and format for the 2027 SAVA Awards Ceremony.

Recognition of excellence remains an important component of strengthening professional identity, acknowledging service and celebrating the contribution of veterinarians across the profession.

17. Conclusion

The period under review has demonstrated both the complexity of the environment in which SAVA operates and the importance of sustained professional engagement. We continue to face significant financial, regulatory, organisational and animal health challenges. Nevertheless, tangible progress has been made.

Our experience over the past year has reinforced that meaningful progress requires persistence, technical credibility, collaboration and a willingness to engage constructively even where perspectives differ.

I would like to thank the members of the Federal Council, the Board of Directors, our committees, specialist groups, branches, representatives, VetHouse staff and the many individual members who continue to contribute their time, knowledge and expertise.

Much of this work happens away from public view - through meetings, submissions, consultations, regulatory engagements, legal reviews and technical discussions. It is nevertheless essential work. It ensures that the veterinary profession has a credible voice and that veterinary expertise contributes meaningfully to animal health, animal welfare, public health and food security.

I look forward to continuing this work together as we consolidate the progress made and position SAVA for the next phase of its development.

Groetnis!

Dr. Ziyanda Majokweni – Qwalela

President: South African Veterinary Association

South African Veterinary Association
Suid-Afrikaanse Veterinêre Vereniging

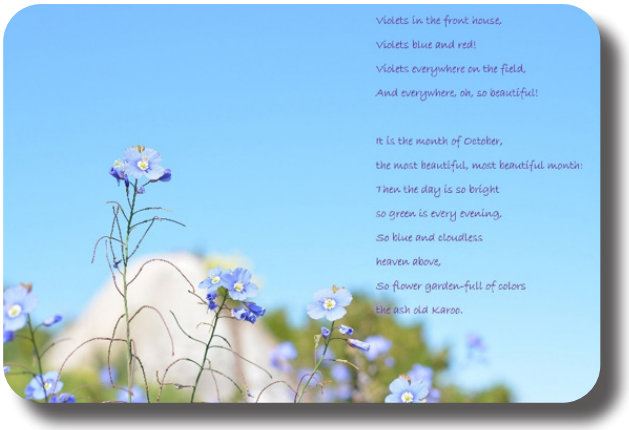


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Editor's notes / Redakteurs notas



This month's front cover may surprise some readers, as it does not look much like veterinary, but much more like news. Vetnews has the privilege of featuring, as its leading article, the 40-year reunion of the Veterinary Class of 1986. As with most things, it started when a group of classmates, colleagues and friends came together and hatched the idea of a reunion. This came to fruition in the week of 11 to 13 August. The details and the rest of the photos can be enjoyed later in the magazine. I hope that this inspires some other class groups to also send a call to gather and that Vetnews will be used as the vehicle to showcase the great get-togethers. If anybody needs tips on how to do this, the Paternoster Six are your guys.

Paul and I could not attend the reunion as we left for Europe and the UK on the 11th. We had the great privilege to see the Military Tattoo in Edinburgh. And what a show it was. If you were thinking of attending it at some stage. Do not wait; it is definitely worth the money and effort. At the same time, it is the Edinburgh Fringe Festival; therefore, be prepared for a hectically busy Edinburgh. We also saw the Ndlovu Youth Choir perform at one of the venues. A couple of very proud tears were shed. We also visited with our Ukrainian friends. Those who attended the opening ceremony of the World Vet Congress in Cape Town would remember their heartfelt presentation of animals in the War in Ukraine. Andrii has now been in the UK for several months, as he could not return to Ukraine to tend to his clinics and then go back to the UK to join his family there. It is a dire situation for them and especially frustrating as he can not practice as a Veterinarian in the UK. He has since returned to Ukraine, and we keep in touch. They get bombed continuously and have suffered severe damage to some of his clinics. He is currently treating a cat from which he extracted a bullet. Nothing is spared.

October is praised to be the most beautiful month in the words of the renowned Afrikaans poet C Louis Leipoldt, who celebrates the vibrant arrival of spring in South Africa, painting a rich picture of blooming landscapes, native wildlife, and the transforming Karoo. I know that there has been very unseasonable rain throughout the country, but I hope that your October is as vibrant and beautiful as Leipoldt describes it.

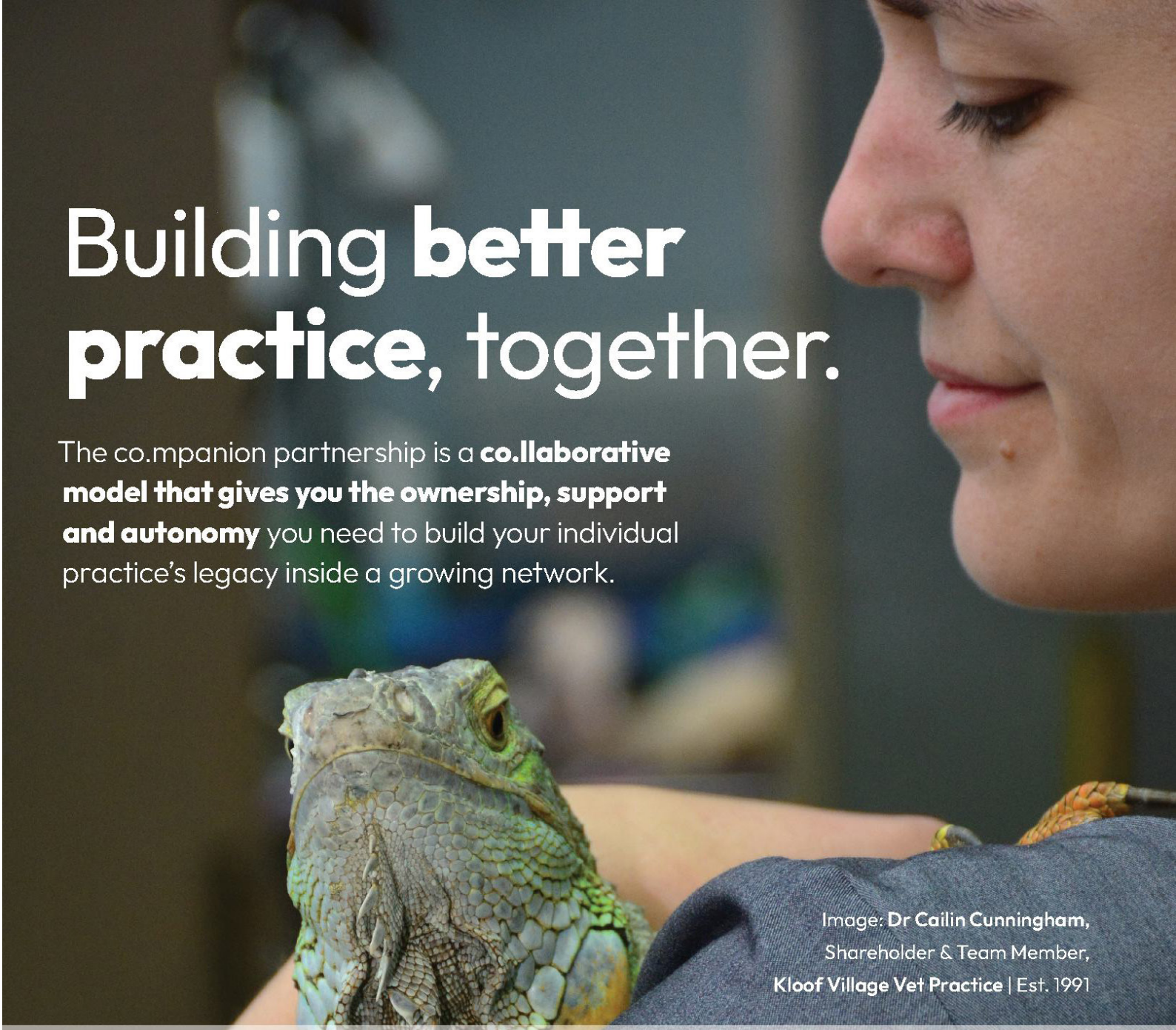
The themes covered in Vetnews this month include eye care, reptiles and Food security. There are some articles on all three subjects.

Next month will include a range of food-related articles, including diabetes and diets; it will also cover some information on men's health. The topic I know a specific male veterinarian will be looking forward to. If anyone has something to add to Vetnews on these topics, feel free to be in touch.

Have a great October (It is also Seniors month, so if you are a senior reader – enjoy your dedicated month)

Andriette





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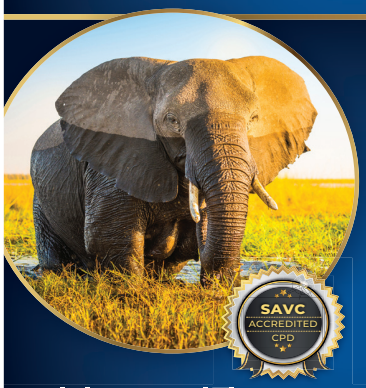
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FLTR David Watson, Dave Evezard, Julia Watson (front), Michelle Evezard, Santjie Pieterse, Amanda Neethling (front), Herman de Bruin, Judy Wright Sampson, Alan Kloeck, Steven Wimberley, Marion Booysen, Scott Elliot, Gerhard Giliomee (back), Marie Potgieter (front), Dries Lessing, Erica Lessing, David Shipster, Reiner Focke, Louis Bosch, Sue Shipster, Quixy Sonntag (front).

Forty Years Later: The Onderstepoort Class of 1986 Reunites



FLTR: Dr's Riaan Mulder, Gerhard Giliomee, Henry Labuschagne, Danie Odendaal, Deon van Tonder, Mark Chimes.

It all started with six classmates (later referred to as the "Paternoster 6") having a weekend together in Paternoster and sharing a few photographs on WhatsApp. The enthusiastic response from classmates planted the seeds for an "official" class reunion. A year later, thirty members of the 1986 Onderstepoort class, together with many spouses, travelled from across South Africa and abroad for an unforgettable four-day reunion in Paternoster — 40 years after they waved each other goodbye after graduating.



Marie Potgieter roped in the help of Jan Malan of The Koelkamers Teater, and they put together a programme of events. The little West Coast town turned out to be the perfect setting for four memorable days.

Die reünie het afgeskop met 'n skemeraand Weskus snoekbraai by die Paternoster Hotel.



Contingent enjoying the snoek braai op die first evening.

Daar was eers 'n bietjie senuagtigheid te bespeur. Hoeveel van jou klasmaats gaan jy herken na 40 jaar? Nuwe haarstyle (of 'n gebrek daaraan!) het sy uitdagings gebied, maar net 'n paar woorde was nodig om die ys te breek en weer name aan die gesigte te koppel. Die eerste aand is eers vroeg die volgende oggend by Paternoster se legendariese Panty Bar afgesluit. (*Apparently the photos were not suitable for publishing in a respectable magazine such as Vetnews – Ed*)

>>>10



FLTR: (Back) Deon van Tonder, Coen de Bruin, Judy Wright Sampson, Gerhard Neethling, Gerhard Giliomee, Francois Marais, Henry Labuschagne, Linda Jacobson, Quixi Sonntag; (Front) Sven Arp, Gary Bogner, Santjie Pieterse Fereira, Mark Chimes, Marisa Naude.

Forty Years Later... <<<11

The next three days offered a varied programme of activities, good food, fascinating talks and plenty of opportunities to catch up. Each day, breakfast and dinner were at a different venue, many in beautiful settings with a view over the coastline.



We had a guided village walk to learn more about Paternoster's amazing history, dating back hundreds of years to when the San and Khoi people were still the main inhabitants.

Classmates also shared some fascinating insights from their professional lives.



But as always, it was not all play and no work; Steven Wimberley spoke about regenerative medicine, followed by Michael Rosenzweig, who presented some of the latest ground-breaking treatment options for human cancer in the USA, in which he is involved.





By die Koelkamers Teater is ons trakteer deur Johan Liebenberg met 'n konsert spesiaal vir ons groep "baby boomers". Die musiek van Neil Diamond, Bruce Springsteen en Pink Floyd moes egter later die onderspit delf toe ons klasmaats die mikrofoon oorgeneem het met "The OP boys are happy.." en ander onvergeetlike OP songs.

>>>13





Hier is enkele van die kommentare wat ná die reünie op ons klas se WhatsApp-groep gedeel is:

Linda Jacobson: *These few days really reframed our whole time at OP for me. I thought I knew the whole class, and I only discovered that I only knew a few of us. I thought the gulf between me and my Afrikaans class mates was political when so much of it was shyness, unfamiliarity and not speaking each other's language. We were so young!...This will always be such a precious memory"*

Santjie Ferreira (née Pieterse): *...wat 'n voorreg en lekker ervaring was dit nie om almal se lewensstories te hoor, die lief en die leed van die lewenspad te deel, lekker pret, lekker lag en mekaar uit 'n meer volwasse oog ervaar as 40 jaar gelede.*

Steven Wimberley: *...I have come away from the reunion with great joy in my heart but also sadness that I didn't spend more time at varsity getting to know all my classmates.*

Deon van Tonder: *I was also reluctant to go ... and it turned out to be way beyond expectations. Let's not wait 10 years.*

Marisa Naude: *..My only regret is that I didn't realise what lovely people were in my class till now. Youth is wasted on the young!! I loved seeing you all...*

Marie Potgieter: *...I am deeply grateful to you all for the positive influence you all had on me growing up ...DANKIE so baie!*

>>>14



Forty Years Later... <<< 13

Daar word reeds onder mekaar bespreek waar ons volgende reünie gaan wees, met voorstelle wat wissel van die Griekse Eilande tot die Drakensberge. Maar dit maak nie eintlik saak waar in die wêreld dit gaan wees nie. Die "Paternoster 30" sal weer daar wees, hopelik saam met nog klasmaats wat nie vanjaar deel kon wees hiervan nie. En soos Deon gesê het: "Let's not wait 10 years." V

Gerhard Giliomee







Editor: *The Vetnews is an excellent vehicle to get your classmates together for reunions. If you are planning a reunion and do not know how to reach everyone, this is where you do it. This article is an excellent example of how to share your unforgettable event with others. It is as simple as organising two or three people to take some good-quality photos of the event or events. Send those (including the names per photo) and a nice article on what was done. The aim is to make Vetnews more about the Vets and less about the clinical topics. There is no better way to break away, have fun and share with like-minded friends. I am sure the spouses will have a couple of stories and similarities to share. We are all married to a strange breed of people: Veterinarians.*



Foot-and-Mouth Disease: Getting the Response Right to Protect Southern Africa's Food Security

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The responsibility of Veterinary Services goes far beyond controlling a disease of livestock. Foot-and-mouth disease (FMD) is one of the most contagious diseases affecting cloven-hoofed animals. That said, in Southern Africa today, FMD is much more than an animal-health problem. It is a **food safety and security problem, a livelihoods problem, a trade problem, and a veterinary governance and management problem**.

When FMD spreads, animals cannot move normally. Farms are placed under restrictions on selling livestock. Abattoirs experience disruptions. Breeding programmes are affected. Milk and meat production are interrupted. Rural households that depend on livestock lose an important source of income and food.

This is confirmed by FAO's warning that the current FMD situation in Southern Africa is threatening livestock production, rural livelihoods, food security and regional trade. It has also stressed that the response must be regional because FMD does not respect national borders. (FAOHome)

This raises an important question for the veterinary profession: **What exactly is the responsibility of Veterinary Services when an FMD outbreak threatens not only animal health, but the food system on which millions of people depend?**

The answer begins with getting the disease-control fundamentals right. As FMD is not a human foodborne disease – but it can threaten food security, the first point needs to be clearly understood.

FMD is **not a conventional foodborne disease of humans**. People do not become infected with FMD by eating properly handled meat or consuming pasteurised milk. This is important because an FMD outbreak should not automatically be translated into a message that the country's meat or milk is unsafe for consumers.

The real food-safety responsibility is different. Veterinary Services must ensure that animals and animal products move through systems in which disease control, hygiene, inspection, traceability and veterinary oversight are maintained.

>>>16

WOAH identifies Veterinary Services as having an important role in food safety through disease surveillance, early detection, prevention and control, as well as oversight of animal identification and traceability. (WOAH)

This leads directly to the bigger issue: **Food safety and food security are not the same thing.**

Food safety is whether food is safe to eat. Food security is whether people have reliable access to sufficient, safe and nutritious food.

FMD can have little direct significance as a human foodborne disease while having a **major impact on food security**. That distinction should be at the centre of how the veterinary profession communicates and manages FMD.

The first line of defence is primordial prevention followed by early detection. If primordial prevention fails and an outbreak occurs, the best-managed FMD outbreak is one detected early. Early detection depends on a chain of people and systems functioning properly.

Farmers must recognise suspicious signs. Veterinarians and animal-health technicians must investigate them. Samples must reach laboratories rapidly. Laboratories must have the capacity to confirm or exclude infection promptly. Results must be communicated quickly in a transparent and honest manner. And, most importantly, veterinary Services must have the authority and resources to act on the information.

WOAH identifies early detection and effective surveillance as fundamental components of FMD prevention and control. Clinical signs alone are not sufficient for definitive diagnosis because FMD can resemble other vesicular diseases; laboratory confirmation is therefore critical. (WOAH)

This is why surveillance is not simply an administrative function of a veterinary department. Surveillance is food-security infrastructure. If an outbreak is detected early, the affected area may be contained more effectively. If it is detected late, animal movements may already have spread the virus to multiple locations.

The consequences then become much larger—as discussed below—because movement restrictions, vaccination, tracing and market disruptions become considerably more complicated.

The **second line of defence** is knowing where animals have been or originated from. Once an outbreak occurs, one question becomes critically important: **Where has the infected animal been, and which animals have been in contact with it?**

That question cannot be answered without traceability. Animal identification and movement records allow Veterinary Services to reconstruct pathways of potential infection.

Animal identification and traceability enable authorities to identify the infected properties; those properties that might be infected or become infected due to contact with infected animals; livestock movements to manage and control possible spread, which markets and auction facilities might be infected; the disinfection of transport vehicles, which abattoirs might be infected and which could be used, potentially exposed herds and geographical areas requiring additional surveillance.

WOAH specifically recognises traceability as an important tool for disease-outbreak management, surveillance, vaccination, zoning, movement control, inspection and certification. (WOAH)

Traceability is therefore sometimes misunderstood as bureaucracy. It is not. Traceability is an epidemiological tool, and its importance becomes even clearer when vaccination is introduced.

Vaccination is an essential management tool, but it is not the whole solution. It has an important role to play in FMD management and control.

South Africa's 2026 response has included a major vaccination programme, with government reporting millions of doses procured and administered and a risk-based approach prioritising areas with high concentrations of susceptible livestock. (Government of South Africa)

But vaccination should never be viewed in isolation. A successful vaccination programme depends on several factors working together: the right vaccine, the right animals, the right areas, the right coverage, the right timing, proper administration, accurate identification, and effective surveillance afterwards.

WOAH notes that vaccination strategies may be mass or targeted depending on the epidemiological situation, and that vaccination campaigns should generally achieve at least 80% coverage in the target population. It also stresses that vaccines must meet appropriate standards and match the circulating virus strains. (WOAH)

This is where vaccination connects directly back to surveillance and traceability: a vaccinated animal should be identifiable, the vaccination should be recorded, the vaccine batch should be traceable, the location should be known, and subsequent disease surveillance must continue.

Vaccination is therefore not an alternative to surveillance and traceability. It depends upon them.

The importance therefore of **Differentiating Infected from Vaccinated Animals (DIVA)** and maintaining trade cannot be overemphasised.

However, for a livestock-exporting region, there is another consideration: How do we demonstrate what is happening epidemiologically in a vaccinated population? The ability to DIVA using appropriate surveillance and diagnostic approaches is an important consideration in disease-control programmes.

This is particularly relevant when countries are working towards maintaining or regaining recognised disease status and market

access. The vaccination policy, diagnostic capacity, animal identification, traceability and trade certification cannot be treated as separate issues. They are different parts of the same disease-control system.

A vaccination programme that is disconnected from primordial prevention and surveillance may reduce disease but leave important questions unanswered. A sophisticated laboratory system that is disconnected from animal identification may produce results that are difficult to interpret epidemiologically. And a traceability system that does not function at farm level cannot provide the assurance required by either Veterinary Services or trading partners. **The system has to work as a continuous singular system.**

The responsibility for **biosecurity** does not start and end with government. Veterinary Services cannot control FMD on their own. Every livestock owner has a role. In fact, every individual up to the consumer level has a role to play. The farm-to-fork principle is of cardinal importance in maintaining a safe and secure food chain.

WOAH recommends practical farm-level measures such as controlling access to livestock, carefully introducing animals into herds, cleaning and disinfecting buildings, vehicles and equipment, monitoring animals and reporting illness. (WOAH)

These measures are sometimes referred to collectively as "biosecurity". But biosecurity is not simply a document hanging on a farm office wall; it is a daily behaviour, managing where animals originate from, who and what have entered the farm, where they are from, whether equipment has been to risk areas, whether newly introduced animals are quarantined, whether sick animals are isolated, the status of the disease surveillance program, and whether suspicious diseases are reported, especially those on the differential diagnosis list for FMD.

These everyday management decisions can determine whether an isolated infection remains isolated—or becomes another outbreak. This is why veterinary education and farmer engagement are as important as regulatory enforcement.

Disease control also does not stop at the farm gate. The abattoir is part of the disease-control system. It is an important part of the veterinary public-health system. Abattoirs with proper veterinary oversight in place provide opportunities to conduct ante- and post-mortem inspections that play an important role in disease surveillance, verification of animal identity and movement records contributing to traceability, appropriate management of any suspect animals and maintaining food safety standards.

WOAH places Veterinary Services at the centre of animal-health and food-safety controls throughout the food-production chain. (WOAH) This becomes particularly important during an FMD outbreak. If livestock cannot move normally, animals remain on farms longer, which can increase feed costs, stocking pressure and financial losses. If abattoirs cannot obtain sufficient animals, processing capacity may be affected, and if processors cannot operate efficiently, downstream food supply can be disrupted.

The impact therefore moves through the food chain.

An FMD outbreak begins with an animal, but its consequences can reach the consumer.

Food security must therefore be part of veterinary thinking and management. Traditionally, veterinary disease control has been measured through indicators such as:

- number of outbreaks;
- number of infected properties;
- animals vaccinated;
- animals tested;
- movements restricted; and
- outbreaks resolved.

These remain important, but FMD forces us to think more broadly, contemplating the impact on One Health, such as what impact controlling FMD might have on the food system. The consequences of very strict FMD control might reduce livestock production, lead to a loss of household income, reduce the availability of livestock products such as meat and milk, increase production costs with a ripple effect on shelf prices, disrupt abattoirs and processors with potential animal and human welfare implications, lead to loss of export income for the country, and create market uncertainty with an increased vulnerability of rural households. FAO has specifically linked the current Southern African FMD situation with threats to food security and rural livelihoods. (FAO Home)

This means that a major responsibility rests on Veterinary Services to consider the food-security consequences of disease-control measures when designing and implementing control strategies. That does **not** mean weakening disease-control measures. It means designing them intelligently, keeping in mind the One Health principles.

>>>18



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A scientifically justified movement restriction may be essential, but the longer animals remain restricted, the greater the potential economic and food-system consequences. The veterinary objective should therefore be to **control disease as rapidly and effectively as possible while creating scientifically justified pathways towards recovery**.

South Africa's new national FMD control measures announced in June 2026 were specifically intended to provide a clearer pathway from detection through management and recovery while protecting trade and limiting unnecessary economic losses. (Government of South Africa)

However, FMD does not stop at South Africa's or Southern Africa's borders. Perhaps the most important lesson from the present Southern African situation is that no country can deal with FMD entirely on its own as livestock move, people move, vehicles move, animal products move, and viruses move with them. FAO has therefore called for stronger cross-border surveillance, laboratory capacity, movement controls, biosecurity and **transparent sharing of epidemiological information**. (FAO Home). This is particularly important in the SADC region, where livestock production systems and wildlife populations frequently extend across national boundaries.

Regional control requires cooperation not only between national Veterinary Services, but also among SADC, the farmers, organised agriculture, laboratories, wildlife authorities, border-control agencies, livestock traders, abattoirs, research institutions, and FAO and the WOAH as international governance bodies. The disease may be national in its legal management, but its epidemiology is regional with potentially international implications.

Apart from animal health and welfare, Veterinary Services must also protect public confidence. There is therefore another responsibility that is easy to overlook: **communication.**

During an outbreak, farmers want reliable information, consumers want to know whether their food is safe, industry wants to understand the implications for markets, trading partners want credible disease information, and veterinarians need to know what rules apply. Conflicting or poorly explained messages can create confusion and, ultimately, reduce compliance. The veterinary profession therefore has a responsibility to communicate clearly about what FMD is—and what it is not.

Most importantly, **FMD should not be confused with a human foodborne disease.** It is therefore imperative that the food-safety message remain scientifically accurate. At the same time, the food-security consequences must not be underestimated. These two messages are entirely compatible.

The current FMD crisis provides an opportunity to reconsider what society expects from veterinarians. The modern veterinarian is not simply the professional who is managing animal health and welfare. Veterinarians are also disease detectives, public-health professionals, food-chain professionals, risk managers, advisers to farmers and the rest of the food chain stakeholders, contributors to policy, communicators, and participants in national, regional and international food-security systems.

The same veterinarian who identifies FMD on a farm may therefore contribute to protecting the food supply and livelihoods of thousands of people.

That is a considerable professional responsibility.

Getting FMD right means getting the **whole chain** right. Early detection allows rapid response; rapid response limits spread, traceability identifies potential contacts, movement control interrupts transmission, vaccination builds population immunity where appropriate, surveillance tells us whether the disease is still circulating, biosecurity prevents further introduction and spread, laboratory capacity provides the evidence on which decisions are based, veterinary oversight protects the integrity of the food chain, regional cooperation reduces the risk of reintroduction, and clear communication maintains confidence in the system. Each component relies on and supports the next. Remove one, and the effectiveness of the others may be compromised.

The present FMD situation should not be viewed solely as a challenge for government Veterinary Services. It is a challenge for the entire veterinary profession. State veterinarians, private practitioners, animal-health technicians, veterinary laboratories, academic institutions, organised veterinary associations and veterinary regulators all have roles to play.

Perhaps the greatest lesson from the current crisis is that FMD control should no longer be viewed through a narrow animal-health lens. The real objective is much broader. Veterinary services are protecting livestock, farmers, rural livelihoods, food production, consumer confidence, markets, and, ultimately, **food security**.

Veterinary Services therefore occupy a unique position. They have the scientific expertise to understand the disease, the field presence to detect it, the regulatory mandate to control it, and the professional responsibility to protect the integrity of the food chain. That responsibility must be exercised with science, transparency and consistency.

The bottom line is, FMD is not a human foodborne disease, but **an uncontrolled FMD epidemic can become a food-security crisis**. That distinction should shape the way Southern Africa responds.

The answer is not simply more vaccination, nor is it simply more movement control, nor better laboratory testing; the answer lies in integrating all of these elements into a coherent veterinary disease-control system.

As WOAH emphasises, effective FMD control depends on early detection, surveillance, appropriate vaccination, biosecurity, movement control and traceability. (WOAH) and as the current Southern African experience demonstrates, these systems must operate across borders as well as within them. (FAOHome)

Ultimately, getting FMD management and control right is not only about controlling a virus in animals. **It is about protecting Southern Africa's ability to produce safe food, sustain rural livelihoods and maintain a resilient food supply for the future.** V

Enucleations performed by the ophthalmology service have lower complication rates when compared to enucleations performed by the emergency service

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Objective

To compare patient characteristics, surgical techniques, and outcomes of enucleations performed by emergency service (ES) versus ophthalmology service (OPH) clinicians at a veterinary teaching hospital.

Methods

Medical records over 5 years were reviewed for signalment, indication, surgeon affiliation, surgical technique, perioperative management, and complications.

Results

Records from 576 dogs and cats (468 OPH cases and 118 ES cases) were identified for review. Emergency service enucleations were more often performed after hours (16.1% vs 1.3%) and on weekends (37.3% vs 3.3%) and were primarily performed by rotating interns and ES residents, whereas OPH cases were typically performed on weekdays by ophthalmology residents or speciality interns or faculty. Common ES indications were proptosis (24.6%) and perforated corneal ulcers (39.0%), whereas OPH cases most often involved glaucoma (21.4%), uveitis (18.8%), or neoplasia (11.6%). Cases from ES were significantly less likely to receive preoperative bloodwork, intraoperative antibiotics, or local anaesthetic blocks. Intraoperative haemorrhage occurred in 14.4% of ES versus 0.4% of OPH cases. Postoperative complications, including dehiscence (6.8%), infection (6.8%), and draining tracts (2.5%), were also significantly more frequent in ES cases (16.9% vs 0.7%). Financial limitations were commonly cited as the reason for ES enucleations.

Conclusions

Patient and procedure characteristics differed between ES and OPH cases. Dogs and cats enucleated by ES experienced significantly more intraoperative and postoperative complications.

Clinical Relevance

Findings support the need to train ES clinicians to perform enucleations. Specific training focusing on circumstances surrounding ES cases can potentially mitigate complications and improve outcomes.

Enucleation is a common surgical procedure performed in veterinary medicine. In addition to situations in which the eye cannot be salvaged, or pain cannot be relieved by other means, enucleations may be elected instead of other globe-preserving therapies when financial resources are limited or compliance with treatment is unlikely due to owner- or pet-related challenges.[1] Some of the most common indications for enucleation include trauma, perforated corneal ulcers, suspected intraocular neoplasia, and glaucoma.[2]

Enucleations can be performed by veterinarians with many different types of training, but in a university setting they are often performed by a specialist ophthalmology service (OPH). Complications of enucleation may include haemorrhage, infection, surgical site dehiscence, draining tract formation, orbital emphysema, and contralateral vision loss.[3] Because not all emergency service (ES) clinicians receive specific training in enucleation techniques and because they do not perform the procedure as frequently as specialist ophthalmologists, we theorised that the complication rate may be higher for enucleations performed in an ES setting.

However, information on comparative outcomes for enucleations performed in an ES setting versus those performed by OPH has not been published. Furthermore, OPH may be more likely to perform enucleations for chronic or progressive disease, whereas ES staff may be more likely to remove eyes due to trauma or acute disease due to the nature of their clientele and work. However, these potential differences have never been investigated.

As such, the primary objective of this study was to compare the prevalence and types of indications and complications associated with enucleations performed by the OPH or ES. Secondary objectives were to compare differences in surgical technique and perioperative management for enucleations performed by the OPH or by ES. This information could improve clinical decision-making and prompt changes in training for ES clinicians.

>>>20

Methods

The medical records of the Foster Hospital for Small Animals at the Cummings School of Veterinary Medicine at Tufts University were retrospectively reviewed from July 1, 2020, through July 1, 2025, to identify dogs and cats that underwent enucleation by the OPH or ES. Data were initially extracted separately for dogs and cats. Because initial analysis showed no significant differences based on species, all statistical analyses were performed on the combined population.

Data were extracted from the hospital's electronic medical record system using a standardised data collection form. A single reviewer (SHB) performed initial data abstraction, which was then audited by a second reviewer (SP) to ensure consistency and completeness. Discrepancies were resolved by consensus.

Data collected from the medical records for each case included patient signalment, surgical indication, surgeon affiliation (ES or OPH), and surgeon position (faculty, resident [ophthalmology speciality interns were included in the resident category], rotating intern, or student). Details of the surgical procedure were recorded, including the eye affected (right, left, or bilateral), whether enucleations were performed concurrently or at different times (if bilateral), and the surgical technique used (subconjunctival, transpalpebral, or not reported). Additional procedural variables included orbital implant placement, choice of suture material, and administration of a local anaesthetic block. Performance of laboratory testing before surgery, administration of intraoperative or postoperative antibiotics, and the presence or absence of a completed anaesthesia and/or surgical report in the medical record were also noted. The timing of each surgery was classified according to both time of day and day of the week. Surgeries starting between 7:00 am and 5:00 pm were considered to have been performed during working hours, whereas surgeries beginning after 5:00 pm were considered to have been performed after hours. Weekday procedures were defined as those performed Monday through Friday; surgeries performed on Saturdays, Sundays, or holidays were categorised as weekend cases.

Intraoperative, anaesthetic, and postoperative complications were recorded when documented in the medical record. Intraoperative complications were categorised as haemorrhage, difficulty closing, or other. Anaesthetic complications included bradycardia, hypotension, hypertension, movement or waking during anaesthesia, prolonged recovery, painful or dysphoric recovery, or other. Postoperative complications were defined as any adverse events documented within 30 days of surgery and were classified as dehiscence, infection, suture reaction, draining tract, haemorrhage, or other. Several complications previously reported in relation to enucleation, such as orbital emphysema and contralateral vision loss, were not identified in our patient population.[4] Surgical site infection was diagnosed if a positive bacterial culture was obtained or if devitalized or abnormal tissue or purulent exudate was present. Suture reaction was diagnosed if no growth was noted on bacterial culture and inflammation was limited to the suture line. Management of postoperative complications was recorded and categorised as medical treatment, surgical intervention, or euthanasia. For patients requiring surgical revision, intraoperative findings were documented, including identification of retained adnexal structures (conjunctiva, nictitans, or lid margin) or other abnormalities.

Records were reviewed for notations regarding the decision to perform an ES enucleation, such as financial constraints, lack of specialist availability, or urgency due to pain, pet behaviour, or medical status.

Statistical analysis

The prevalence of ES versus OPH enucleations was calculated out of the entire hospital caseload during the study period. The specific indications and complications were compared between the 2 groups using descriptive statistics. Descriptive statistics were used to summarise patient demographics, surgical characteristics, indications for surgery, and complication rates. Complication rates were additionally compared using descriptive statistics between subconjunctival and transpalpebral enucleation techniques within each service among cases in which surgical approach was documented. Univariable analysis was conducted to determine the percentage in each category. A contingency table with the Fisher exact test was used to test categorical variables. Multivariable analysis was performed to identify potential confounding variables with respect to complications. Variables were selected for the multivariable analysis if they were significantly different between OPH and ES in the initial analysis. Multivariable analysis was performed using a linear model followed by the Tukey honestly significant difference (HSD) test. All analyses were performed using commercial statistical software (SYSTAT, version 13.2; Grafiti), with a significance threshold set at $P \leq .05$.

Results

A review of electronic medical records from 2020 through 2025 identified 576 canine and feline enucleations (458 OPH and 118 ES cases). Of the total cases, there were 364 OPH dog cases, 94 ES dog cases, 104 OPH cat cases, and 14 ES cat cases. A summary of the age, sex, and breeds within each category is summarised in **Table 1**.

Surgical variables are summarised in **Table 2**. The side of the enucleated eye (right vs left) did not differ significantly between the OPH and the ES groups, with 53.1% versus 52.5% right eye enucleation, respectively. However, bilateral enucleation at the same time was more frequently performed by ES (6 of 118 [5.1%]) compared to OPH (4 of 458 [0.9%]; $P = .0067$). Staggered bilateral procedures (enucleating each eye at different times) occurred exclusively in OPH cases (36 of 458 [7.9%]; $P = .0004$).

The distribution of surgeon affiliation differed significantly between the OPH and ES groups. In the OPH group, the majority of enucleations were performed by ophthalmology residents or speciality interns (270 of 458 [59.0%]), followed by faculty members (187 of 458 [40.8%]). Only a single enucleation (0.2%) was performed by a veterinary student, and no enucleations were performed by general rotating interns. In contrast, the ES group displayed more diversity regarding surgeon experience.

The highest proportion of ES-performed enucleations were conducted by ES residents or by rotating interns (48 of 110 [40.7%] and 47 of 110 [39.8%], respectively), with a smaller proportion performed by veterinary students or faculty members (7 of 110 [5.9%] and 8 of 110 [6.8%], respectively). The differences in surgeon distribution between services were statistically significant for all categories ($P < .001$; Table 2).

Surgeries conducted by ES were significantly more likely to occur on weekends (44 of 118 [37.3%] vs 15 of 458 [3.3%], respectively; $P < .0001$) and outside regular working hours (19 of 118 [16.1%] vs 6 of 458 [1.3%], respectively; $P < .0001$). Cases from ES were significantly less likely to have had preoperative bloodwork performed (102 of 118 [86.4%] vs 445 of 458 [97.2%], respectively; $P < .0001$) and were administered perioperative antibiotics less frequently than OPH cases (49 of 118 [41.5%] vs 423 of 458 [92.4%], respectively; $P < .0001$). Postoperative antibiotics were given more frequently in ES cases than OPH cases (97 of 118 [82.2%] vs 316 of 458 [69.0%], respectively; $P < .0041$), whereas local anaesthetics were administered more frequently in OPH cases (170 of 458 [37.1%] vs 12 of 118 [10.2%], respectively; $P < .0001$; Table 2).

Anaesthesia and surgery reports differed significantly between groups. Anaesthesia reports were completed in 445 of 458 OPH cases (97.2%), but only 64 of 118 ES cases (54.2%), and surgery reports were similarly more common in OPH (97.8% vs 51.7%; $P < .0001$ for both). The surgical technique was noted in the records of 99.3% of OPH procedures and 52.0% of ES procedures. Among cases in which the surgical technique was recorded, the subconjunctival approach was used more often than the transpalpebral approach in both OPH and ES procedures (387 of 455 [85.0%] vs 68 of 455 [15.0%] for OPH procedures and 46 of 61 [75.4%] vs 15 of 61 [24.6%] for ES procedures), though the proportion was not significantly different between the 2 groups. Surgical technique was less likely to be reported in the medical records of the ES group ($P < .0001$).

Suture material differed significantly between groups as well; OPH procedures most commonly used polyglactin 910 (378 of 454 [83.3%]), whereas ES cases more commonly used poliglecaprone 25 (30 of 65 [46.2%]), polydioxanone (28 of 65 [43.1%]), and other materials ($P < .0001$ for all comparisons). Histopathology was submitted more frequently in OPH cases compared to ES (267 of 458 [58.3%] vs 21 of 118 [17.8%]; $P < .0001$), and prosthetic implants were used exclusively in OPH cases (Table 2).

The primary indications for enucleation differed significantly between OPH and ES cases as summarised in **Table 3**. Overall, perforated corneal ulcers and proptosis were the most common indications among ES cases, accounting for 46 of 118 (39%) and 29 of 118 (24.6%) of all ES enucleations, respectively, compared to only 71 of 458 (15.5%) and 14 of 458 (3.1%) of OPH enucleations, respectively ($P < .0001$). Penetrating trauma was also slightly more common among ES patients when compared to OPH (8 of 118 [6.8%] vs 10 of 458 [2.2%]; $P < .0171$). In contrast, the most common indications for enucleation in the OPH included primary glaucoma (98 of 458 [21.4%]), uveitis with or without glaucoma (86 of 458 [18.8%]), and neoplasia (53 of 458 [11.6%]). All 3 of these indications were significantly more frequent in the OPH group when compared to the ES group ($P < .001$ for all comparisons). Other indications, including lens luxation, hyphema, nonperforated corneal ulcer, orbital abscess, and orbital tumour, did not differ significantly in frequency between the 2 groups.

Table 1—Demographic characteristics of dogs and cats undergoing enucleation by ophthalmology service (OPH) or emergency service (ES).

	Dog OPH (n = 364) vs ES enucleations (n = 94)		Cat OPH (n = 104) vs ES enucleations (n = 14)	
Age (y); median (range) Sex	9.12 (0.01, 17.05)	9.34 (0.02, 18.02)	9.34 (0.01, 17.03)	5.91 (0.06, 16.01)
FI	13 (3.6%)	12 (11.5%)	3 (3.2%)	2 (14.3%)
FS	170 (46.7%)	41 (39.4%)	45 (47.9%)	5 (35.7%)
MI	16 (4.4%)	13 (12.5%)	5 (5.3%)	1 (7.1%)
MN	165 (45.3%)	38 (36.5%)	41 (43.6%)	6 (42.9%)
Breed	Mixed (137 [37.6%])	Mixed (27 [26.0%])	Domestic shorthair (51 [54.3%])	Domestic shorthair (13 [92.9%])
	Shih Tzu (30 [8.2%])	Shih Tzu (22 [21.2%])	Domestic longhair (12 [12.8%])	Domestic longhair (1 [7.1%])
	Boston Terrier (29 [8.0%])	Pug (7 [6.7%])	Domestic medium hair (6 [6.4%])	

FI = Female intact. FS = Female spayed. MI = Male intact. MN = Male neutered.

>>>22





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Table 2—Comparison of surgical variables for enucleations performed by OPH versus ES.

	OPH Enucleations (n = 458)	ES Enucleation (n = 118)	P value
Surgeon		110	
Faculty	187 (40.8%)	8 (6.8%)	< .0001*
Resident/specialty intern	270 (59.0%)	48 (40.7%)	.0004*
Intern		47 (39.8%)	< .0001*
Student	1 (0.2%)	7 (5.9%)	< .0001*
Time of week			< .0001*
Weekday	443 (96.7%)	74 (62.7%)	
Weekend	15 (3.3%)	44 (37.3%)	
Time of day			< .0001*
Working hours	452 (98.7%)	98 (83.1%)	
After hours	6 (1.3%)	19 (16.1%)	
Bloodwork performed	445 (97.2%)	102 (86.4%)	< .0001*
Intraoperative antibiotics given	423 (92.4%)	49 (41.5%)	< .0001*
Postoperative antibiotics given	316 (69.0%)	97 (82.2%)	.0041*
Local block used	170 (37.1%)	12 (10.2%)	< .0001*
Surgical technique	455	61	
Subconjunctival	387 (85.1%)	46 (75.4%)	.0634
Transpalpebral	68 (15.0%)	15 (24.6%)	.0634
Suture material	454	65	
Glycomer 631	60 (13.2%)	0 (0.0%)	.0003*
Poliglecaprone 25	10 (2.2%)	30 (4.62%)	< .0001*
Polyamide	1 (0.2%)	3 (4.6%)	.0069*
Polydioxanone	5 (1.1%)	28 (43.1%)	< .0001
Polyglactin 910	378 (83.3%)	4 (6.2%)	< .0001
Prosthetic placed	19 (4.1%)	0 (0.0%)	.0188
Histopathology submitted	267 (58.3%)	21 (17.8%)	< .0001
Reports completed			< .0001
Anesthesia report	445 (97.2%)	65 (54.2%)	
Surgery report	448 (97.8%)	61 (51.7%)	

*Statistically significant ($P < .05$).

>>>23

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Table 3—Primary and secondary indications for enucleation in dogs and cats by OPH versus ES.

	OPH Enucleations (n = 458)	ES Enucleation (n = 118)	P value
Blunt trauma	14 (3.1%)	7 (5.9%)	.1649
Penetrating trauma	10 (2.2%)	8 (6.8%)	.0171*
Proptosis	14 (3.1%)	29 (24.6%)	< .0001*
Corneal ulcer—not perforated	10 (2.2%)	3 (2.5%)	.7352
Corneal ulcer—perforated	71 (15.5%)	46 (39.0%)	< .0001*
Glaucoma—primary	98 (21.4%)	5 (4.2%)	< .0001*
Neoplasia (confirmed or suspected)	53 (11.6%)	2 (1.7%)	.0004*
Uveitis (± glaucoma)	86 (18.8%)	5 (4.2%)	< .0001*
Lens luxation (± glaucoma)	42 (9.2%)	7 (5.9%)	.3542
Hyphema (± glaucoma)	26 (5.7%)	3 (2.5%)	.2366
Orbital infection/retrobulbar abscess	5 (1.1%)	0 (0.0%)	.5888
Orbital tumor	1 (0.2%)	0 (0.0%)	1.0000
Other	28 (6.1%)	3 (2.5%)	.1690
Additional indications for performing surgery in the ES OPH unavailable	N/A	4 (3.4%)	N/A
Urgent due to pain	N/A	5 (4.2%)	N/A
Urgent due to pet behaviour	N/A	1 (0.8%)	N/A
Urgent due to medical status	N/A	2 (1.7%)	N/A
Financial	N/A	43 (36.4%)	N/A
Other	N/A	2 (1.7%)	N/A

N/A = Data is not available as this section pertains to ES enucleations only.

*Statistically significant ($P < .05$).

For ES cases, secondary indications were often reported to reflect logistical and nonmedical considerations. These included financial constraints (43 of 118 [36.4%]), urgent need due to pain (5 of 118 [4.2%]), lack of OPH availability (4 of 118 [3.4%]), as well as urgency related to pet behavior resulting in inability to medically manage the condition and medicate the pet at home as required (1 of 118 [0.8%]); underlying medical status (2 of 118 [1.7%], both cases had uncontrolled diabetes melitus); or other causes including owner request not to delay the enucleation procedure (due to various considerations), and thus requesting it would be promptly performed by the ES (2 of 118 [1.7%]). These secondary indications were not documented in any OPH cases (Table 3).

Overall complication rates were significantly higher in ES enucleations compared to OPH (20 of 118 [16.9%] vs 3 of 458 [0.7%], respectively; $P < .0001$). Excessive intraoperative haemorrhage was the most common complication in ES cases and occurred significantly more often than in OPH cases (17 of 118 [14.4%] vs 2 of 458 [0.4%]; $P < .0001$). Other intraoperative complications were rare, including a single report of each of the following: inadvertent penetration of the globe during local block performed by surgeon in ES procedure and surgeon reported difficulty in identifying tissue layers in OPH procedure **(Table 4)**. Anaesthetic complications occurred in both groups at low frequencies, with no statistically significant difference between the groups. The most commonly reported anaesthetic issue was a difficult or dysphoric recovery, noted in 20 of 458 (4.4%) OPH and 6 of 118 (5.1%) ES cases. Other anaesthetic complications, including bradycardia, hypotension, hypertension, movement during anaesthesia, and prolonged recovery, occurred sporadically and did not differ significantly between groups.

Postoperative complications were significantly more common in ES cases than in OPH cases (20 of 118 [16.9%] vs 3 of 458 [0.7%], respectively; $P < .0001$). In ES cases, the most frequent complications were dehiscence (8 of 118 [6.8%]), infection (8 of 118 [6.8%]), and draining tract formation (3 of 118 [2.5%]), all of which occurred significantly more often than in OPH cases ($P < .0001$ for dehiscence and infection; $P < .0084$ for draining tract). Cases in ES were more likely to require intervention for postoperative complications. Medical management was elected in 4 of 118 ES cases (3.4%) versus 1 of 458 OPH cases (0.2%; $P < .0071$), and surgical revision was required in 9 of 118 ES cases (7.6%) compared to 2 of 458 OPH cases (0.4%; $P < .0001$). No patients in either group were euthanised due to complications. Among the complications requiring surgical intervention, the following were significantly more common among ES cases when compared to OPH cases: retained conjunctiva (4 of 118 [3.4%] vs 2 of 458 [0.4%], respectively; $P < .0179$), retained lid margin (3 of 118 [2.5%] vs 0 of 458 [0.0%], respectively; $P < .0084$), and other findings (4 of 118 [3.4%] vs 1 of 458 [0.2%], respectively; $P < .0071$). The other ES cases included infection (3 of 118 [2.5%]) and dehiscence due to poor surgical technique (1 of 118 [0.8%]), and for OPH they included infection (1 of 458 [0.2%]; Table 4).

>>>24

Table 4—Intraoperative, anaesthetic, and postoperative complications associated with enucleation performed by OPH versus ES.

	OPH enucleations (n = 458)	ES enucleations (n = 118)	P value
Intraoperative complications			
Hemorrhage	2 (0.4%)	17 (14.4%)	< .0001*
Difficulty closing	0 (0.0%)	1 (0.8%)	.2049
Other	1 (0.2%)	1 (0.8%)	.3680
Anaesthetic complications Bradycardia	4 (0.9%)	2 (1.7%)	.6077
Hypotension	3 (0.7%)	3 (2.5%)	.1039
Hypertension	1 (0.2%)	0 (0.0%)	1.0000
Moved/woke up	2 (0.4%)	2 (1.7%)	.1878
Prolonged recovery	2 (0.4%)	1 (0.8%)	.4980
Difficulty/painful/dysphoric recovery	20 (4.4%)	6 (5.1%)	.8032
Other	3 (0.7%)	2 (1.7%)	.2724
Postoperative complications Total complications	3 (0.7%)	20 (16.9%)	< .0001*
Dehiscence	2 (0.4%)	8 (6.8%)	< .0001*
Infection	1 (0.2%)	8 (6.8%)	< .0001*
Draining tract	0 (0.0%)	3 (2.5%)	.0084*
Hemorrhage	0 (0.0%)	1 (0.8%)	.2049
Management of complications: Medical management	1 (0.2%)	4 (3.4%)	.0071*
Surgical management	2 (0.4%)	9 (7.6%)	< .0001*
Surgical findings for surgically managed complications: Retained conjunctiva	2 (0.4%)	4 (3.4%)	.0179*
Retained nictitans	1 (0.2%)	0 (0.0%)	1.0000
Retained lid margin	0 (0.0%)	3 (2.5%)	.0084*
Other	1 (0.2%)	4 (3.4%)	.0071*

*Statistically significant ($P < .05$).

Table 5—Complications by surgical technique within OPH and ES.

	Subconjunctival (n)	Transpalpebral (n)	P value
OPH complications	387	68	
Intraoperative	2 (0.5%)	1 (1.5%)	.3850
Anesthetic	29 (7.5%)	4 (5.9%)	.8020
Postoperative	2 (0.5%)	4 (5.9%)	.110
ES complications	46	15	
Intraoperative	8 (17.4%)	6 (40.0%)	.0870
Anesthetic	8 (17.4%)	2 (13.3%)	1.0000
Postoperative	4 (8.7%)	4 (26.7%)	.0930

Among cases in which surgical technique was documented, complication rates did not differ significantly between subconjunctival and transpalpebral enucleations within either service **(Table 5)**.

Multivariable analysis was performed to assess the association between surgical indications, antimicrobial use (intra- and postoperatively), surgeon classification, and surgical technique to intraoperative and postoperative complications. Overall, intraoperative complication rates were significantly affected by the surgical technique and surgical indication ($P = .002$ and $P = .018$, respectively), and postoperative complication rates were significantly affected by the surgical technique and surgeon classification ($P = .005$ and $P = .006$, respectively).

Specifically, the transpalpebral approach was significantly associated with higher complication rates regardless of the service performing the enucleation ($P = .002$ for intraoperative complications; $P = .005$ for postoperative complications).

Using the Tukey HSD test to further assess the association between surgical indications and intraoperative complications, proptosis was associated with a higher intraoperative complication rate when compared to perforated corneal ulcers (P = .02), but significance was not reached on all other comparisons. When using the Tukey HSD test to further evaluate the association between surgeon classification and postoperative complications, enucleations performed by residents had more postoperative complications when compared to enucleations performed by interns (P = .028).

Discussion

This retrospective study evaluated differences in indications, surgical technique, peri- and postoperative management, and complication rates between enucleations performed by the OPH and those performed by ES clinicians at a single veterinary teaching hospital. Although enucleation is a common procedure in veterinary medicine, our findings reveal substantial differences in patient population, surgical protocols, and outcomes between services, with important clinical implications.

Enucleations performed by ES were significantly more likely to occur after hours or on weekends, reflecting their emergent nature and the urgency of ocular presentations, such as proptosis and perforated corneal ulcers. These findings are consistent with previous literature characterising these presentations as true ophthalmic emergencies.[2] The emergent nature of ES cases may reduce the opportunity for preoperative planning, such as laboratory testing, client counselling, or specialist consultation, and may potentially increase the risk for surgical complications.

Emergency service procedures were often performed by rotating interns and residents, and documentation does not indicate the extent of direct faculty involvement. In contrast, OPH cases were primarily performed by speciality interns, ophthalmology residents, or faculty, all of whom had received structured surgical training. Ophthalmology house officers are typically required to perform multiple supervised enucleations before operating independently, which likely contributes to standardised technique and improved outcomes.[5,6] However, when multivariable analysis was performed, resident-performed enucleations were associated with higher rates of postoperative complications when compared to interns. This unexpected finding can be potentially explained by case selection; it is possible that more challenging cases (which are potentially more prone to complications) were purposely performed by more trained individuals. It is also important to note that while many enucleations were performed by residents in both OPH and ES, no OPH enucleations were performed by interns, making the significance of this finding unclear.

Documentation of surgical technique differed substantially between services, with nearly all OPH cases reporting the technique used (99.3%) compared with only half of ES cases (52.0%). This discrepancy likely reflects differences in workflow and documentation practices, particularly given the high proportion of ES procedures performed after hours. Among cases in which the surgical technique was recorded, both services predominantly used the subconjunctival approach, and the relative proportions of subconjunctival versus transpalpebral techniques did not differ significantly between groups. However, the markedly higher rate of unreported technique in ES cases limits the strength of direct comparisons and highlights an opportunity for improved documentation within the ES.

Intraoperative complications were significantly more prevalent in ES enucleations when compared to OPH enucleations. These cases differed significantly in the common indications and the type and level of training of the surgeon, which may both contribute to this finding. While minimal haemorrhage has been reported for enucleations performed by experienced surgeons, those without experience may encounter greater blood loss and variability in outcomes.[1] Our results support this assertion, with ES cases also showing higher rates of postoperative complications, including dehiscence, infection, and draining tract, and a significantly greater need for surgical revision. These complications are commonly reported in the literature as consequences of retained secretory tissue, poor closure technique, or incomplete hemostasis.[3,7] While these complications may be associated with skill and experience level, the multivariable analysis performed did not reveal such a connection as previously discussed. When assessing a potential correlation between specific indications and complication rates in a multivariable analysis, the only significant finding was a higher intraoperative complication rate with enucleations performed secondary to proptosis. This can potentially be explained by the significant trauma associated with proptosis, which can make tissue layer identification and dissection more challenging and result in more intraoperative complications.

When assessing the association between surgical technique and complications across both services, the transpalpebral approach was significantly associated with higher complication rates regardless of the service performing the enucleation (P = .002 for intraoperative complications; P = .005 for postoperative complications). This finding correlates with literature reports[1,8] of more blood loss associated with transpalpebral enucleations, but further research is potentially warranted to compare the 2 methods for other complications beyond haemorrhage. Nonetheless, we did not identify statistically significant differences in complication rates between subconjunctival and transpalpebral techniques within each service. While ES transpalpebral cases demonstrated numerically higher intraoperative and postoperative complication rates, small sample size likely limited statistical power, especially given the lack of documentation of technique for ES cases. These findings suggest that surgical technique alone does not explain the higher overall complication rate observed in ES cases.

Postoperative surgical site infection rates in the ES group in this study were comparable to or higher than those reported in recent studies. Dacanay et al.[7] found a surgical site infection rate of 5%, whereas other reports[3] suggest rates ranging from 2% to 3% in clean or clean-contaminated surgeries. Notably, both studies emphasised that prolonged or inappropriate postoperative antibiotic therapy may increase rather than decrease the risk of infections. Our findings similarly revealed greater postoperative antibiotic use in ES cases, which could reflect either clinician concern for contamination or a reaction to emerging complications.

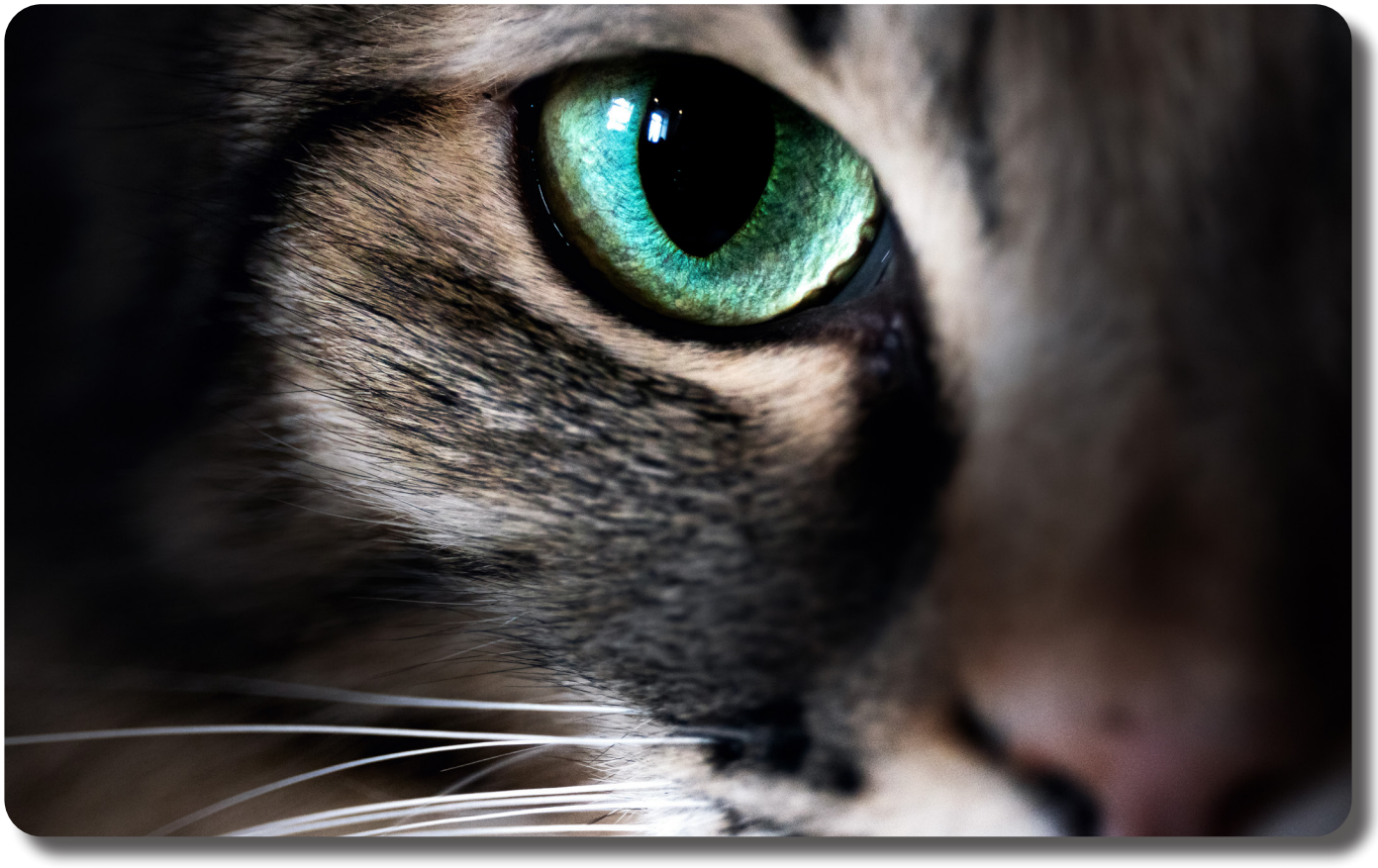
Beyond surgical and technical factors, our study revealed that over one-third of ES cases were influenced by financial constraints, and others were expedited due to lack of specialist availability, patient pain, or behavioural issues. These findings are consistent with the literature on client decision-making in veterinary emergency medicine, which highlights cost, access, and urgency as major drivers of care.[9–11] While ES clinicians must often act quickly and with limited resources, our results suggest that these cases may benefit from improved procedural protocols and support systems to mitigate risk.

Several limitations must be acknowledged. As a retrospective study, our analysis relied on available documentation, which was more frequently incomplete in ES cases, particularly with regard to anaesthesia and surgical reports. We also grouped cases by service affiliation, which may not perfectly capture individual surgeon experience or case complexity. Additionally, the study was conducted at a single academic institution and may not reflect practices or outcomes in general practice or private practice speciality settings.

Nonetheless, the results of this study underscore the need for enhanced standardisation of enucleation protocols, especially when performed in emergency settings. Clinicians from the ES may benefit from additional training in ophthalmic surgery and access to structured supervision for complex procedures. When clinically feasible, referral to a speciality service may offer better outcomes, particularly in nonurgent cases where ongoing care for the contralateral eye may be warranted. V

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First report of traumatic myiasis in the wild Komodo dragon (*Varanus komodoensis* Ouwens, 1912) from Indonesia

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Abstract

Myiasis, the infestation of living vertebrate tissue by dipteran larvae, is commonly reported in humans and domestic animals but rarely documented in wild reptiles. Information on its occurrence in the endangered Komodo dragon (*Varanus komodoensis* Ouwens, 1912) is lacking, despite the species' conservation importance. In April 2025, during routine population monitoring in Komodo National Park, an adult male Komodo dragon was captured with a shoulder wound infested by fly larvae. The animal was in good physical condition, and the wound was cleaned and treated before release. A subset of larvae was reared to the third instar for morphological identification.

The larvae were exclusively identified as *Chrysomya rufifacies* (Macquart, 1842; Diptera: Calliphoridae), with their developmental stage indicating an approximate post-infestation interval of 2–3 days. Concurrent environmental sampling using baited traps yielded 48 adult flies trapped from the surrounding habitat, including 54% *Chrysomya rufifacies*, 35% *Chrysomya megacephala* (Fabricius, 1794; Diptera: Calliphoridae), and 10% *Sarcophaga* sp. (Diptera: Sarcophagidae). This suggests a diversity of potential, opportunistic myiasis agents within the dragon's range. To our knowledge, this is the first documented case of traumatic myiasis in a wild Komodo dragon. This finding underscores the need for a multidisciplinary approach to the management of wild Komodo dragon populations, integrating veterinary medicine and conservation biology to mitigate potential health risks under the One Health framework.

Introduction

Myiasis is the infestation of living vertebrate tissues by dipteran larvae (Francesconia and Lupi 2012; Solomon et al. 2016). This condition may lead to a range of clinical outcomes, depending on the location and type of tissue affected. Myiasis cases are commonly classified according to the affected body part, including the cutaneous (skin), gastrointestinal, ocular, genital, and other systems (Francesconia and Lupi 2012).

Cutaneous myiasis can be further divided into three distinct clinical forms: furuncular myiasis, cutaneous larval migrans, and wound or traumatic myiasis (Zumpt 1965). The present report focuses on traumatic myiasis, a condition where facultative or obligate larvae—predominantly from the families Calliphoridae and Sarcophagidae—invade and enlarge pre-existing wounds or colonise soft tissues (Zumpt 1965; Hall et al. 2016).

Cases of myiasis are frequently reported in humans and domestic animals (Hall and Wall 1995). However, reports from wild reptiles are scarce, despite the fact that their occurrence has been reported in tropical regions (Baumgartner 1993; Dehghani et al. 2012; Alvaro et al. 2025). In wildlife cases, myiasis has significant ecological implications, as larval infestations may cause tissue destruction, secondary infections, and systemic illness that potentially reduce survival (Farkas and Hall 1998). Documentation of such cases is particularly valuable in vulnerable species such as the Komodo dragon (*Varanus komodoensis* Ouwens, 1912), the world's largest living lizard, which occurs only on a few islands in eastern Indonesia.

Komodo dragons are vulnerable due to their limited range and face multiple conservation threats such as habitat loss, human disturbance, and climate change (Jessop et al. 2021). Parasitic infections can exacerbate these problems. While comprehensive literature reviews on reptile parasites have been conducted in regions like Iran (Sazmand et al. 2024), documented cases of myiasis in Southeast Asian reptiles, particularly in flagship species like the Komodo dragon, remain extremely scarce. Yet little is known about the occurrence of myiasis in this species, its impact, or the types of flies involved. To our knowledge, no cases have been formally documented in the wild. Here, we describe the first reported case of traumatic myiasis in the Komodo dragon at Komodo National Park, Indonesia.

Case presentation

This study was conducted as part of the 2025 Komodo Dragon Population Monitoring Program carried out by the Komodo National Park Authority and the Komodo Survival Program in Komodo National Park, Manggarai Barat Regency, East Nusa Tenggara, Indonesia. Several traps baited with goat meat (Purwandana et al. 2014) were used to capture the dragons during the monitoring program. On April 25, 2025, an adult male dragon was encountered at Loh Buaya, Rinca Island. We measured its body size and examined its physical condition (estimated age: 13 years (based on individual record); 140 cm snout–vent length (SVL); body weight: 53.9 kg). During the time of capture in April 2025, the local weather in the semi-arid environment of Loh Buaya was transitioning at the end of the rainy season, characterised by occasional light rain.

The dragon was observed to be in good physical health as it responded to bait and approached the capture site. We observed a wound on its left shoulder which was infested with fly larvae (Fig. 1).

>>>28



Figure 1: Traumatic myiasis on the shoulder of a Komodo dragon

A thorough clinical examination was not possible due to the limited duration of handling procedures within the monitoring program and the limited availability of personnel. The wound was then treated with 70% ethanol and rivanol. No further medical intervention was possible owing to the absence of the necessary equipment and facilities in the field. The discovery of this unexpected finding precluded any prior preparation. Consequently, the dragon was released, as transporting it to a treatment facility was not possible. Subsequent observations were not conducted because of the low probability of recapturing the dragon.

Larvae were manually collected from the wound using forceps. Out of an estimated total of 2,000 larvae, approximately 100 were kept alive for rearing on a goat meat substrate inside a perforated plastic box to provide adequate ventilation until they reached the third-instar stage, while the remainder were immediately preserved in 96% ethanol. Concurrently, environmental adult flies were collected from the immediate vicinity where the infested dragon was encountered. This collection was conducted over a single day on April 25, 2025, at two specific sampling times (10:00 AM and 3:00 PM), with each trapping session lasting for exactly 30 min. This sampling schedule was dictated by the logistical constraints of the concurrent Komodo dragon population monitoring program, as the field team followed a set daily route on foot across forested terrain to check 8 to 11 widely distributed trap units both in the morning and afternoon. The adult flies were opportunistically attracted to the exact same approximately 1 kg of goat meat bait, suspended in a plastic bag, that was actively utilised for the Komodo dragon traps. These flies were captured manually by covering them with a clear plastic bag and preserved in ethanol.

The larval rearing process, initial morphological sorting, and preliminary identification of all captured specimens (both larvae and adult flies) were conducted in situ at the field research station in Loh Buaya using a stereomicroscope (Olympus SZ61, Tokyo, Japan). Preliminary photographic documentation during this in situ observation was captured through the stereomicroscope using a smartphone camera (iPhone 12, Apple Inc., Cupertino, CA, USA). To strictly comply with regulatory constraints regarding the access and transport of biological samples derived from protected wildlife while ensuring taxonomic accuracy, only representative subsets were selected for further analysis. Specifically, a subset of 20 cultured third-instar larvae and 5 individuals of each adult fly morphotype were subsequently transported to the Laboratory of Parasitology, Faculty of Veterinary Medicine, Universitas Gadjah Mada, Yogyakarta. At the university laboratory, these specimens underwent rigorous definitive taxonomic identification using an identical stereomicroscope model, and photographic documentation was captured utilising an Indomicro HDMI camera (Indomicro, Indonesia) to scientifically validate and confirm the preliminary field results.

Morphological identification of the larvae and adult flies was performed under a stereomicroscope, using the taxonomic keys provided by Akbarzadeh et al. (2015) and Animal Health Australia (2017). The larvae collected from the wound were identified as second-instar larvae. Some specimens were reared to the third instar stage for morphological identification purposes. The cultured larvae (Fig. 2) were identified as *Chrysomya rufifacies*. The hairy maggot was confirmed as *C. rufifacies* by the presence of prominent fleshy tubercles with apical spines on the dorsal and lateral surfaces of the third-instar larvae (Fig. 2d). These morphological features distinguish the specimen from the closely related *Chrysomya albiceps* (Wiedemann, 1819; Diptera: Calliphoridae).

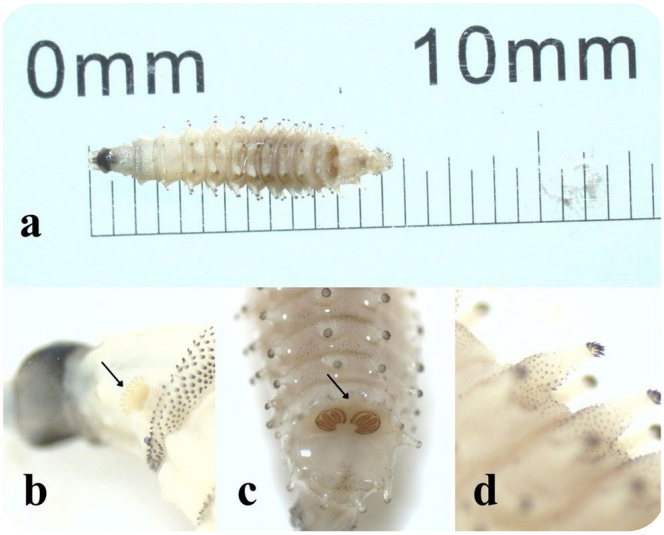


Figure 2: Hairy maggot; third instar larvae of Chrysomya rufifacies: (a) habitus, (b) anterior spiracle (arrow), (c) posterior spiracles (arrow), (d) fleshy tubercles

A total of 48 adult flies were collected from the surrounding environment at Loh Buaya, Rinca Island (Table 1). Although these environmental flies cannot be directly linked to the specific infestation on the Komodo dragon, they represent species well-

documented as opportunistic agents of myiasis in various animals (Hall and Wall 1995; Zumpt 1965). The species were distributed as follows: *Chrysomya rufifacies* was the most prevalent, comprising 26 individuals (54%), followed by *Chrysomya megacephala* with 17 individuals (35%), and *Sarcophaga* sp. with 5 individuals (10%).

No.	Species	Number of individuals	Percentage (%)
1.	*Chrysomya rufifacies*	26	54
2.	*Chrysomya megacephala*	17	35
3.	*Sarcophaga sp.*	5	10
	TOTAL	48	100

Table 1: Species composition of adult flies captured near the Komodo dragon trapping site at Loh Buaya, Rinca Island

Total percentage may not equal exactly 100% due to rounding

Discussion and conclusions

The presence of second-instar larvae provides an estimate for the time since colonisation (post-infestation interval) by *C. rufifacies*. On the basis of previous studies, this developmental stage is generally consistent with a post-infestation interval of approximately two to three days (Siddiki and Zambare 2017; Hu et al. 2019). However, this estimate should be interpreted with caution. As this was an opportunistic finding, precise microenvironmental data (such as ambient temperature and humidity) were not recorded, precluding the calculation of Accumulated Degree Days (ADD). Larval development in the field may vary significantly depending on these specific local conditions. Furthermore, since *C. rufifacies* is a well-known secondary invader that colonises pre-existing wounds, the initial injury experienced by the Komodo dragon likely predates this infestation by an indeterminate period.

The identification of *C. rufifacies* as the primary agent in this case aligns with its role as a frequent cause of myiasis in reptiles and other vertebrates in tropical and subtropical regions (Farkas and Hall 1998). Compared to its closely related *C. albiceps*, *C. rufifacies* is the dominant 'hairy maggot' blow fly in the Oriental region (Baumgartner 1993; Yanmanee et al. 2016; Animal Health Australia 2017). This hairy maggot is recognised as an aggressive secondary invader capable of colonising pre-existing wounds (Bambaradeniya et al. 2025), thereby exacerbating tissue damage. Larval infestation may result in tissue destruction (Uslu et al. 2025), secondary bacterial infections (RomeroCabello et al. 2010), and systemic illness. Such conditions can weaken individuals, potentially reducing their hunting efficiency, mating capability, and survival. The presence of blow fly larvae in pre-existing wounds can exacerbate tissue damage and potentially pose life-threatening risks to the host (Hughes and Delis 2014).

Although only *C. rufifacies* was successfully reared and identified from the collected larvae, the involvement of additional fly species cannot be excluded. The primary fly families associated with myiasis include Calliphoridae (blow flies), Sarcophagidae (flesh flies), and Oestridae (botflies) (Zumpt 1965; Hall and Wall 1995). Beyond mammals, dipteran larvae from families such as Calliphoridae and Sarcophagidae have been increasingly reported to cause both obligate and facultative myiasis in various herpetofauna, including several amphibian species across different continents (de Souza-Pinto et al. 2015; Müller et al. 2015; Thompson et al. 2021; Vélez et al. 2025).

Three fly species were captured on the island as potential agents of myiasis (Fig. 3): *C. rufifacies*, *C. megacephala*, and *Sarcophaga* sp. All these myiasis-causing flies represent significant potential threats to reptile health in Komodo National Park. The dominance of *C. rufifacies* is noteworthy, as this species is a facultative parasite and one of the main agents of traumatic myiasis in animals (Baumgartner 1993). Meanwhile, *C. megacephala* is primarily a saprophagous species but has also been implicated in secondary myiasis (Fernandes et al. 2009). The presence of facultative parasitic flies, such as *Sarcophaga* spp., although less abundant, may also contribute to opportunistic infestations in wounds (Kumara et al. 2012).

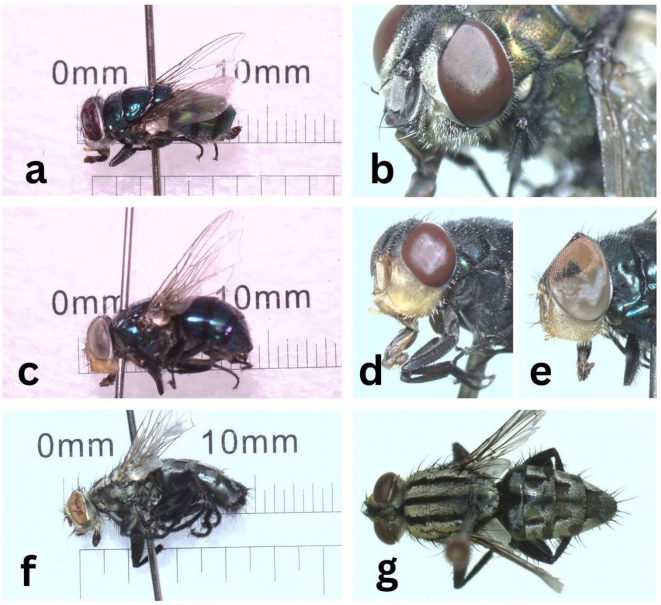


Figure 3: a-b: Chrysomya rufifacies, (a) lateral view, (b) anterior view, showing face and cheek covered by silvery hairs, and white anterior spiracle; c-e: Chrysomya megacephala, showing dark lower squamae, (c) lateral view, showing dark anterior spiracle, (d) female, (e) male showing typical demarcated large and small facets eye; f-g: Sarcophaga sp., (f) lateral view, (g) dorsal view showing abdomen with checkerboard pattern

Various ecological and biological factors put Komodo dragons at possible risk of myiasis. Komodo dragons are known for their aggressive hunting strategies and territorial behaviour, both of which frequently result in injuries (Auffenberg 1981). These wounds increase susceptibility to myiasis. Open wounds serve as ideal sites for fly oviposition and larval colonisation (Hall and Wall 1995). Furthermore, Komodo dragons inhabit tropical savannas, mangrove forests, and monsoon forests (Auffenberg 1980), and the tropical climate of Komodo National Park, with its high temperatures and humidity, accelerates fly development and enhances larval survival (Wardhana et al. 2014; Yanmanee et al. 2016; Hadura et al. 2018).

Similar trends have been noted in other tropical reptiles, where climate and opportunistic flies significantly elevate the risk of infestation.

The impact of myiasis on wild reptiles remains largely unrecognised. Myiasis has been documented in a range of reptile species (Gould and Georgi 1991; Knotek et al. 2005; Dehghani et al. 2012; Doronin et al. 2020; Alvaro et al. 2025), although reports remain relatively scarce compared to those in mammals. Reports of traumatic myiasis in reptiles have been documented primarily in chelonians, such as Hermann's tortoises (Testudo hermanni) and box turtles (Terrapene ornata), where infestations often lead to severe tissue necrosis or even fatalities (Sales et al. 2003; Knotek et al. 2005; O'Toole et al. 2021). Cases in snakes, turtles, and lizards have been primarily attributed to wounds that provide entry sites for oviposition (Doronin et al. 2020; Lubian et al. 2025).

These cases share common ecological and biological risk factors, including warm climates, open wounds, and the presence of opportunistic facultative fly species in the shared environment. Compared with these reports, the case in Komodo dragons is unique due to the species' ecological role as a top predator and its conservation importance as an endemic and vulnerable reptile (Jessop et al. 2021). The occurrence of myiasis in this case highlights the susceptibility of Komodo dragons to opportunistic infestations, especially when a wound remains untreated in their natural environment. While myiasis in smaller reptiles or captive individuals may often be treated, wild Komodo dragons present significant challenges to intervention due to handling difficulties, limited resources, and the risk of disrupting natural behaviours (Kirkwood and Sainsbury 1996).

Initially, the odour of fresh blood and serum exudates from open wounds strongly attracts primary fly species. Subsequently, wound debris and dead tissue serve as powerful attractants for facultative, saprophagous fly species (secondary invaders) like *C. rufifacies*. Once established, the colonising larvae initially feed on the necrotic substrate; however, as they develop, they can extend their feeding activity into adjacent living tissues, thereby significantly expanding the margins of the pre-existing wound and necessitating intensive treatment (Szpila et al. 2014; Pezzi et al. 2015; Uslu et al. 2025).

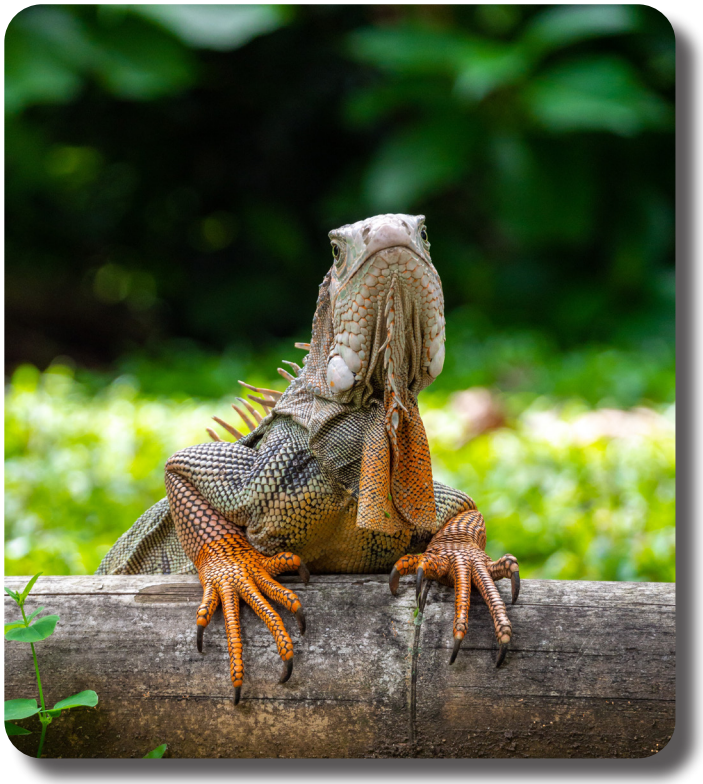
Veterinary intervention is essential for both captive and monitored wild populations of Komodo dragons. In zoological facilities, routine health checks, wound management, and environmental controls are crucial for reducing fly breeding and minimising the risk of infestation (Hall and Wall 1995; Jacobson 2007). In wild populations, interventions must be approached cautiously, as intensive management can alter population dynamics and ecosystem balance (Smith et al. 2009). Instead, preventive ecological approaches, including habitat management to limit fly breeding sites, non-invasive health surveillance, and research into the diversity and distribution of fly species offer more sustainable solutions (Hall and Wall 1995; Schilling et al. 2022).

Climate change may exacerbate this issue by altering the distribution and life cycles of dipteran species. Rising temperatures and increased humidity in tropical regions can accelerate larval development and extend breeding seasons, thereby increasing the risk of infestation in susceptible wildlife (Wardhana et al. 2014). For species with restricted ranges, such as the Komodo dragon, these ecological changes may represent an additional long-term threat.

This case underscores the importance of a multidisciplinary approach to the management of wild Komodo dragon populations. Such an approach should consider the potential impact of myiasis on the success and survival of this vulnerable reptile by integrating the disciplines of veterinary medicine, conservation biology, and ecological research. Furthermore, recognising these opportunistic infestations aligns with the One Health framework, highlighting the interconnectedness of wildlife and environmental health within shared ecosystems like Komodo National Park.

This study has several limitations. First, the observation is based on a single case, which limits the generalizability of the findings. Second, follow-up monitoring of the affected individual was not possible, preventing assessment of clinical progression and long-term outcomes. Third, the limited sampling and field conditions may have constrained the detection of additional myiasis-causing species. Despite these limitations, this report, to the best of our knowledge, provides the first documented evidence of myiasis in a wild Komodo dragon. This finding indicates that wounds in wild individuals may be susceptible to infestation by opportunistic dipterans under natural conditions. While the broader epidemiological significance remains unclear, this case highlights the need for further investigation into the occurrence, risk factors, and potential impacts of myiasis in Komodo dragon populations. Future surveillance should ideally incorporate molecular techniques to provide supplementary genetic data.

References available on request



SD-OCT diagnosis of optic nerve head drusen and pseudopapilledema associated with advanced chorioretinopathy in a dog: case report

Jowita Zwolska · Wiktoria Teodorowska · Barbara Kuduk · Martyna Padjasek · Ireneusz Balicki

Abstract Background Unilateral pseudopapilledema and optic nerve head drusen (ONHD) are uncommon findings in dogs and can closely mimic true optic disc oedema, which may lead to diagnostic uncertainty and ineffective anti-inflammatory treatment. Spectral-domain optical coherence tomography (SD-OCT) has emerged as a valuable tool for differentiating pseudopapilledema from papilledema by enabling detailed in vivo assessment of the optic nerve head. This case report presents a young mixed-breed dog with suspected retinal detachment and apparent optic disc swelling, in which SD-OCT supported the diagnosis of unilateral pseudopapilledema/ONHD, with advanced chorioretinopathy documented as an additional, case-specific finding. Two complete ophthalmic examinations were performed 10 months apart, including funduscopy and spectral-domain optical coherence tomography (SD-OCT). In addition, electroretinography (ERG) was performed twice, 14 months apart, while ultrasonography (USG) and magnetic resonance imaging (MRI) were each conducted once.

Results Funduscopic evaluation revealed multiple chorioretinal lesions and optic disc elevation with blurred margins. SD-OCT identified hyperreflective drusen within the optic nerve head (ONHD), peripapillary hyperreflective ovoid mass-like structures (PHOMS), and localised retinal thinning. SD-OCT-based morphometric analysis revealed retinal thinning, while ERG demonstrated photoreceptor dysfunction. Ocular B-scan ultrasonography demonstrated a well-defined hyperechoic lesion within the optic nerve head of the left eye, consistent with optic nerve head drusen, with no analogous findings in the right eye. MRI showed no evidence of disturbed cerebrospinal fluid flow, and no inflammatory or structural abnormalities were detected within the brain or optic nerves.

Conclusion This is the first canine case in which ONHD was primarily detected and characterised using SDOCT. The modality enabled precise, non-invasive longitudinal monitoring of structural and morphometric retinal changes, allowing differentiation of ONHD from true optic disc oedema and other optic neuropathies. SD-OCT represents a valuable tool for veterinary ophthalmology, particularly in cases of unexplained optic disc elevation.

Introduction

Optic disc elevation is a frequent clinical finding that may result from true optic disc oedema or from pseudopapilledema, commonly caused by optic nerve head drusen (ONHD). Distinguishing between these two entities can be challenging, as both may present with blurred disc margins and elevation of the optic nerve head on funduscopic examination. In dogs, optic neuritis and other inflammatory optic neuropathies represent important differential diagnoses for optic nerve head abnormalities.

These conditions may be associated with optic disc swelling, indistinct disc margins, peripapillary oedema, visual deficits, and subsequent retinal nerve fibre layer loss, and should therefore be considered when interpreting structural changes of the optic nerve head. Relying solely on funduscopic appearance and patient history often leads to diagnostic uncertainty, since the key differentiating features - such as disc colour, vascular congestion, or subtle topographical variations - may be difficult to evaluate without advanced imaging [1–3]. Accurate differentiation is crucial, however, as true papilledema usually indicates increased intracranial pressure and requires urgent investigation, whereas pseudopapilledema is a benign condition associated with deposits within the optic nerve head [4, 5].

Optic nerve head drusen are acellular deposits composed primarily of calcium, mucopolysaccharides, and amino acids such as arginine, tryptophan, and tyrosine [1, 6]. They can occur superficially, where they are visible upon ophthalmoscopic examination, or deeply within the optic disc, where they may mimic papilledema [5, 7].

The pathogenesis remains uncertain, though impaired axoplasmic transport and subsequent mitochondrial calcification have been proposed as potential mechanisms [8].

Over the years, several diagnostic modalities have been employed to identify and differentiate ONHD from true optic disc oedema. B-scan ultrasonography has traditionally been used for the detection of calcified optic nerve head drusen owing to its ability to demonstrate hyperreflective foci with posterior acoustic shadowing, while its utility in identifying non-calcified drusen is limited [9, 10]. Other techniques, including fluorescein angiography, scanning laser ophthalmoscopy, and computed tomography, have also contributed to diagnostic accuracy, particularly in detecting superficial drusen. However, the sensitivity of fluorescein angiography for the detection of optic nerve head drusen is lower than that of ultrasonography [2, 3, 11].

More recently, optical coherence tomography, particularly in its spectral-domain form, has emerged as a valuable non-invasive imaging tool capable of visualising both superficial and buried drusen, as well as quantifying retinal nerve fibre layer thickness, and is currently regarded as the gold standard for the evaluation of optic nerve head drusen [5, 12].

In veterinary ophthalmology, reports of optic nerve head drusen remain exceedingly rare. To date, ONHD in dogs have primarily been described using computed tomography or ultrasonography, but not with SD-OCT [13]. This case report describes a dog with optic nerve head drusen (ONHD) in which advanced chorioretinopathy was additionally identified and was considered presumptively unrelated to the ONHD, based on spectral-domain optical coherence tomography (SD-OCT) findings.

>>>32

Case report

A 3-year-old male mixed-breed dog weighing 21 kg, of unknown medical history, adopted from a shelter, was presented with suspected retinal detachment and optic disc oedema. The dog showed no improvement after anti-inflammatory therapy. Treatment consisted of systemic corticosteroid therapy using prednisone at a dose of 1 mg/ kg body weight per day, administered orally for two weeks, followed by a gradual taper. According to the owner, the initial clinical concern was night vision impairment. Two complete ophthalmic examinations were performed 10 months apart. Each examination included funduscopy (using a binocular indirect ophthalmoscope [Keeler, UK], a direct ophthalmoscope [Welch Allyn, USA], and a PanOptic ophthalmoscope [Welch Allyn, USA]) and SD-OCT (Topcon 3D OCT-2000, Topcon, Japan). In addition, electroretinography (ERG), with the use of the LKC RETevet system (LKC Technologies, USA), was performed twice, 14 months apart. Ultrasonography (USG) [Vinno G65, Norax] and magnetic resonance imaging (MRI) [GE Optima MR450w 1.5T, GE Medical Systems Polska Sp. z o.o., Warsaw, Poland] were each performed once. The animal owner provided written informed consent for enrollment in the study, procedures and therapy undertaken, and publication of data and images. SDOCT-based retinal morphology and morphometry were compared with data obtained from 11 healthy control mixed-breed dogs of comparable body weight (18–24 kg) and age (2–4 years). Complete blood count and serum biochemistry results were within normal limits.

The ophthalmic evaluation included assessments of menace response, dazzle reflex, tracking reflex, and visual placing reflex, as well as an obstacle course test. The obstacle course was conducted first under scotopic and then under photopic conditions. Chromatic pupillary light reflexes were tested using a BPI-50 Precision Illuminator (RetinoGraphics Inc., USA). All the aforementioned reflexes and responses were intact. Schirmer's Tear Test (Eickemeyer, Germany) and intraocular pressure measurements obtained with a TonoVet rebound tonometer (iCare, Finland) were within normal ranges in both eyes. Slit-lamp biomicroscopy revealed no abnormalities in the anterior segment of either eye.

Funduscopic findings

Funduscopic examination revealed chorioretinal lesions that differed slightly between the right and left eyes (Fig. 1). In the right eye, two well-demarcated areas of tapetal hyperreflectivity with a pigmented centre were observed. Additionally, two further oval hyperreflective areas were present in the dorsotemporal region. Abnormal retinal pigmentation was also noted within the tapetal fundus. Two well-demarcated areas of depigmentation were present: one at the tapetal-non-tapetal border within the non-tapetal fundus of the ventrotemporal region, and the other within the non-tapetal fundus of the ventronasal region. In the left eye, three areas of tapetal hyperreflectivity with a pigmented centre were identified in the dorsotemporal region. As in the right eye, abnormal retinal pigmentation was evident in the tapetal fundus. Furthermore, elevation and blurring of the optic disc margins were observed. During the subsequent funduscopic examination, in the right eye, slight thinning of the retinal blood vessels was observed compared to the previous examination. The chorioretinal lesions' appearance remained comparable, although progression of abnormal tapetal pigmentation was noted. In the left eye, the funduscopic findings were comparable to those observed during the previous examination.

Electroretinography

Two ERG examinations were performed using the LKC RETevet system (LKC Technologies, USA) in accordance with the ECVO 5-step protocol. Electroretinography (ERG) was performed twice, at a 14-month interval, as part of the diagnostic evaluation and longitudinal follow-up of suspected retinopathy to assess changes in retinal function over time. Before testing, the pupils were dilated with topical tropicamide (Tropicamidum WZF 1%, Polfa Warszawa S.A., Poland). Anaesthesia was induced using intramuscular dexmedetomidine (Dexdomitor, Orion Pharma, Espoo, Finland) at 2.5 µg/kg and butorphanol (Butomidor, Richter Pharma AG, Wels, Austria) at 0.2 mg/kg, followed by intravenous propofol (Propofol-Lipuro, B. Braun Melsungen AG, Melsungen, Germany) at 1 mg/kg for induction. After endotracheal intubation, general anaesthesia was maintained with 1% isoflurane (IsoFlo, Zoetis, Louvain-la-Neuve, Belgium). Corneal anaesthesia was achieved using 0.5% proxymetacaine hydrochloride (Alcaine 5 mg/mL, Alcon, Warsaw, Poland). The right eye was examined first. In the rod response protocol (white flash, 0.01 cd·s/m^2, 0.2 Hz, dark adaptation 20 min, no background), both eyes demonstrated reduced amplitudes with normal implicit times. Compared with the initial ERG, the amplitude in the right eye decreased by approximately 70% from baseline, while the left eye showed a reduction of around 20%. A similar amplitude reduction was observed in the cone response protocol (white flash, 3.0 cd·s/m^2, 2 Hz, light adaptation 10 min, background 30 cd/m^2), with approximately 80% reduction in the right eye and 20% in the left eye. These findings indicated bilateral photoreceptor dysfunction, more pronounced in the right eye (Fig. 2).

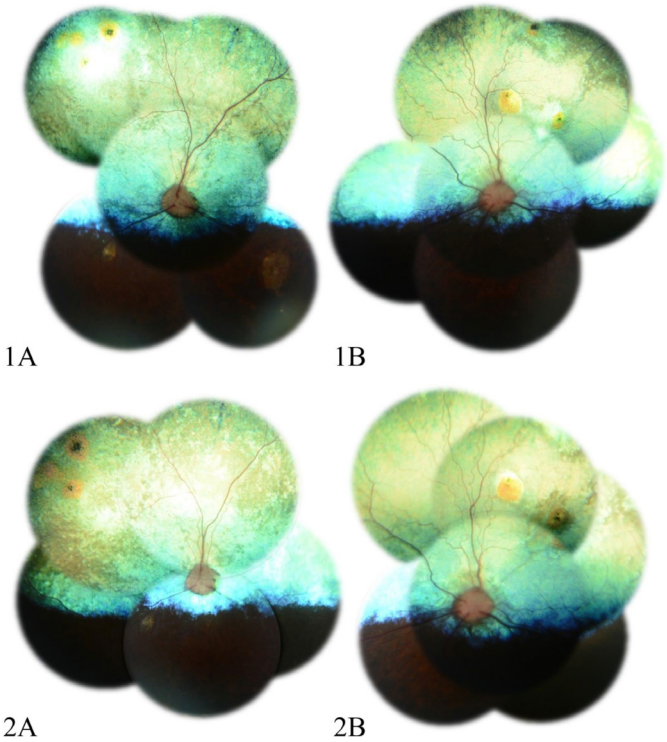


Figure 1: Fundus photographs of the right (A) and left (B) eyes obtained during the first (1) and second (2) examinations.

Optical coherence tomography

SD-OCT examinations were performed twice-initially on the day of the first visit and again 10 months later. Pupillary dilation was achieved using tropicamide (Tropicamidum WZF 1%, Polfa

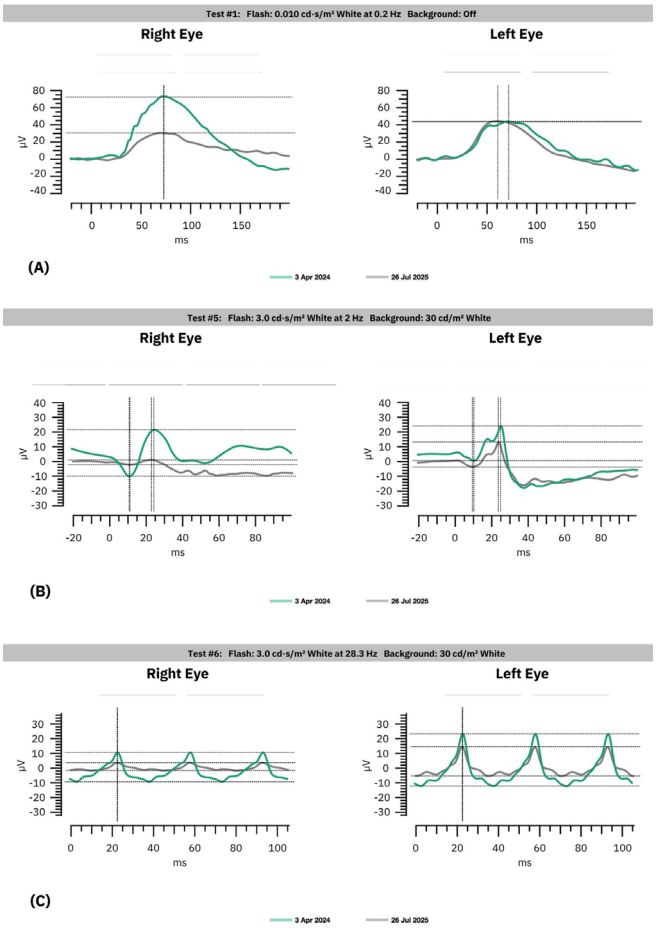


Figure 2: Scotopic single-flash rod responses (A), photopic single-flash cone responses (B), and cone flicker responses (C) recorded from the right and left eyes during two electroretinographic examinations performed 14 months apart.

Warszawa S.A., Poland). The procedure was carried out under sedation using intramuscular medetomidine at a dose of 15 µg/kg body weight (Domitor 1 mg/mL, Orion Pharma, Finland). Topical anaesthesia of the cornea and conjunctiva was induced using 0.5% proxymetacaine hydrochloride (Alcaine 5 mg/mL, Alcon, Warsaw, Poland). The eye was stabilised by gently grasping the bulbar conjunctiva with thumb forceps. For detailed evaluation of retinal and optic disc structures, linear, 6-line radial, cross-sectional, and 3D scans (λ = 840 nm; enhanced depth imaging mode; Topcon 3D OCT-2000; Topcon, Japan) were obtained. During imaging, the cornea was kept moist with saline drops applied every 30 s to prevent desiccation and ensure optimal image quality.

Measurements of retinal layers were performed in the left eye, where ONHD were present in the peripapillary region. The following retinal layers were analyzed: internal limiting membrane + nerve fiber layer (ILM + NFL), ganglion cell layer (GCL), inner plexiform layer (IPL), inner nuclear layer (INL), outer plexiform layer (OPL), outer nuclear layer (ONL), photoreceptor layers including external limiting membrane (ELM), myoid zone (MZ), ellipsoid zone (EZ), outer photoreceptor segment (OPRS), and interdigitation zone (IZ), outer retina (OR; OPL + ONL + ELM + MZ + EZ + OPRS + IZ), and total retinal thickness (TRT), measured from the internal limiting membrane to the interdigitation zone, excluding the retinal pigment epithelium–Bruch's membrane–choriocapillaris complex (RPE–BmCc).

During the first SD-OCT examination, multiple chorioretinal lesions were detected in the right eye, localised in the temporal tapetal region and at the tapetal–non-tapetal border.

Within these chorioretinal lesions, advanced retinal atrophy with thinning and disorganisation of the retinal layers was observed. Segmental thinning of the outer nuclear layer (ONL) was noted, accompanied by loss and disorganisation of the inner retinal layers (MZ, EZ, OPRS, IZ) in the dorsotemporal and non-tapetal fundus. A lamellar retinal tear and an adjacent retinal hole were identified in the dorsotemporal region of the left eye. The retina in the area surrounding the hole was thickened. The retinal layers adjacent to the retinal tear and hole were disorganised. Both the hole and tear extended to the outer nuclear layer (ONL). In the case of the retinal tear, the ONL, ellipsoid zone (EZ), outer photoreceptor segments (OPRS), and interdigitation zone (IZ) were disorganised (Fig. 3A and B).

In the left eye, multiple chorioretinal lesions were detected in the dorsal region. The retina surrounding the lesions exhibited ongoing disorganisation and thinning of retinal layers. SD-OCT performed

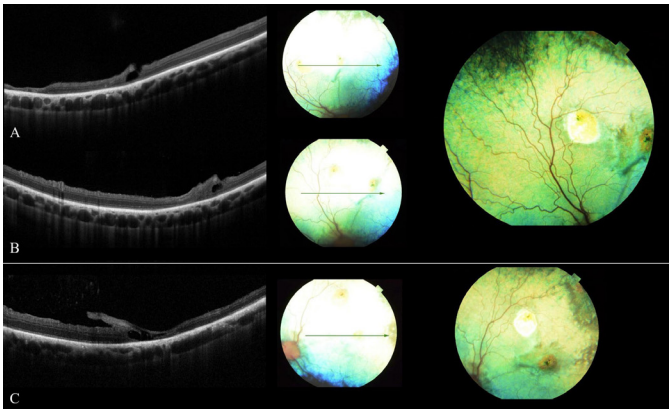


Figure 3: Retinal tear (A) and adjacent retinal hole (B) located in the dorsotemporal region of the left eye. Enlargement of both the tear and the hole was documented during the second SD-OCT examination (C).

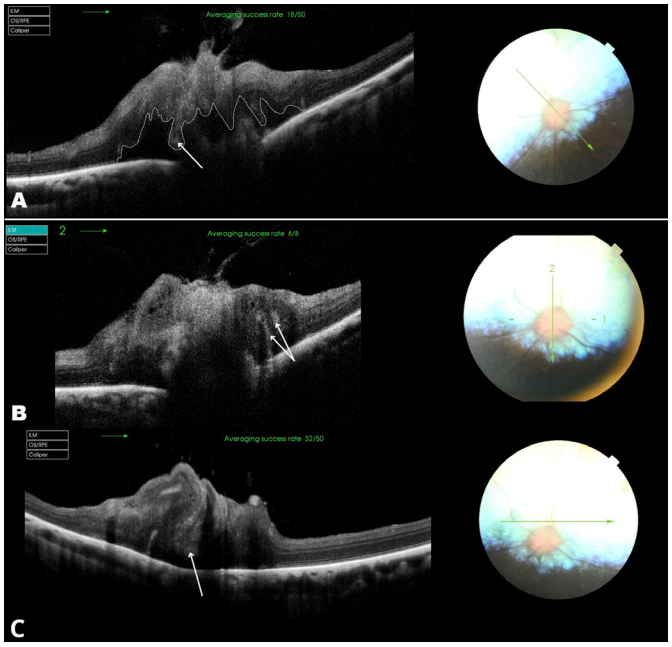


Figure 4: Spectral-domain optical coherence tomography (SD-OCT) scans from the first (A, B) and second (C) examinations. Optic nerve head drusen (ONHD) within the optic nerve head are indicated by white arrows in images A and B. A peripapillary hyperreflective ovoid mass-like structure (PHOMS) is marked by a white arrow in image C. The irregular internal contour of the optic nerve head, outlined by a white line in image A, is consistent with pseudopapilledema.

during the first examination revealed multiple hyperreflective structures within the optic nerve head consistent with optic nerve head drusen (ONHD), located both superficially and at deeper levels of the prelaminar region. The internal contour of the optic nerve head was irregular, with elevation and blurred margins, findings consistent with pseudopapilledema rather than true optic disc oedema. Peripapillary retinal nerve fibre layer (RNFL) thickness measurements were obtained, allowing quantitative assessment of neuroaxonal integrity (Fig. 4). Retinal schisis between the ILM/NFL and GCL layers was observed in the peripapillary region. A Bergmeister's papilla was visible at the optic nerve apex, representing a physiological finding. The optic nerve head appeared elevated, with an irregular internal contour consistent with pseudopapilledema (Fig. 4A).

In the follow-up SD-OCT examination, the right eye exhibited areas of advanced retinal atrophy in the nontapetal regions. Segmental thinning of the ONL and progressive disorganisation of the retinal layers were also evident in the peripapillary region. Both the retinal tear and the retinal hole increased in size. Temporally beyond the hole, the retina exhibited advanced thinning and disorganisation of the retinal layers. (Fig. 3C). On follow-up SD-OCT examination, persistent optic nerve head elevation was observed. In addition, a peripapillary hyperreflective ovoid mass-like structure (PHOMS) was identified adjacent to the optic nerve head. The overall OCT appearance remained stable over time, supporting a non-inflammatory and non-progressive process (Fig. 4). SDOCT assessment of the choroid in well-demarcated areas of tapetal hyperreflectivity with central pigmentation in the tapetal fundus, as well as in areas of depigmentation in the non- tapetal fundus, was associated with retinal and choroidal atrophy in both eyes. The choroid was thinner than in surrounding regions, particularly in the large vessel layer. Morphometric analysis of retinal layers in the left eye with ONHD revealed thinning of the peripapillary retina after 10 months, with a 14% reduction in the ILM + NFL+GCL layers and a 12.5% decrease in the IPL thickness (Table 1).

Ultrasonography

Ocular ultrasonography (Vinno G65, Norax) was performed immediately after the initial SD-OCT examination. During the examination, the optic nerve head region was carefully assessed for the presence of hyperechoic structures and lesions protruding toward the vitreous cavity, which are characteristic features of optic nerve head drusen. In the left eye, a well-defined hyperechoic structure was identified within the optic nerve head, causing focal protrusion toward the vitreous cavity (Fig. 5). These ultrasonographic findings were consistent with optic nerve head drusen. No hyperechoic lesions were detected in the optic nerve head region of the right eye.

Magnetic resonance imaging

Magnetic resonance imaging (MRI) of the head was performed two weeks after the initial OCT examination using a high-field 1.5 T GE system [GE Optima MR450w 1.5T, GE Medical Systems Polska Sp. z o.o., Warsaw, Poland]. The protocol included FSE sequences in T1-weighted (sagittal, coronal, and transverse planes), T2-weighted (sagittal, coronal, and transverse planes), T2*-weighted (transverse plane), FLAIR (coronal plane), DWI (transverse plane), and ADC (transverse plane) images. Post-contrast imaging was obtained using T1-weighted (sagittal, coronal, and transverse planes) and FLAIR (coronal plane) sequences following intravenous administration of contrast medium (Dotagraf, 0.5 mmol/ml; Bayer Pharma AG, Berlin, Germany). The retrobulbar spaces were unremarkable, and both optic nerves showed no detectable abnormalities. The cerebrospinal fluid–filled perineural subarachnoid spaces surrounding the optic nerves were of normal width throughout their visible course. Mild asymmetry of the lateral cerebral ventricles was observed, without evidence of disturbed cerebrospinal fluid flow, most likely representing a normal anatomic variant. No inflammatory or structural abnormalities were identified within the brain or optic nerves.

	ILM + NFL	GCL	ILM + NFL +GCL	IPL	INL	OPL	ONL	ELM	MZ	EZ	IZ	PR+	TRT
Control	12	18	35	40	17	13	56	9	10	12	16	46	201
SD-OCT 1	15	20	35	40	12	13	62	10	11	17	16	54	214
SD-OCT 2	12	18	30	35	14	14	62	9	9	15	16	49	204

Table 1 Measurements of individual retinal layers and total retinal thickness [µm] in the peripapillary region in the control group and in the clinical case during the first and second SD-OCT examinations

Discussion

Optic neuritis and inflammatory optic neuropathies are important differential diagnoses for the optic nerve head changes observed in this case. In dogs, optic neuritis is typically associated with acute visual dysfunction, abnormal pupillary light reflexes, and, when the optic nerve head is involved, optic disc hyperemia, swelling, indistinct disc margins, venous dilation, haemorrhage, exudation, and possible extension of inflammation to the retina as neuroretinitis [14]. In a large canine case series of 96 dogs with optic neuritis, Smith et al. reported optic nerve head elevation in 92 cases, peripapillary retinal oedema or separation in 37 cases, retinal haemorrhage or vascular dilation

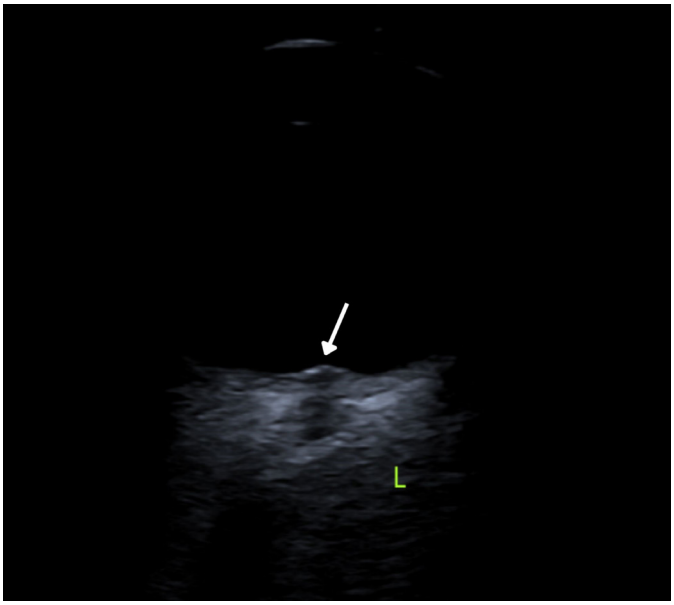


Figure 5: Ultrasonography of the left eye, in which optic nerve head drusen were diagnosed. A hyperechoic lesion within the optic nerve head protruding toward the vitreous cavity is visible (white arrow)

in 23 cases, and multiple inflammatory foci in the peripapillary region in 13 cases [15]. Grozdanic et al. also reported that canine optic neuritis may be associated with absent chromatic pupillary light reflex responses, concurrent focal chorioretinal lesions, and, in histologically examined eyes, optic nerve vasculitis and ischemic necrosis [16]. These findings partially overlap with the fundoscopic and OCT abnormalities observed in the present case.

However, several findings in this dog supported the presence of optic nerve head drusen rather than active optic neuritis, including the focal, well-defined hyperreflective material within the optic nerve head on OCT, the echogenic appearance of the lesion on ocular ultrasonography, and the absence of clinical, neurological, or MRI findings suggestive of active optic nerve inflammation.

In addition, the patient did not present with acute-onset blindness, and the chorioretinal lesions were bilateral, whereas the optic nerve head deposits were unilateral. In this patient, the optic nerve head drusen were accompanied by the presence of PHOMS. In ONHD, acellular and calcified deposits may impede normal axoplasmic transport and result in the formation of PHOMS [17, 18]. Therefore, although previous or subclinical inflammatory optic neuropathy cannot be completely excluded, the multimodal imaging findings were considered most consistent with optic nerve head drusen/deposits.

Histopathological examination would be required to definitively characterise the composition of this material and to determine whether it represented mineralised drusen, another type of intrapapillary deposit, or a sequela of previous optic nerve pathology. In the present case, however, the irregular contour of the optic nerve head, absence of anterior displacement or elevation of the lamina cribrosa, and OCT findings consistent with ONHD and PHOMS favoured pseudopapilledema associated with optic nerve head drusen rather than true optic disc oedema secondary to active optic neuritis.

Optic nerve head drusen are acellular, usually calcified deposits located anterior to the lamina cribrosa, commonly associated with pseudopapilledema. Visual field defects are a common consequence of ONHD in humans. Studies report that 63.2% of eyes with ONHD exhibit visual field deficits, while abnormal visual evoked potentials are observed in 44.7% of eyes with visible drusen and 20% with buried drusen. Although most eyes with ONHD progress slowly, approximately 12% may show moderate to rapid visual field loss [19]. In the present case, ERG revealed a 20% reduction in photoreceptor cell function in the eye affected by drusen. However, due to the presence of concurrent chorioretinal lesions of unknown origin, it is not possible to determine to what extent the observed ERG abnormalities were directly attributable to the drusen themselves.

In the present case, ophthalmic examination revealed preserved visual function, with intact menace response, dazzle reflex, tracking and visual placing reflexes, as well as normal performance on an obstacle course under both scotopic and photopic conditions. Chromatic pupillary light reflexes were within normal limits bilaterally. It should be emphasised that the absence of visual deficits and normal pupillary light reflexes (PLRs) does not exclude papilledema, particularly when associated with intracranial hypertension. In contrast to optic neuritis, papilledema represents a passive swelling of the optic nerve head secondary to increased intracranial pressure and may initially occur without functional impairment of the optic nerve. Consequently, visual deficits and PLR abnormalities are not obligatory findings, especially in early or moderate stages of the disease [4, 5, 7]. In the present case, preserved chromatic PLRs argue against a primary inflammatory optic neuropathy. The observed visual dysfunction was instead supported by abnormal electroretinography findings consistent with chorioretinopathy, indicating a retinal rather than optic nerve origin of visual impairment. Therefore, normal PLRs do not rule out papilledema but rather support the absence of clinically significant optic nerve dysfunction.

Morphometric analysis of the retinal layers over 10 months demonstrated thinning of the peripapillary retina, with a 14% reduction in ILM + NFL+GCL layers and a 12.5% reduction in IPL thickness. These findings parallel observations in humans with ONHD, where peripapillary NFL thinning progresses in correlation with age [20].

The relationship between ONHD and the concurrent advanced chorioretinopathy remains uncertain because no previous ophthalmic history was available for the presented dog. Chronic changes in the peripapillary retina and choroid could affect local hemodynamics and axoplasmic transport. However, in this case, the chorioretinopathy was bilateral, whereas ONHD was unilateral, making a direct causal relationship unlikely. Therefore, these findings were interpreted as concurrent, but not necessarily causally related.

Differentiation between true optic disc oedema and pseudopapilledema is critical, as it has significant implications for patient management. Misdiagnosis may lead to unnecessary and potentially invasive diagnostic procedures. Superficial drusen are occasionally visible during ophthalmoscopy, yet deeply buried ones may remain undetected without the aid of advanced imaging modalities. In our case, ocular B-scan ultrasonography identified a well-defined hyperechoic structure within the optic nerve head

>>>36

of the left eye, causing focal protrusion toward the vitreous cavity, consistent with optic nerve head drusen, while no such lesions were observed in the right eye. It is observed that in patients with intracranial hypertension, OCT can demonstrate a deflection of Bruch's membrane toward the vitreous, which helps differentiate papilledema from pseudopapilledema. However, in our clinical case, no displacement of Bruch's membrane was observed. True optic disc oedema is characterised by an elevated optic nerve head with a smooth internal contour, whereas pseudopapilledema associated with ONHD presents as an elevated optic nerve head with irregular internal contour on SD-OCT imaging [21]. In the present case, SD-OCT revealed the presence of ONHD, identified as sharply demarcated hyperreflective deposits within the optic nerve head, as well as PHOMS visualised as ovoid hyperreflective formations in the peripapillary area. Moreover, SD-OCT confirmed the presence of an irregular internal contour, consistent with pseudopapilledema.

In veterinary medicine, the diagnosis of ONHD has been rare and dependent on ultrasonography or computed tomography. Ramírez et al. were among the first to describe calcified drusen in a dog using CT, where they appeared as hyperdense foci consistent with optic nerve calcification [22]. Comparable hyperdense calcified deposits have been documented in human studies, reinforcing the morphological similarities between species [23, 24]. More recently, Niranjana et al. reported the incidental discovery of bilateral optic nerve head drusen in a six-year-old Rottweiler during head CT examination [13]. Characteristic discrete hyperdense areas were identified within the optic nerve head. In contrast, the present case represents the first report of ONHD in a dog confirmed and characterised using the non-invasive SD-OCT, which enabled precise longitudinal monitoring of structural changes not achievable with previously available imaging methods.

Limitations

The focal hyperreflective material within the optic nerve head on OCT, together with the echogenic appearance of the lesion on ocular ultrasonography, was consistent with ONHD. However, although the presence of this material was evident on imaging, histopathological examination would be required to definitively characterise its composition and determine whether it represented mineralised drusen, another type of intrapapillary deposit, or a sequela of previous optic nerve pathology.

Conclusion

The peripapillary retinal thinning coexisting with optic nerve head drusen (ONHD) and peripapillary hyperreflective ovoid mass-like structures (PHOMS) underscores the similarity of pathological changes observed in this dog to those described in humans. This case represents the first canine report in which ONHD was primarily detected and comprehensively characterised using spectral-domain optical coherence tomography (SD-OCT).

The modality enabled precise, non-invasive qualitative and quantitative assessment of ONHD and associated retinal alterations, facilitated differentiation of ONHD from true optic disc oedema and other optic neuropathies, and allowed detailed longitudinal monitoring of structural and morphometric retinal changes over time. These findings highlight SD-OCT as a valuable diagnostic and monitoring tool in veterinary ophthalmology, particularly in cases of unexplained optic disc elevation.

Abbreviations

ONHD	Optic nerve head drusen
SD-OCT	Spectral-domain optical coherence tomography
ERG	Electroretinography
USG	Ultrasonography
MRI	Magnetic resonance imaging
PHOMS	Peripapillary hyperreflective ovoid mass-like structures
ILM	Internal limiting membrane
NFL	Nerve fibre layer
GCL	Ganglion cell layer
IPL	Inner plexiform layer
INL	Inner nuclear layer
OPL	Outer plexiform layer
ONL	Outer nuclear layer
ELM	External limiting membrane
MZ	Myoid zone
EZ	Ellipsoid zone
OPRS	Outer photoreceptor segment
IZ	Interdigitation zone
OR	Outer retina
TRT	Total retinal thickness
RPE–BmCc	Pigment epithelium–Bruch's membrane–choriocapillaris complex
PLRs	Pupillary light reflexes

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Yarns – Part 4 of 10

by Jay Malherbe

The lonely heifer

An absentee farmer from Durban had a large remote farm near Impendie, down in the Umkomaas valley. A call came in that a heifer was having trouble calving and needed help. Off I went, and upon arrival on the farm, I found it deserted. There didn't seem to be a soul around. I eventually found a young maid, probably a teenager, in the kitchen. Upon enquiry as to where everyone was, she pointed to the hills where there was a lot of smoke from a veld fire. Everyone had rushed off to fight the fire, I was told.

She led me to a small Jersey heifer in a shed. Many farmers, although farming beef, tend to keep a few dairy cows around for milk for the house and staff. Donning my overalls, I was able to manipulate the calf into the correct position for delivery, but I needed some extra pulling power to get the calf out. We did have a calf extractor at the clinic, but we tended not to carry it with us, as usually there is plenty of labour on the farms to help pull calves. Also, in inexperienced hands, a calf puller can be a bit severe.

Back to the kitchen, I told the young lady that I needed her help. In the shed, she took one look at the bit of bloody fluid on my overalls and the state of the shed floor; she then proceeded to unbutton and remove her little pink maid's dress.

So there we were side in the hay, her clad only in a pair of panties, pulling the calf out! This wasn't too difficult, and we soon had a live calf. All the while I had to try and not look too closely at her fine young form.

Halfway through, I couldn't help but laugh at what the S A Police would have made of this if they had pitched up. This was, of course, back at the height of the apartheid era.

Anyway, a short while later, all washed up and dressed in her pink uniform, the tombazaan waved me a cheerful goodbye from the kitchen door.







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- To further the status and image of the veterinarian and to foster and enrich veterinary science
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Congratulations to Prof Johan Schoeman!

The University of Pretoria announced the appointment of Prof Johan Schoeman as Dean of the Faculty of Veterinary Science from 1 November 2026 for a term of 4 years.

The SAVA Board of Directors and all the Vethouse personnel congratulate you on your election as Dean and wish you a successful future in this very important role.

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South African Veterinary Association
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Notice is hereby given that the 121st Annual General Meeting (AGM) of the South African Veterinary Association

will be held on Saturday, 05 December 2026, 08:00 at VetHouse and virtually via Zoom.

Please notify Ms Sonja van Rooyen whether you will be attending in-person or virtually.
Tel: 012 346 1150 / Email: assistant@sava.co.za

Meeting documents and Zoom link will be circulated closer to the meeting date.

By order of the Board
Registered office:
47 Gemsbok Ave, Monument Park, 0181

September 2026

Dear SAVA member

Please note that Vethouse will be closed from 12:00pm on Wednesday 23 December 2026 and will reopen on Monday, 04 January 2027.

SAVA wishes all its members and their families a joyful festive season and all the very best for the year ahead.

Kind regards
Sonja Ludik
Interim General Manager

Geagte SAVV lid

Neem asseblief kennis dat Vethuis gesluit sal wees vanaf 12:00pm op Woensdag 23 Desember 2026 en weer op Maandag, 04 Januarie 2027, sal heropen.

SAVA wens al sy lede en hul gesinne 'n vreugdevolle feestyd toe en alle voorspoed en geluk vir die jaar wat voorlê.

Vriendelike groete
Sonja Ludik
Waarnemende Algemene Bestuurder

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VACCINATION BOOKS

The LAST ORDERS for 2026 for vaccination books will be on 30 November.

No orders will be accepted after this – this is to ensure that stock will be dispatched by 15 December 2026.

Orders for 2027 will resume on 18 January.

To order / for more information contact Debbie Breeze on 012 346 1150 or debbie@sava.co.za


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In Memoriam

John Gwyn (Dick) Whittington-Jones
1943 – 2026



John [Dick] was born on 16 December 1943 and died on 2 September 2026. He qualified as a veterinarian at Onderstepoort in 1968, where he was a quiet and reserved student.

He began his career as the State Vet in Calvinia from 1969 to 1971, fulfilling his bursary requirements while navigating the hospitality and eccentricities of the Hantam Karoo as a young "engelsman". The vast Calvinia region, some 40,000 square kilometres stretching from Alexander Bay to Sutherland, was enough distance to quickly dull the novelty of keeping the government vehicle logbook up to date.

Most of his work involved metabolic and viral diseases and plant poisoning in Merino sheep and, to a lesser extent, cattle and horses.

From 1971 to 1975, he was the State Vet in Mossel Bay where, while balancing sheep production and livestock disease control, he started a family with his new wife, Anne. His next challenge came in 1976, when he established a private practice in Pinelands, Cape Town. He remained its sole vet until he retired 40 years later, in December 2016. It was here that the family grew to four sons. With the clinic attached to the family home, it quickly became clear that the select rescue cats and dogs that made it into the lounge would stay as the family pets.

While Anne kept the household and business finances in check, John was a dedicated and considerate practitioner, respected by his community for his 365-days-a-year consultations and commitment to animal care. He developed a keen interest in fracture surgery and attended several orthopaedic courses in Switzerland as he built his skills and instrument array.

He earned his private pilot's licence at 42 and flew regularly for 30 years. Ironically, he found flying a Cessna out of Cape Town International a soothing antidote to the stress of private practice. It was also easier than finding a Spur restaurant in Cape Town on a Sunday that didn't inevitably end in an impromptu client update or the "have you got a phone I can use?" request in the days before cell phones, when pagers ruled.

His understated, staunch professionalism and love of WWII Spitfires live on in his family, who will remember him fondly. He is survived by his wife, Anne; his four sons; seven grandchildren; and his brother, David. V

Maryke Henton

In Memoriam

We remember the contributions made by our colleagues who recently passed away.

Dr Nicola Toich: 1944 – 2026

Dr Zoleka Ntondini: 1971 – 2026

We honour their contribution to our profession and society in general and pray that their families and loved ones will find the strength to carry them through these times of bereavement.

Influential Life Coaching

ATOMIC HABITS – BOOK REVIEW



Dr Mats Abatzidis

B.Sc. B.V.Sc.

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Author of the published book "Life outside your comfort zone. Better and beyond all expectations".
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Greetings, everyone, and I hope winter has been kind to everyone! I would like to share my own book review that is not linked to any form of incentives or marketing. The book concerned is "Atomic Habits" by James Clear and I had the pleasure of processing the ideas and suggestions provided by the author. James Clear's perspective on goals versus systems is one of the central ideas in Atomic Habits.

The Core Idea

James Clear argues that goals set direction, but systems create progress. A goal is the result you want to achieve, while a system is the process you follow repeatedly.

Examples:

1. **Goal**: Run a marathon. **System**: Following a training plan every week.
2. **Goal:** Lose 10 kg. **System**: Preparing healthy meals, tracking nutrition, and exercising consistently.
3. **Goal**: Write a book. **System**: Writing 500 words every morning.

Clear's argument is not that goals are bad. Rather, he believes that people focus too much on goals and not enough on the systems that produce those goals.

Why Systems Matter More Than Goals

1. Winners and Losers Often Have the Same Goals

Clear points out that almost everyone wants success.

For example: Every athlete wants to win. Every business wants higher revenue. Every student wants good grades.

If the goal itself were the determining factor, everyone would succeed. **The difference lies in the systems they follow daily**. As a coach, the presence of a goal is merely a starting point but tells me very little about the person's ability to achieve it. The quality of a person's habits tells me much more about their motivation, discipline and most likely progress.

2. Achieving a Goal Is Only a Temporary Change

Many people believe: "Once I reach my goal, the problem will be solved." The author of the book calls this the "goal-first" trap.

Examples: A messy room gets cleaned once. A person loses weight for a vacation. A company solves a temporary performance issue.

The real question is: What system produced the problem in the first place?

If the underlying habits remain unchanged, the old results tend to return. This is why many people regain lost weight, return to old behaviours, and lose momentum after reaching a milestone.

The author argues, and I agree, that lasting improvement comes from changing the system, not merely achieving the objective. Actions speak louder than words.



3. Goals Restrict Happiness

James Clear believes many people postpone happiness until they achieve a goal.

Examples: "I'll be happy when I get promoted." OR "I'll be happy when I lose weight." OR "I'll be happy when my business reaches a certain revenue."

The danger is that happiness becomes conditional.

A systems-oriented mindset allows satisfaction during the journey because success is measured by showing up consistently and following the process. As a life coach, this is where I am a bit different, because I teach my clients to value the daily practice rather than waiting for a future goal by **having rewards for completing the many milestones** along the journey to success or completing the goal/task.

4. Goals Create an "Either/Or" Mentality

With goals, success can feel binary, meaning that if goals are achieved = success, but if not achieved = failure.

Systems create a more sustainable perspective. For example:

A client may not yet have achieved a 20 kg weight-loss goal, but if they are exercising regularly and eating well, they are already **succeeding at the system.** This **encourages resilience and persistence.**

"The Ice Cube Analogy"

One of James Clear's most memorable illustrations involves an ice cube in a cold room.

Imagine increasing the room temperature: 25°F -->26°F -->27°F -->28°F -->29°F -->30°F -->31°F

Nothing appears to happen.

Then at 32°F, the ice begins to melt. **The breakthrough looks sudden, but it was actually the result of many previous small changes.**

The lesson: **systems create gradual improvements** that are often invisible until a critical threshold is reached.

People frequently become discouraged because they do not see immediate results. James Clear and I would encourage you to stay committed to the process.

Identity Is Even More Important Than Goals

The book ultimately goes beyond goals and systems. James Clear argues that the deepest level of change is identity.

Instead of asking: "What goal do I want to achieve?" **Ask: "Who do I want to become?"**

Examples:

Instead of: "I want to run a marathon." Think: "I am a runner."

Instead of: "I want to write a book." Think: "I am a writer."

The system then becomes evidence supporting that identity. Every workout is a vote for being an athlete. Every writing session is a vote for being a writer. **Identity-based change tends to be more durable** than outcome-based motivation.

A useful coaching framework:

Step 1: Clarify the Goal - What outcome are you hoping to achieve?

Step 2: Identify the System - What repeated behaviours would naturally lead to that outcome?

Step 3: Focus on Process Metrics - Instead of measuring only outcomes:

- Number of workouts completed.
- Number of sales calls made.
- Number of journal entries written.
- Number of healthy meals prepared.

Step 4: Explore Identity - What kind of person consistently does these behaviours?

Then: What small action today would reinforce that identity?

Next month, we will continue looking at more ideas for improving our quality of life and overall performance both at work and at home.

Ocular disease in snakes and geckos

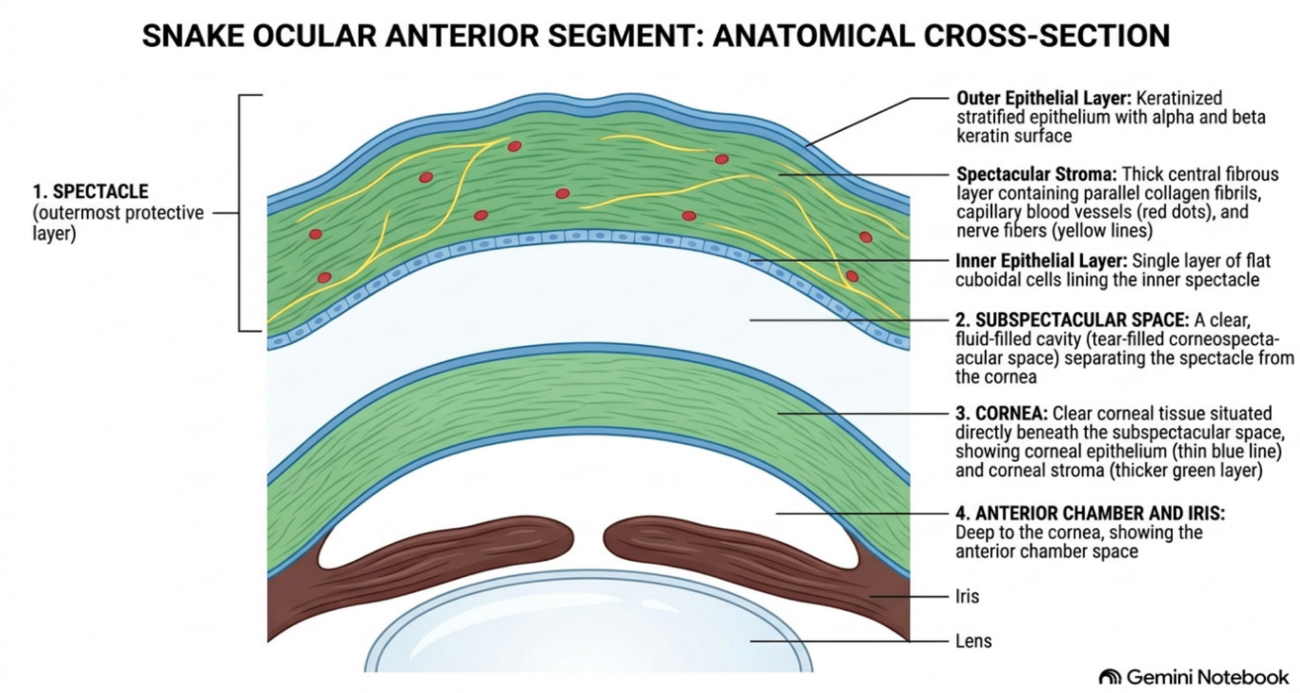
Dr Jessica Goodhead
Johannesburg and Cape Animal Eye Hospitals
www.animaleyehospital.co.za

Through evolutionary adaptation, snakes, burrowing lizards, and some geckos do not have eyelids. These reptiles instead have a specialised transparent, rigid, and non-mobile spectacle. This spectacle and sub-spectacular space are common locations for ocular disorders that may present at your clinic.

The spectacle is composed of three layers. The outer epithelial layer, which is made of multiple rigid keratin layers, provides protection and optical transparency. This keratin layer is cyclically shed, which is a normal biological process for these reptiles, otherwise known as ecdysis. During ecdysis, the lacrimal fluid separates the old spectacle from the newly synthesised layer. The spectacle is usually shed in a single complete piece, together with the rest of the skin from the reptile's head. A temporary blue-grey opacification of the spectacle is a key examination finding during this process, which then regains its transparency immediately before shedding.

The middle stromal layer of the spectacle consists of layered collagen, which is typically vascularised. The last layer of the spectacle is the inner epithelial layer. This is a single layer of cuboidal cells with secretory vesicles and microvilli, which represent the continuation of the palpebral conjunctiva.

Between the spectacle and the cornea is the sub-spectacular space. Clear, tear-like fluid fills this space, mostly originating from the Harderian gland. A single punctum drains the fluid into the ventromedial fornix, and later into the lacrimal duct. Due to the close anatomical positioning of the spectacle, the sub-spectacular space, and the globe, ocular conditions can easily spread, affecting all these adjacent structures.



Common ocular and spectacle disorders

1. Spectacular Dysecdysis (Retained Spectacles)

Spectacular dysecdysis, which is when the outer epithelial layer fails to shed, is the most common condition seen in snakes kept in captivity. Although this can occur in healthy reptiles, it has commonly been noted with poor husbandry, specifically low humidity or lack of abrasive substrates to initiate shedding. Dehydration, malnutrition, ectoparasites (mostly mites) or systemic disease can also contribute to spectacular dysecdysis. The vision of these reptiles is compromised by an accumulation of dry, wrinkled, opaque layers of unshed tissue over one or both eyes. Medical and conservative treatment should include lukewarm water baths of the spectacles, in combination

with applying topical tear preparations or saline. Improving the humidity and husbandry are key aspects of treatment. Once softened, the spectacle can be gently rolled back using a cotton bud; however, aggressive peeling of the retained spectacle must be avoided as the stroma and inner epithelial layer can be easily damaged. Damage to these structures will predispose the patient to corneal ulcers, keratitis or permanent blindness.



2. Spectaculitis

Spectaculitis is a localised active inflammation of the outer two layers of the spectacle. It may present as opaque oedematous spectacles, with or without crust formations extending from the skin. Spectaculitis is often found in conjunction with the dermatitis since the spectacle is modified skin. Other causes may include secondary bacterial (namely Gram-negative rods) or fungal infections after microtrauma to the spectacle, poor husbandry, or nutritional abnormalities. In most cases, the lesions resolve once the dermatitis or infection is under control.

It is important to remember that the impermeable keratin barrier of the spectacle means topical medications have limited value because they are unable to penetrate to the sub-spectacular space and into the globe. Treatment for these common conditions of the sub-spectacular space and cornea can be achieved either with systemic medication or surgical intervention.

3. Pseudobuphthalmos (Bullous Spectaculopathy)

Partial or complete obstruction of the lacrimal drainage system results in an accumulation of lacrimal fluid in the sub-spectacular space. The fluid build-up distends the spectacle, making the eye appear buphthalmic with a blue-white opacity. The obstruction is commonly secondary to stomatitis, oral debris, periorbital granulomas or trauma. In acute cases, percutaneous aspiration of the sterile fluid can provide temporary relief. These patients can be treated by correcting the underlying cause; however, chronic cases may require creating a new drainage path via conjunctivoralostomy.



4. Sub-spectacular Abscess

A sub-spectacular infection or abscess is characterised by an accumulation of thick white-yellow exudate within the sub-spectacular space. Chronically, this condition causes inflammatory changes. The spectacle can become friable and may spontaneously rupture. Ascending oral infection, usually *Clostridium perfringens* or *Pseudomonas spp.*, is the primary cause of infection when these pathogens enter the sub-spectacular space via the lacrimal duct. Systemic sepsis, URT infections or penetrating trauma can also be the causes of abscessation. Treatment of this condition requires general anaesthesia to perform a partial spectaculectomy, debridement, and flush to remove the caseous material, along with systemic antibiotic treatment.

Take home messages:

- Spectacle and sub-spectacular disorders, although common, can be easily treated and avoided with good husbandry and biosecurity.
- When treating these conditions, particular care must be taken with the spectacle to avoid damage to the underlying structures.

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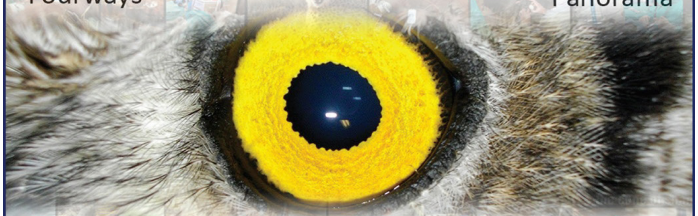
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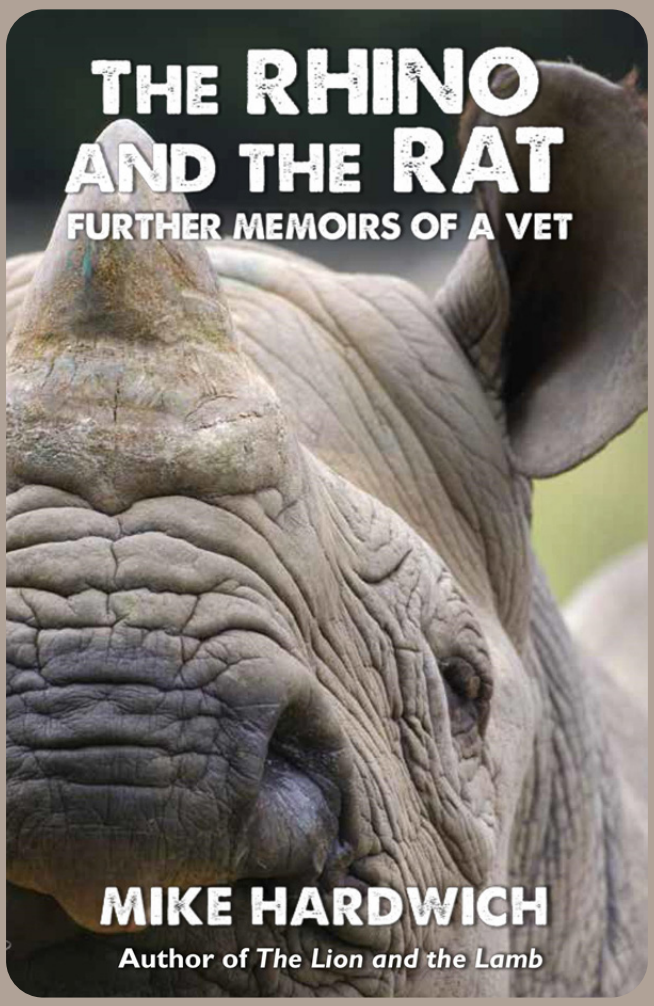
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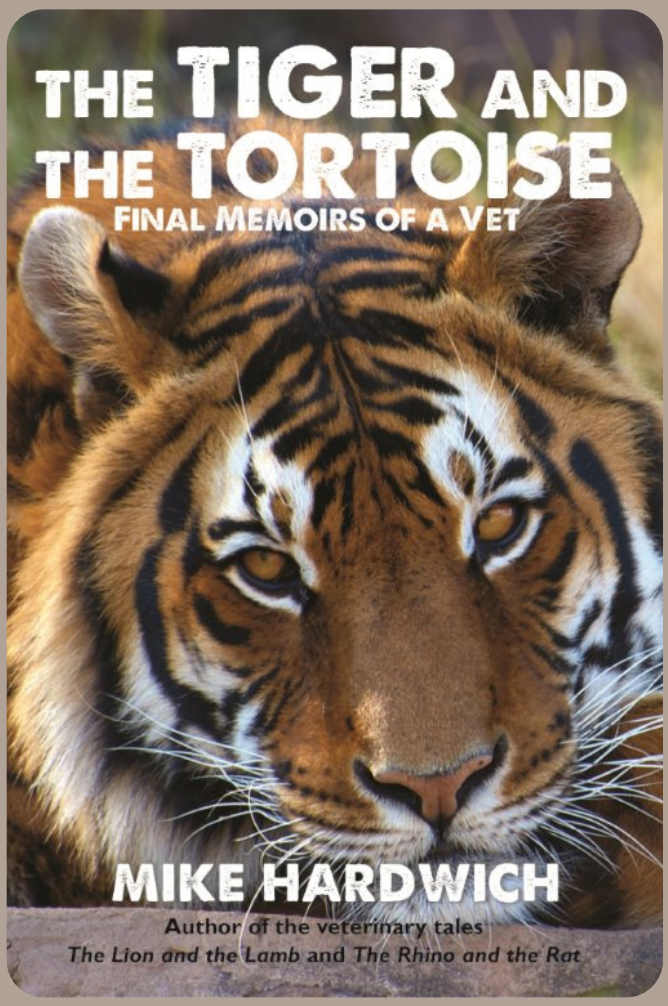
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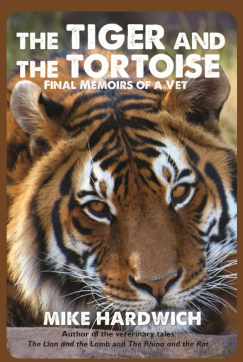




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