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November 2026

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



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STREET ADDRESS
47 Gemsbok Ave, Monument Park, Pretoria, 0181, South Africa

POSTAL ADDRESS
P O Box 25033, Monument Park
Pretoria, 0105, South Africa

TELEPHONE
+27 (0)12 346 1150

WEB
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Sonja van Rooyen
assistant@sava.co.za
+27 (0)12 346 1150

DISPLAY ADVERTISEMENTS
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+27 (0)12 346 1150

DESIGN AND LAYOUT
Sonja van Rooyen

President: Dr Ziyanda Majokweni-Qwalela	president@sava.co.za
Interim General Manager: Ms Sonja Ludik	sonja@sava.co.za/ +27 (0)12 346 1150
Editor VetNews: Ms Andriette van der Merwe	vetnews@sava.co.za
Accounts / Bookkeeping: Ms Debbie de Beer	accounts@sava.co.za/+27 (0)12 346 1150
Marketing & Communications: Ms Sonja van Rooyen	marketing@sava.co.za/ +27 (0)12 346 1150
Membership / General Enquiries: Ms Debbie Breeze	debbie@sava.co.za/ +27 (0)12 346 1150
Vaccination Booklets: Ms Debbie Breeze	debbie@sava.co.za/ +27 (0)12 346 1150
South African Veterinary Foundation: Ms Debbie Breeze	savf@sava.co.za/ +27 (0)12 346 1150
Community Veterinary Clinics: Ms Claudia Cloete	manager@savacvc.co.za/ +27 (0)63 110 7559
SAVETCON: Ms Corné Engelbrecht	corne@savetcon.co.za/ +27 (0)71 587 2950

Caring for Our Colleagues, Strengthening Our Profession: Putting Health and Wellbeing First



Dear members,

November brings an important focus on men's health, while World Diabetes Day, will be observed on 14 November, reminds us of the importance of awareness, early detection and appropriate management of chronic health conditions. These observances provide a timely opportunity to reflect on the health and wellbeing of veterinarians and the responsibilities we share in caring for ourselves and one another.

Veterinary professionals are often deeply committed to the welfare of animals, the needs of their clients and the communities they serve. Yet, while meeting these responsibilities, our own physical and mental health can easily become a secondary consideration. Long working hours, demanding professional responsibilities, financial pressures, emotional fatigue and the challenges of maintaining a healthy work-life balance can all take their toll.

Over recent months, SAVA has received several appeals for financial assistance towards the medical expenses of colleagues facing serious health challenges. We have also become aware of veterinarians experiencing significant personal and emotional distress. These reports are sobering reminders that behind every professional title is a person who may be navigating challenges that are not immediately visible to colleagues or clients.

Some of the colleagues for whom assistance has been requested have served our profession with distinction over many years. Their circumstances remind us that professional accomplishment and years of dedicated service do not shield anyone from illness, financial vulnerability or personal hardship.

I encourage members who can assist to respond generously to the appeals for support being circulated. Every contribution, however modest, is an expression of solidarity and appreciation for colleagues who have given so much to the profession.

Beyond financial assistance, we must also cultivate a professional culture in which seeking help is regarded as a responsible and positive step rather than a sign of weakness. We should feel comfortable speaking openly about physical and mental health, encourage colleagues to access professional support when needed and remain attentive to signs that someone may be struggling.

The focus on men's health is particularly relevant because societal expectations of resilience and self-reliance can sometimes discourage men from discussing health concerns or seeking assistance early. Similarly, diabetes reminds us of the importance of preventative healthcare, regular screening and the ongoing management of chronic conditions.

A profession that champions animal welfare must be equally committed to the wellbeing of its own members. We cannot sustainably care for others if we neglect the health and wellbeing of those providing that care.

As an Association, our responsibility extends beyond professional representation and advocacy. It includes promoting a culture of compassion, collegiality and practical support, where no colleague should feel that they must face serious personal challenges in isolation.

Strengthening SAVA's Governance and Sustainability

The past month has also been one of preparation, reflection and responding to the evolving needs of our profession. As we approach the end of the year, the South African Veterinary Association (SAVA) continues to focus on strengthening its governance, advancing professional advocacy and addressing the challenges facing our members.

The review of SAVA's Memorandum of Incorporation (MoI) remains an important priority for the Board of Directors.

Considerable work is underway to ensure that the revised document provides an appropriate governance framework that responds to the Association's current and future needs.

Given the extent of the proposed amendments and the importance of allowing members sufficient time to consider these changes, the revised MoI will not be ready for consideration at the Annual General Meeting scheduled for 5 December 2026.

Instead, the Board intends to present a working draft to members for review and engagement, following which a Special General Meeting (SGM) will be convened to consider the proposed amendments.

Financial sustainability remains another pressing concern. Membership subscriptions are fundamental to SAVA's ability to fulfil its mandate, advocate effectively for the profession and sustain the programmes and services that benefit our members. I therefore encourage all members to remain in good standing and to encourage colleagues to maintain their membership. A strong and sustainable Association requires the collective commitment and participation of the profession it represents.

Our advocacy work continues on several important fronts. Following our engagement with the South African Health Products Regulatory Authority (SAHPRA), SAVA is finalising the Terms of Reference for the proposed joint technical working group on veterinary pharmaceuticals. This engagement represents an important opportunity to strengthen dialogue with the regulator and address regulatory challenges affecting the availability and appropriate use of veterinary medicines.

Antimicrobial resistance (AMR) also remains a critical priority for veterinary and public health. The South African Antimicrobial Resistance National Strategy Framework (2017–2024), which served as the country's National Action Plan, has reached the end of its implementation period. Work is now progressing towards the development of the National Action Plan on Antimicrobial Resistance for 2027–2030.

As part of this process, the National Department of Agriculture's Veterinary Public Health Directorate has invited stakeholders to participate in an animal-sector consultation workshop scheduled for 11 November 2026 at ARC-Onderstepoort Veterinary Research, Pretoria.

This consultation presents an important opportunity for the veterinary profession to contribute to the development of a coordinated and practical response to antimicrobial resistance. It is essential that the animal health sector's responsibilities, challenges and contributions are adequately reflected in the new plan, particularly in relation to antimicrobial stewardship, surveillance, diagnostics, veterinary medicine availability and the implementation of the One Health approach.

SAVA remains committed to contributing to this process and advocating for measures that are scientifically sound, practical and responsive to the realities of veterinary practice.

We also continue to engage on the management and control of Foot and Mouth Disease (FMD), particularly as it relates to wildlife and game species. Further guidance on appropriate control and management protocols is awaited. We recognise the importance of regulatory clarity for veterinarians working with wildlife, game ranchers and conservation stakeholders, especially where disease control measures have significant animal health, conservation and economic implications.

As we enter the final months of 2026, the work before us remains considerable. Finalising the SAHPRA Technical Working Group's Terms of Reference, progressing the review of our MoI, contributing to the national antimicrobial resistance agenda and advancing our advocacy on important animal health matters will continue to demand our attention and collective effort.

However, I would like us to remember that the sustainability of our profession cannot be measured solely by regulatory achievements, organisational structures or financial performance. It must also be measured by how we support one another, particularly during times of vulnerability.

I encourage each of us to take time to attend to our own health, check in on a colleague, offer support where possible and remain actively involved in the Association that represents us.

As we work towards a stronger and more sustainable SAVA, may we never lose sight of the compassion, service and collegiality that define the very best of our profession.

Our strength as a profession lies not only in what we achieve together, but also in how we care for one another along the way.

Groetnis!
Dr. Ziyanda Majokweni – Qwalela
President: South African Veterinary Association

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Challenges and blessings

Editor's notes / Redakteurs notas

The August edition of Vetnews is traditionally dedicated to the women in our industry. Being a woman, it comes naturally to always want to protect my 'sisters'. It is fairly easy to gather content on the subject if you are in the realm of reference. What is slightly more difficult is stepping out of the comfort zone. A letter from my favourite Dr G (who does not just let an issue he feels is important slip by) did just that. I took up his challenge and looked at the challenges the male veterinarian faces. You can read about some of the issues I drew from an AI-generated article. Please do not crucify me for the use of this tool for data gathering.

Touching on the point of using artificial intelligence, it is a very sensitive issue, but it has become part of our lives (or mine at least). It may be as simple as googling a dose to submitting your X-rays to a site for evaluation. It is much quicker than trying to go back to class notes. You do not necessarily have to use engines like Claude or ChatGPT to get your answer. I think the crux of using AI is not to shift the responsibility to a third party. It is still mine and your responsibility for what we do with the information rendered.

This month, diabetes and men's health are the focus. In our industry, it is very easy to fall into bad eating habits due to long, jam-packed hours. Take-aways are an easy escape, but the prolonged use will eventually end up getting you in hot water with your health. I want to stress to everybody the importance of doing their regular health checks- yes, those tests we shy away from because they are uncomfortable or even a little embarrassing. Cancers and other health conditions have a better outcome if detected early – long before symptoms may show. Give yourself the best chance of the best outcome: GET TESTED.

Please find an endearing letter from Dr Tod Collins later in the magazine.

Let me get back to the topic of challenges and blessings. A lot has been said by very famous people about hard work:

- **"There is no substitute for hard work." — Thomas A. Edison**
- **"Without labour, nothing prospers." — Sophocles**
- **"Work hard at work worth doing." — Theodore Roosevelt**
- **"Nothing ever comes to one that is worth having except as a result of hard work." — Booker T. Washington**

I think every single person reading this will attest to having to work hard to gain or achieve anything. I have worked very hard on a project for nearly 10 years. It has brought me such joy over the years and stretched my capabilities, energy, planning, and budget stretching to the limit. And all of a sudden, things start to come together. I stand back, and things are just happening. It seems like the baby I raised is starting to become more independent. In a way, it is sad, but also very satisfying. Yes, blessings come after hard work.

If you are struggling to see the light, know that your blessings and results will follow. I picked up these 2 verses from the Bible to encourage you in the last stretch of this year.

Colossians 3:23–24: "Whatever you do, work at it with all your heart, as working for the Lord, not for human masters, since you know that you will receive an inheritance from the Lord as a reward."

Proverbs 14:23: "All hard work brings a profit, but mere talk leads only to poverty."

May it carry you.

Andriette

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The Silent Minority: Challenges Facing Male Veterinarians Around the World

Veterinary medicine has become one of the most feminised professions in the developed world, and the change happened quickly. Women have outnumbered men among veterinary students for decades in many countries, and in some schools the gap is now very wide. That shift has brought real benefits, but it has also changed the experience of the men who remain in the profession, and it has raised questions about how the profession understands its own health, workload and future.

This article examines six areas: enrollment trends, suicide risk, gender-linked diseases in animals, conditions more common in men generally, family responsibility, and retirement. It draws on the most recent data I could find and notes where the evidence is thin.

Enrollment: a profession that has tipped

Men have been a minority in veterinary schools for some time. A CDC analysis of veterinarian deaths notes that women began outnumbering men among veterinary students in the late 1980s, and the trend has continued since then.[1]

Recent school-level data show how lopsided intake can be. At Iowa State University's College of Veterinary Medicine, the entering class of 2025 was 18.2% male, with 29 men and 130 women among 159 new admits.[2] New Zealand figures for 2024 show a similar pattern. Domestic students enrolled in veterinary studies there numbered roughly 2,720 women and 295 men, so men made up under one in ten.[3]

These are single-institution and single-country snapshots, not a global census, and national data are not consistently published in many countries. Still, the direction is consistent across the sources reviewed: most new veterinarians in high-income countries are now women. Men entering the profession increasingly join a workforce whose culture and networks look different from the one their predecessors knew.

Suicide risk: a serious and gendered concern

Suicide is the most serious health issue in this discussion. The most detailed US work comes from the CDC's National Institute for Occupational Safety and Health (NIOSH). Its study of deaths from 1979 through 2015 found 398 suicides among veterinarians, of whom 326 (82%) were male and 72 (18%) were female, and most decedents were 65 or older. Both male and female veterinarians had suicide mortality ratios above those of the general population.[4]

The headline comparison, published in 2018, reported that female veterinarians were 3.5 times as likely, and male veterinarians 2.1 times as likely, to die by suicide as the general population.[5] The proportion of women among veterinarians who died by suicide stayed at about 10% from 2000 onward, though the number of deaths rose with the growing female workforce.[6]

A later NIOSH reanalysis using stronger statistical methods put the figures at 1.6 times for male veterinarians and 2.4 times for female veterinarians. It also found that when deaths from pentobarbital poisoning were excluded, the risk was no longer statistically different from the general population.[7] The pentobarbital finding points to a practical concern: access to euthanasia drugs. Limiting that access in clinics is one of the few prevention measures the research directly supports.

Men account for most suicide deaths in the profession, partly because they were historically the larger share of the workforce. Women's relative risk is higher, and women report more depression and suicidal ideation in some surveys. Men may be less likely to disclose distress, and norms of self-reliance can delay help-seeking. Prevention works best when it addresses the whole profession rather than treating the issue as a women's or a men's problem. If you or someone you know is struggling, support is available. In the United States, 988 provides free, confidential crisis support, and most countries have equivalent helplines.

Conditions more common in men

Many diseases in people also differ by gender. Men carry a higher risk for several conditions, and understanding them helps place male veterinarians' health in context.

Cardiovascular disease tends to appear earlier in men than in women, and cardiovascular and cancer risk are both discussed in gender-difference reviews as areas where men have higher burden at younger ages.[12] A widely cited review notes that men face elevated risk and mortality from many cancers, while women have higher susceptibility to thyroid disease and autoimmune conditions.[13]

Neurological and neurodevelopmental conditions show clear male predominance. Parkinson's disease and amyotrophic lateral sclerosis are more common in men, and schizophrenia, autism spectrum disorder and attention deficit hyperactivity disorder are all more prevalent in males, according to a review of psychiatric gender differences.[14][15]

Some other conditions favour men. Severe psoriasis is more common in men, and gastroesophageal reflux disease is more prevalent among men than women.[16] Gout, which is linked to higher uric acid levels in men, is also more common in men, particularly before menopause, though I did not verify current figures for this article.

Respiratory patterns have changed. A 2025 review notes that certain respiratory conditions were historically more prevalent in men, but trends have shifted, so gender differences in lung disease are no longer one-directional.[17]

For male veterinarians, these patterns are relevant but not directly measured in the profession. Veterinary-specific cardiovascular and mental health surveys are needed before drawing firm conclusions about occupational risk by gender.

Family responsibility

Family responsibility is the area with the thinnest evidence, and most research has focused on women. The UK Royal College of Veterinary Surgeons (RCVS) 2006 Survey of the Profession, with about 45% female respondents, found that although some male vets take career breaks, mostly women do, and that full-time work was the norm for both genderes.[18]

This pattern shapes men's experience in ways rarely studied. Family-friendly policies such as part-time roles, flexible rostering and parental leave are often designed around mothers. Fathers who want the same arrangements may face informal judgment about commitment, and in lean practices, colleagues absorb the cover. Pay also matters. A 2018 European survey found that women were paid on average 12% less than men, down from 28% in 2015.[19] That gap influences who feels obliged to be the primary earner in a household, and so who feels able to step back.

What the research has not answered well is how male veterinarians experience caregiving, as fathers, as carers for ageing parents, or as partners of working spouses. That gap deserves attention.

Retirement: an ageing profession with a gendered workforce

Retirement decisions depend on age structure, and the veterinary workforce has a notable profile. A 2024 study of US practitioners surveyed through the Veterinary Information Network reported that in 2022 the average age of male veterinarians in practice was 50.5, compared with 41.3 for female veterinarians.[20]

Men in practice are on average about a decade older, which means they are closer to retirement and hold a disproportionate share of senior and owner roles.

The same study found that concerns about retirement were common, and that a substantial share of respondents lacked adequate retirement information.[20] A 2018 European survey found that most veterinarians planned to retire between 65 and 69, and about 20% planned to work beyond 70.[19]

Retirement is also a health question. A Norwegian nationwide survey of 198 retired veterinarians, 73% of them male, found that retirees reported fewer mental health difficulties than veterinarians still working.[21] For men, who make up most of the retiring cohort, retirement may bring relief from strain, though leaving a professional identity can still be hard.

The data do not show a mass exodus. An AVMA summary of Merck Animal Health wellbeing research found that fewer than 2.5% of practising veterinarians under 55 were very likely to leave the profession within two years. That share rises to 15% for those 65 and over, where retirement is the most likely reason for leaving.[22]

>>>10

Bringing the pieces together

Male veterinarians work in a profession that has changed faster than its structures. Men are a shrinking share of new entrants and are older on average in practice. They are overrepresented among suicide deaths, although women's relative risk is higher. They face an emergency workload shaped by male-predominant animal diseases, and family policy has largely been designed around women. Their retirement is shaped by an ageing workforce the profession is only beginning to study.

None of this makes men the profession's most disadvantaged group. Women continue to face pay gaps, harassment and limited advancement. The most useful framing is that the profession's wellbeing problems, including burnout, suicide risk and inflexible working, are shared, and that solutions which account for gender will serve everyone better than those built on stereotypes about either group.

The research gaps are clear. Good international enrollment data are sparse outside the US, UK, Europe and New Zealand. Few studies examine male veterinarians' family lives directly. Cardiovascular and other gender-linked health conditions have not been measured systematically in veterinary workers. And the link between male-predominant animal diseases and gendered workload has not been studied directly.

Note on sources: the figures above come from the references below. Several are single-school, single-country or small studies. Check the original publications before citing specific numbers, particularly for current enrollment. V

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Men and type 2 diabetes: How everyday knowledge remains unshared in gendered medical encounters



Louise Søgaard Hansen, Anne-Louise Bjerregaard, Peter Bindslev Iversen, Nicole Thualagant

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ABSTRACT

Purpose

Managing everyday life with type 2 diabetes can be challenging. In particular, men considered vulnerable are often portrayed as lacking self-management. This paper challenges this assumption by highlighting the unheeded knowledge and self-care practices these men develop, and by exploring how these are included in healthcare encounters at an outpatient clinic in Denmark.

Methods

Data were collected through observations of clinical practice and subsequent interviews with 12 men who have type 2 diabetes. A thematic analysis was conducted to explore their daily experiences of managing chronic illness and their encounters with healthcare professionals.

Results

Men considered vulnerable manifest important knowledge and strategies in managing type 2 diabetes in their daily lives, often perceiving the illness as barely present. Their encounters with healthcare professionals, particularly females, often draw on repertoires from previous experiences with (often female) care professionals and seem to follow a certain script for (female) carers encountering disadvantaged (male) care recipients. These dynamics frequently overlook the men's lived experiences and self-management knowledge.

Conclusion

Men considered vulnerable develop important coping strategies and knowledge for managing type 2 diabetes in their everyday lives. However, their encounters with health professionals often perpetuate gendered assumptions and exclude their everyday experiences and knowledge.

Introduction

Managing type 2 diabetes (T2D) in everyday life is difficult for many people.

Research has pointed out how T2D is challenging for socially disadvantaged citizens and those with multiple diseases (Martin & Topholm, 2020). Sociodemographic factors such as age, educational level, financial situation, civil status and degree of employment are known to be significant for health status (White et al., 2011). Vulnerable positions for people with T2D are likely to occur when one or more of these factors are negative (Martin & Topholm, 2020), and it has been demonstrated that people in vulnerable positions often lack the resources to handle the effects of T2D, as other worries such as poverty, physical or mental illness, lack of social support, and inadequate housing overshadow the challenges of living with T2D (Nielsen et al., 2018).

Research reveals that men have a particularly high risk of developing chronic diseases such as T2D (Carstensen et al., 2020) and that men with little education and low income who live alone are particularly vulnerable to the development of disease (Holm et al., 2018; Jensen et al., 2017). Moreover, evidence suggests that inequalities between men's and women's health are on the rise, including for T2D (Carstensen, 2022; Carstensen et al., 2020), and prevalence in men is expected to increase more than in women (Jensen et al., 2017). Compared to women, men often have fewer and more fragile social relationships, making them more vulnerable to events such as divorce, the death of a partner or other losses of close relationships (Pedersen et al., 2014; Pihl et al., 2023). A study from 2016 shows that individually tailored (medical) treatment for T2D has an apparent effect on reducing mortality in women, while men do not achieve the same beneficial effects, which the study partly attributes to social and cultural differences (Krag et al., 2016).

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These findings concur with the WHO recommendations, which call for greater attention to men when planning and executing health interventions (WHO, 2018). It has been suggested that norms of masculinity influence whether men seek medical care and whether men, in general, are concerned about their health and lifestyle (Pedersen et al., 2014). Research has emphasised that this knowledge calls for the development and implementation of specific health interventions for men (Holm et al., 2018; Jensen et al., 2017; Krag et al., 2016; Pedersen et al., 2014). However, how healthcare systems identify and integrate men's specific needs, especially those in vulnerable situations, remains an open question. Gender-sensitive healthcare interventions have been proposed to address the differences in what provides beneficial outcomes for men and women (Krag et al., 2016; Mathew et al., 2012).

This raises questions such as: "How do we know what men need, particularly those in vulnerable positions?" and "What kind of normative understandings of men and vulnerability are inherent in the problem identification constituting health encounters?"

Defying a gender-relational approach to men's health

The current body of research on men, social and gendered inequalities and chronic conditions like T2D suggests that men are more vulnerable or disadvantaged than women. This has led to a prevailing men's health discourse that emphasises men's difficulties in comparison to women. This discourse has been criticised for producing a simplistic gender-relational approach to men's health (Schofield et al., 2000) and further reproducing stereotyped preconceptions of men and their health (O'Brien et al., 2005), often leading to stigmatisation, especially for men living in poverty, perhaps with little education and other socio-economic challenges, who may be categorised as "vulnerable" in the Danish context (Martin & Topholm, 2020).

The strong focus on epidemiological facts frequently leads to the causal explanation that men, particularly men in vulnerable positions, lack self-management skills and are less adherent to treatment regimens than women. Moreover, their behaviour is seen as linked to inappropriate health choices, which, as shown, appear to be associated with norms of masculinity (Martin & Topholm, 2020). This may lead to the assumption that men who live in poverty and have little education or low-skilled jobs lack self-management and health competencies (Ahlmark & Dindler, 2017; Martin & Topholm, 2020), thus calling for healthcare services to address health behaviour associated with males (Krag et al., 2016; Mathew et al., 2012). However, if we seek to overcome the gender-relations approach to men's health, how can we explore these lives with chronic conditions in other ways? Inspired by the criticism of the simplistic gender-relations approach, this paper aims to explore men's experiences of managing everyday life with T2D and their encounters with healthcare professionals (HCPs).

A review of current research on men's experiences of T2D and their encounters with HCPs indicates a general knowledge gap about men's day-to-day management of T2D and how it is managed across healthcare sectors (Pihl et al., 2023). Furthermore, a lack of knowledge on how gendered dynamics shape the encounters has been pointed out, and this knowledge is highlighted as necessary because men are likely to encounter female HCPs (ibid.). The review by Pihl et al. 2023 points out the relevance of more ethnographic research on everyday lived experiences of handling T2D, including methodologies that will assist in producing knowledge of how gendered issues are handled in encounters with healthcare.

The study presented in this paper is part of a larger research project aiming at not only exploring actual lived experiences of everyday management of T2D and healthcare encounters but also co-creating with health professionals and male informants a future agenda for such encounters. This article, though, will only focus on the lived experiences of everyday management. Previous research has demonstrated how living with a chronic illness requires interpretational work (Synnes et al., 2020). To advance research on men's health, we approach the daily handling of T2D by following Pols' suggestion that patients' knowledge should be acknowledged as a specific form of "practical knowledge", which she also coins "knowing-in-action" (Pols, 2014). Practical knowledge is produced through everyday tinkering (Mol et al., 2010), when biomedical knowledge is translated and practised in a situated manner.

Our focus will be on what male informants tell us regarding their everyday handling of T2D in their encounters with healthcare. We thus explore how we might understand handling strategies as different from merely non-adherence or lack of health literacy and competencies. Furthermore, we examine how men's experiences, both as gendered and "vulnerable", potentially co-constitute what takes place in medical encounters.

Research design, methodology and ethical considerations

The study was conducted in an outpatient department of a Danish hospital in a rural region and consisted of interviews with 12 men receiving diabetes treatment. HCPs were asked to identify potential participants, specifically male patients they considered to be in vulnerable positions. Before doing so, we presented the aim of the study with reference to current epidemiological research highlighting some causal relationship between biological and social determinants of health, while also emphasising our critical approach to vulnerability, which does not consider male patients as vulnerable per se. We distinguished between being "vulnerable" and being in "vulnerable positions". The latter emphasises the ambition to work with vulnerability as a non-static position conditioned by structural factors and relations. The selection of informants was made by the HCPs, but also informed by current research and our theoretical approach to vulnerability.

Data collection and analytical approach

To explore the everyday life context of the informants and gain knowledge of their medical encounters, we were present in their encounters with HCPs before interviewing them.

Observations not only permitted direct contact with the patients but also provided relevant knowledge about the context and content of the medical encounter. Moreover, the observations formed a basis for the interview. The content of the interviews was partly theoretically informed and partly driven by the researcher's observation of the men's encounters with HCPs.

Methodologically, the observations and semi-structured interviews were conducted using a constructivist and interactionist methodology (Højgaard, 2010; Staunæs & Søndergaard, 2005). This approach regards the interview situation as a conversation, a mutual process, and emphasises that it is to be understood as complex. Interviews should aim to create an exploratory conversation in which interviewees can unfold their experiences and "reality". To help the informants feel confident with the interview situation, we invited them to take part in alternatives to traditional face-to-face interviews, e.g., to walk with us during the interview or to sit in less informal places, such as on a bench outside the hospital or in a canteen over a cup of coffee. These mundane situations led to conversations on small everyday matters and enabled more detailed questions on their management of T2D and their medical encounters.

The interviews were audio-recorded and transcribed verbatim by a research assistant. To secure the quality of the transcriptions, they were read by the first and last author while listening to the audio files. Subsequently, data were analysed following the thematic analysis approach (Terry et al., 2017), which is described as generic and adaptable to different ontological and epistemological bases. Themes are considered an outcome of the analytical process rather than the starting point. Coding and eliciting themes are subjective and interpretative processes. These are constructed between the researchers, the empirical data, theoretical and conceptual frameworks, knowledge, research skills and experience. The initial process is coined "inductive coding" (ibid.), leading to latent or interpretative codes.

The coding was performed by the first and last author independently, followed by a collaborative process where all codes were scrutinised for relevance to the research questions. Following this process, all four authors met for an analysis workshop where codes were validated and contextualised by returning to the original data, and then discussed in relation to the theoretical framework. An example of this stage, which is described as a bottom-up approach where data are the starting point, is the finding "T2D as both trivial and frightening". Initial coding revealed that most of the participants talked about fear and anxiety in relation to receiving the diagnosis, e.g., "it brings fear of losing a limb" or "people actually may die of this". Alongside these utterances, there was a consistency in downplaying the seriousness of the diagnosis, and a tendency to trivialise it, e.g., I don't think about this AT ALL. I don't worry about the future, no, I live my life today, revealing an absence of risk thinking. This paradox became clear through the analytical discussions at the workshop.The total analytical procedure can be described as abductive rather than inductive (Alvesson & Sköldberg, 2018), as the subsequent processes of eliciting themes are iterative alternations between "(empirically laden) theory and (theory-laden) empirical 'facts'" (2018, p. 7).

Ethical considerations

The study was conducted in accordance with the Helsinki Declaration, registered with the Roskilde University Data Protection Office, and followed the reporting requirements for qualitative studies in health science research in Denmark (Danish National Centre for Ethics, n.d.). The participants were provided with verbal information and a written handout about the project. All signed informed consent forms.

Being researchers identifying as female, we reflected upon our preunderstandings of the informants, the presentation of our agenda as researchers and how gendered dynamics could influence our encounters with the informants. To address these considerations/concerns, we initially presented our curiosity to explore their thoughts on everyday life and their encounter with the health professionals and argued for why their experiences were valuable knowledge. Setting an agenda for the interview seemed to have a pragmatic effect on the conversation. However, we do acknowledge that our gender (and our position as scholars) might have influenced the outcome of the conversations.

Positionings and embodied moral orders

The study's research questions were developed within a poststructural framework with the objective of producing knowledge on men's experiences and their encounters with healthcare regarding their daily management of T2D. The previously mentioned criticism of the gender-relational approach to men's experiences in research oriented us towards less fixed understandings of "men" and "women" as analytical categories. In fact, our curiosity was directed towards the social dynamics and the "becoming" of a subject, e.g., a vulnerable male patient. Within a poststructural framework, language can be approached as discourses (Foucault, 2013), which are to be understood as more than just language.

Discourses are also practices that produce particular possibilities to "become" a subject through subjectification (Foucault, 1994). According to Foucault, this involves a double movement where the individual is objectified, so to speak, and then subjectified by submitting to the discourses in the discursive practice (ibid.). Thus, subjects become formative for the discursive practice and the resources of subjectification (Davies, 2006).

Positioning theory (Davies & Harré, 1990) is about how subjects are produced in and by discursive practices. This theoretical approach focuses on the reciprocity between discourse, subject, individual and society. It refers to how individuals are "located" in different ways in their conversations and how subjects subjectify themselves through negotiation by "taking up" a position or, conversely, rejecting it and establishing other possible subject positions. Within the theoretical framework, individuals position themselves through autobiographical material that sustains particular narratives and thereby provides particular subject positions.

This implies that subjectification is not only about "submitting" to the discourses but rather that individuals play an active role in determining which discourses to subjectify themselves through.

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Within this analytical framework, gender is thus not perceived as a fixed, predetermined category but is rather understood as dynamic and socially constructed, continuously produced, reproduced and negotiated through a social hierarchy in social space throughout various interactions (e.g., Aamann & Erlik, 2023; Skeggs, 1997). Social life dynamics contribute to the creation of moral orders. These moral orders, in turn, shape and are shaped by discourses. They entail positions, storylines and rights but also duties, which has inspired some scholars to stress positioning as being embodied. Davies (2003) refers to the notion of "body/landscape" to emphasise how moral orders are created through conversations but are also embodied (McVee et al., 2021)

Applying this analytic framework enables us to highlight how the interplay of these categories is co-constitutive in shaping unequal positions regarding health and thus the handling of chronic diseases such as T2D. Throughout the analysis, we aim to show how different positionings, sometimes in subtle ways, are constituted as, for example, one of gendered vulnerability or another of feminised, not-so-powerful professional.

Data analysis

Three central themes were identified in the data collection. One theme focuses on men's experiences of life with T2D, one focusing on their experiences with healthcare encounters, and finally, one showing how these experiences are significant for how encounters with HCPs develop.

The first section, "Life with Type 2 Diabetes", will focus on the men's everyday practices regarding T2D and how they discursively constitute the significance of the disease in daily life. The second section describes men's experiences of clinical encounters in outpatient clinics. The final section illustrates the possible positionings in the encounters between the HCPs and the men in this study. It highlights how the men's experiences co-constitute the encounters and how these are imbued with positionings of being gendered and/or "vulnerable", reproducing what we refer to as a script of gendered relations between female carers and "vulnerablised" male participants.

Life with type 2 diabetes

In this opening section of the analysis, we ask how the interviewed men position themselves regarding health and social life, thus exploring how they discursively subjectify themselves. In the interviews, the men reveal thoughts about their lives, such as their daily routines in work and family life, as well as practices related to living with T2D and other chronic conditions. Most position themselves as belonging to what could be categorised as the working/lower class in terms of education, finances and work situation, e.g., by revealing stories of poor educational performance. Their jobs are mostly unskilled, low-paid, and physically demanding, including day and night shift work, such as factory workers and night watchmen, painters, supermarket cashiers, lorry drivers, cooks on ships, or hot dog sellers. Accordingly, they present themselves through narratives of being easily replaceable in almost all the jobs they have occupied throughout their lives. They all live in rural areas, mainly by themselves, without a partner. They are either divorced or have never had a long-term relationship. A few live with a female partner, and two are single parents.

Type 2 diabetes as both trivial and frightening

The men often discovered their diabetic condition by chance, and T2D was often diagnosed due to blood clots. In this respect, the participants in this study confirm what previous research has shown (Nielsen et al., 2018). A discourse firmly anchored in an explanation of biological determination emerged within their explanatory framework of why and how they developed their condition. The hereditary predisposition was often presented as an explanatory factor for their diabetic condition: Well, the idea of getting type 2 diabetes is genetically around 88 to 92% because of my genetic predisposition. Because of my family history, you know? Unhealthy lifestyles, e.g., leading to overweight, were also constructed as causal factors for their condition and as inevitable, something beyond their control. These discursive constructions of reasons for their diabetic condition reveal a rather pragmatic and even fatalistic attitude towards the disease, as expressed by Svend: "I don't think about this AT ALL. I don't worry about the future, no, I live my life today. I don't know if I'm going to be around tomorrow". These discursive reasonings reproduce biomedical knowledge presented to them earlier in their medical trajectories and now embodied, but also reveal a certain distancing from the disease.

In the men's stories, T2D is constituted as not being a significant issue in their everyday lives, thus not given much attention. They attribute the absence of symptoms to successful medical management. As one participant explains: "I don't find diabetes plays a significant role in my everyday life. Probably because it is well-regulated by medication", and another man explains: "I don't worry about my diabetic condition. It's not bothering me; no, I don't worry. I feel pretty much in control, and gradually with the new medicines, I've found it a little easier to manage". The men generally view T2D as a condition that can be managed with medication rather than an illness. In some cases, this can lead to the construction of T2D as an almost non-existent phenomenon, which is a finding supported by other research in the field (Andersen & Steffen, 2013; Kristensen, 2008; Quaglia, 2020). Andersen and Steffen (2013) interviewed patients with diabetic foot ulcers and found a striking lack of disease perception and an insistence on living life as normally as possible.

Other diagnoses like cardiovascular disease, depression or anxiety are perceived as more important than diabetes. Rami, who has suffered from depression and severe anxiety since adolescence, has decided that he cannot opt out of anxiety medication, even though one of the severe side effects is weight gain, which is related to the worsening of his diabetic condition. "I'm really in a jam, but I've got to accept it because I'm NOT quitting my anxiety medication. It is life-destroying now. The anxiety." Several of the men also express anxiety about the potential danger of having a blood clot. Previous incidents of blood clots represented near-death experiences for most participants. Even though T2D is not regarded as a serious condition, it is closely linked to the risk of yet another blood clot. Although T2D is constructed as "just a trifle", getting the diagnosis was frightening, and the disease is considered dangerous and life-threatening, as one man says: I don't think it [getting T2D] has made

a huge difference. You get used to injecting the medicine, so it isn't that important. The hardest thing is the thought of having a lifelong disease. […] I really have to pay attention to it because it can kill you in the end, you know.

This indicates a paradox of how T2D is constructed as a trivial condition while also being a condition related to feelings of anxiety and fear of death. For others, this might lead to increased attention to the disease and enhanced adherence to advice and instructions provided by their HCPs, but for these men, this does not appear to be the case; thus, trivialising the condition may be a self-care strategy for handling life with a serious illness.

Developing personal knowledge and practices in dealing with the diabetic condition

Regular measuring of blood glucose, which is recommended and advised by HCPs, is not practised by many of the informants. Often, the measuring is inconvenient and arduous or not appropriate in the specific context it has to be performed in (such as during working hours or at social events), and it is described as a cumbersome task. To opt out of measuring is constructed as a result of a reflexive and deliberate act, which is also related to the perception of T2D as less important than other circumstances in their lives: [When I'm working] it's like everything else is behind me, and I just focus completely on my work, you know. That's why I don't measure during working hours," or as Lars says when he is asked if he measures his numbers, "Never. But I keep an eye on it [the disease and its symptoms]. I feel I'm pretty much in control. Instructions and advice derived from biomedical knowledge are thus constructed as less valuable than day-to-day experiences of handling the disease and, as we will show in the next section, bodily sensations. Instead, individual strategies are developed to deal with and act on symptoms, such as responding to these through informal and mundane acts such as resting, drinking water or eating something sweet.

Developing personal strategies and practices indicates reflexivity regarding the chronicity of the condition. Caring for their feet, which emerges as a prominent topic in the data, is constituted as a particularly significant task that can be related to the fear of losing a limb: I'm afraid of losing sensation in my fingers and toes. I've seen my cousin who hasn't taken care of herself at all. She is really badly off now. One of my biggest fears is to get cardiovascular disease or to have my feet amputated. Taking care of their feet is practised in different ways, e.g., by wearing particularly soft socks or by consulting a podiatrist regularly, though the latter can be challenged by their poor finances or, as one man argues about not seeing the podiatrist, "I refuse to do it because it tickles. I accidentally kicked a podiatrist in the head. I think it's DISGUSTING. I can't stand people touching my toes". Another says, *"No, it's just not me. It's not really my thing. I can't get my act together. I come home late in the afternoon, and I also have to set time aside to go to see the optometrist … ."*

Bodily sensations as indicators

In their everyday practices of caring for their diabetic condition, the men interviewed for this study talk about how they pay attention to, e.g., dizziness, feelings of anxiety, sleepiness, or abnormal sensations such as trembling or pins and needles. Having discovered their diabetic condition, they construct the symptoms and sensations from their localised and specific bodies as being of great importance to the daily handling of the disease. Often, they seem to pay more attention to this than measuring blood sugar levels. This indicates a higher confidence and trust in their bodily signals, as they are perceived as potential warnings of some of the dangerous consequences of diabetes.

The symptoms that require action vary. Bent, who has had T2D for many years, often has cognitive issues and is very aware of experiences like "*not feeling well, having trouble concentrating, feeling dazed or walking around in circles".* But unlike many other participants, Bent says that he needs to measure his blood sugar level when these symptoms occur because they might be present when the blood sugar level is low, or they might not be. This makes him feel too uncertain to adjust his medication intake without confirming his bodily symptoms with the reading on his monitor. In contrast, Kim, another informant, says, *"I can feel it in my body; if my blood sugar level is too low, then I get the 'shaking disease', and I'll have to get inside and eat something sweet".* Svend notices other symptoms: *Do you manage to measure it every day? Your blood sugar? No, I can feel it. I can feel if it's rising because then I get tired very quickly. And if it drops a lot, I start to shake.*

Dealing with discomfort or specific symptoms also relates to the construct of measuring as a troublesome and inconvenient task (as shown above). However, instead of trivialising and not paying attention, other strategies of awareness are clearly present, suggesting that this is not about non-adherence but, on the contrary, a form of "practical knowledge" (Pols, 2013, 2014).

This knowledge is developed when the men are juggling the demands of everyday life and try to "coordinate health care aims with other aims in life" (2013, p. 80), which is what we see in many instances in the data, such as Eric, who feels he is being pathologised by the high number of daily medication intakes, and seeks to minimise them: "You feel pathologised […]. *Even though it only takes a minute to take the medicine, you're reminded that you're not a normal functioning human being. […]".* He has found it very difficult to manage the different kinds of medications and has had to negotiate about following the prescriptions or not, as *"my diabetes symptoms have varied a lot. I'm extremely tired. And all these different kinds of medicine, I had some awful side effects, like nausea and terrible reflux […]."*

Bodily sensations are thus discursively constructed as essential tools for managing the disease and recognising it, e.g., tingling in the feet. Unusual tiredness is constructed as a symptom that will potentially alter actions and practices such as checking medication intake (if they forgot to take the required dose) or blood sugar level. The emphasis placed on bodily symptoms as important for managing T2D is in line with other studies in the field (Mathew et al., 2012). Moreover, the importance given to bodily sensations also reveals how the interviewed men position themselves in regard to the medical advice and knowledge provided to them. They have embodied the practices recommended by healthcare professionals but reflexively position themselves by developing and weighing up their own personal management strategies.

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Encountering healthcare professionals as a duty of the moral order

Following observations of the medical encounters between men and diabetes nurses, the subsequent interviews were based on these situations, leading to conversations not only about everyday management of T2D but also about how encounters with HCPs are experienced. In this section, therefore, we ask how the men discursively construct the conditions and content of the encounters and how they discursively constitute subject positions for the (female) HCPs.

Life situation as co-shaping the encounters

In several instances, factors such as work or finances are co-constructive in shaping the conditions for both the practical issues around the appointment and what is possible in the encounter. As we will show in the following, the informants' life situation comes to matter in varying forms in the encounter and the interviews.

Many must travel long distances to attend consultations, usually by public transport, which is scarce in the countryside, or by moped. They may have to take a day off without pay to fit the appointments into their schedule, since they are often employed on temporary contracts and cannot therefore easily fit a midday consultation into their daily schedule. Bent tells the nurse that he "had to take a holiday day today to make it to the appointment" and "can't take the bus because it runs very seldom, so I came here by moped". In the interview afterwards, he explains that he lives in a village 23 km from the hospital, and his employer at the factory does not want to give him time off to attend consultations at the hospital. Another man, Edward, explains to the nurse that he did not take one of the prescribed drugs because he did not consider it important. In the conversation with him afterwards, we reflect on medication, and he talks about how expensive this specific drug is and says: "If I had wanted it, I could have called someone and then I'd have got the prescription. The subsidy for medicine changes a bit [in the course of a year1], and in that period, I had to pay quite a lot of money. [.] It's not that—well, it's not insulin in that sense; it's something they make so you have less appetite. I don't think it's as important as insulin. But well, if it works, then I would—I would, of course, like to start it again." In the encounter with the nurse, Edward chooses not to tell her the real reason for not adhering to the recommendations but instead dismisses it as a misunderstanding, to keep silent about his financial difficulties in following the medication plan. He thus avoids positioning himself as being in a financially vulnerable position, which in this situation could be associated with the shame of not being able to live up to expectations. The risk of being morally judged has been explored by other scholars, such as Aamann, who points out how class and moral judgement shape healthcare encounters, leading to the recipients of healthcare revealing increased awareness of the risk of being morally judged (Aamann, 2017, 2020; Aamann & Erlik, 2023). Current research also underlines the importance of considering the "chronic anticipation of shame" among patients, which can potentially lead to experiences of stigma in clinical encounters (Dolezal, 2022).

The aim and content of the encounters are discursively constructed as focusing strongly on adherence, primarily by determining whether the desired actions have been followed as agreed. This implies that the conversations are often about something that should have been done but has not necessarily been done. The participants develop their own strategies for how to engage with this, i.e., which subject positions they are offered by the HCPs and into which they inscribe themselves. As Edward says, Of course, I'll try and do what she says, but at home, I'll have to make it fit and do whatever is possible when I come home.

Morten says, She [the nurse] tells me I need to take medication every day. When you're not used to things like that, it's a big adjustment to have to remember to come home every night. [.]. I'm not someone who comes home every day; I don't want to do that. I'm a bit of a free spirit… And now I must go home at noon because I have to take some medication, and I don't always get that done. [.] It completely interferes with everything I do. It really does. I try to adjust, but I don't always succeed every day. I often come home with my medication in my pocket. I don't tell anybody about that. That's not how it's supposed to be. Morten is not ready to subjectify himself through an obedient position, which will restrain him and make him use everyday practices that are alien to him. However, instead of bringing it up in the conversation with the nurse, he keeps it to himself and thereby subjectifies himself through a subject position that is less powerful in deciding what is legitimate to talk about and what is not.

Ironic distancing

Throughout most of the interviews, the men often discursively construct their phrases in an ironic style, e.g., when they talk about themselves or the HCPs. This blurs the aim of the content. Constructing sentences, phrases, formulations, or expressions through the use of irony can be a subtle way of expressing controversial and provocative ideas that oppose hegemonic discourses on, e.g., gender and gender equality (Goedecke, 2021). In this study, the participants often used irony and sarcasm when talking about their non-compliance with the advice given by healthcare providers or when referring to female HCPs. An example of this is when Morten talks about following the nurse's advice about his breakfast and therefore only eats sugar-free alternatives, but I really prefer oatmeal with seeds and the like in it—especially raisins. But, oh no! They are dangerous, those raisins! They could kill you… Another man ironically belittles himself by submitting to hegemonic norms of masculinity when he explains why he does not see the podiatrist: I don't dare. It's because I'm such a wimp.

At first, the use of irony or sarcasm can be understood as an expression of humour, but ultimately, it reproduces stereotyped understandings of gender norms and power imbalances between female care providers and their male, lower-class patients. As will be explored subsequently in our analysis, the clinical encounters are entangled with gendered stereotypes, often leading to predetermined positionings.

The script of gendered encounters in healthcare

In this final section of the analysis, we integrate the findings from the previous two analytical sections to show how gender and sometimes vulnerability are productive in co-constructing a script for encounters between these men and female HCPs. We thus ask

how experiences of everyday life and encounters with (female) HCPs are producing positionings that draw on well-known scripts of how to handle feminised authorities and "vulnerable" men, respectively.

Gendered positions in the healthcare encounter

Stories of female HCPs (e.g., nurses, dietitians and podiatrists) revolve around gendered, feminised positions, which might be constructed as powerful in relation to the patient but simultaneously as not-so-powerful in relation to their male counterparts, the medical specialists. The men associate the nurses through gendered normative notions of what women in subordinate (here in relation to male doctors) positions are: "young girls who smile and look cute", "grumpy old ladies in striped nurses' uniforms ", and "bitches in the municipality". They are sometimes also represented as professionals one does not have to take too seriously, as they are constantly being replaced and just "sit there, nodding, saying 'oh dear, oh this and that'. This contrasts with the "damn good" (male) doctors; thus, professional hierarchy and gender seem to intersect in terms of being positioned as an authority to be taken seriously. This is expressed by Svend talking about his experiences from the encounters:

She can be very busy, like once I just waited 1½ hours, and she had forgotten all about me. Today [at the appointment with the male doctor], he was also delayed, but maybe he doesn't work so fast any more. But he's a really nice bloke. [.] I think it makes a difference whether it's him or the diabetes nurse I talk to. You know, if I say something to you and you pass it on, it's not always exactly what I say to you. When she says, 'I'll have to talk to a doctor about that—I'll ask the doctor because I can't answer that.' Sometimes it might be nice to ask the doctor yourself.

When the men talked about the conversations they had with the nurses about managing their diabetic condition, the nurses were offered certain gendered, feminised positions associated with authoritative positions of care, such as mothers, teachers and social workers. In the data, this comes through in the way HCPs are discursively constructed as "care authorities", which establishes care as a gendered practice. The nurses are connoted and positioned as "teachers" or "adults" by being associated with other female authorities in similar institutional contexts that men have engaged with throughout their childhood and adult life, such as schools and other institutions. The men do so through formulations about the female HCPs such as: "They give homework", which "you'll have to try to do" even though it is "difficult to do it all and make it fit in". Female HCPs are people who "come after you so you must do as they say", and the men interviewed say that the demands made must be transformed so that "I can find the point of what she says about things.

Scripts in healthcare encounters

The encounters usually involve men answering questions, and the HCP downloading data from the men's blood sugar monitors and checking it. In terms of the content of the encounters, the interviewed men report that they would not share with the HCP much of the knowledge and practices which characterise their everyday handling of T2D. As previously highlighted, the men avoid talking about their everyday experiences but instead pretend to follow the recommendations or simply do not talk about certain things. The men interviewed (and the HCPs observed) reproduce familiar "scripts" (Gibson et al., 2020), following a pre-determined moral order that not only defines what positions can be taken but also what duties must be followed in the encounter.

Field notes from an encounter in an outpatient clinic illustrate this. Max's GP referred him to the clinic, and this was his first appointment. He is to talk to a diabetes nurse, followed by a short encounter with the medical specialist.

She's got quite a bit of information that needs to be filled in the digital record. While she measures Max (weight, height, blood sugar level, blood pressure, etc.), he talks enthusiastically about how he discovered that he suffered from diabetes a little over a year ago and that this has led to a radical change in his life; he eats differently, sleeps better, takes much more exercise and has already lost 23 kg. She doesn't seem to hear this but then asks if he has a partner and what kind of support he has at home, because she thinks he potentially would be able to handle the diabetes with lifestyle changes, not with medication, pointing out that it also comes with a significant expense. The male doctor enters and talks about the consequences and other matters regarding T2D. Max has been very quiet for some time. The doctor turns towards Max, points at his belly, and asks, "What are you going to bring to the table? You've got to contribute yourself". Max responds quietly that he'll do whatever it takes.' Afterwards, he and I walk to the cafeteria, and he is very frustrated with what had happened. 'She didn't hear a thing of what I told her about all the changes I made. What more does she want from me? I don't know what to do. It's so typical.

In this situation, power dynamics are being reproduced. The nurse does not correct the doctor when he immediately assumes that Max will have difficulty in "bringing something to the table" as he observes that Max is overweight. The nurse knows that Max has already worked hard to reduce his weight but performs her professional power by keeping it to herself. In that way, the encounter reproduces the constructs the men in this study previously experienced.

Max is also being both gendered and positioned as potentially "vulnerable" by the nurse's inquiry into his civil status, indicating that he will not be able to make the lifestyle changes on his own and will need a (female) partner to support him in that. She is also positioning him as being in a "vulnerable" economic position by assuming that he will be unable to afford the medication. In this situation, Max is following a well-known script by not responding but accepting the assumptions made, even though he later tells me about the major changes the diagnosis has led to in his life in general but also in his parenting, in his work relationships and in his relationship with his girlfriend. In return, he constructs a position for the female nurse as someone who acts as he would expect from someone in her position, "so typical".

Discussion

The men interviewed not only construct personal strategies for dealing with T2D in their everyday life, but they also construct a strategy for dealing with encounters with authoritative care persons

by acting as they may have done throughout life in similar situations: accepting the position they are being offered and following the moral order produced by the social dynamics in the encounter. This analytical point leads to a central concept generated from the empirical data, namely the term script.

The data collection illustrates how the clinical encounters follow a certain script, where pre-determined positions are offered. The script reproduces normative understandings of performing masculinity or femininity, respectively. With reference to Connell's term "configuration of practice" (1995), Robertson and Kilvington-Dowd (2019) point out that masculinity is not an essential aspect of being male, but something which is generated and performed relationally in social interactions, such as healthcare encounters. When hegemonic configurations of masculinity are present, they "act as constraints of options, including options related to health practices, available to men and to specific groups of men in particular" (Robertson & Kilvington-Dowd, 2019, p. 16).

Thereby, the reciprocal construction of feminine and masculine positions prompts risks of reproducing the stereotyped performance of normative expectations, such as men lacking self-management skills and being less adherent to treatment regimens than women. In that regard, the consequence of the script is that it does not encourage genuine collaboration but rather excludes or blurs the men's personal management strategies. One way of expanding our understanding of gendered practices in handling chronic disease could be to study these strategies as ways of performing masculinity as constructed socially and relationally. When the participants talk about everyday life with T2D, there is a tendency to trivialise the disease, and in this study, this is constructed as being related to successful medication. Quaglia (2020), who studied men's narratives of living with type 1 diabetes, found that such trivialization was connected to certain ways of performing masculinity.

This first analytical point leads to another important observation. The data from this study contradict the preconception of certain men as being "vulnerable". The findings emphasise how the participating men are strategic and reflexive and thus proactive in handling their chronic condition. Despite various (structural) challenges that may become barriers to taking care of a chronic condition, these men demonstrate different forms of handling strategies. They do not express a perception of themselves as vulnerable, and we suggest critically exploring the consequences of relating to patients as both gendered and "vulnerable". There seems initially to be some evidence to suggest that epidemiological factors such as education, gender, work and marital status are factors being "interpreted" as vulnerability.

This runs a risk of adding a further diagnosis of vulnerability to these men, not offering them other positionings than being "vulnerable". The question is whether this is a productive way to move forward, as there seem to be quite concrete, social and inequality-creating factors determining how healthcare services approach, understand and implement treatment for this group. Describing these men as vulnerable and offering these men positions as "vulnerable" also risks fostering a chronic anticipation of shame, potentially leading to stigma.

Scholars have criticised the notion of vulnerability because it fails to acknowledge agency and even political equality. Our data collection illustrates the negative aspects of approaching others with an essentialist definition of vulnerability. As e.g., Chung (2021) calls for, vulnerability regarding health disparities should not be ignored, but instead of approaching vulnerability in an essentialist manner, we should rather focus on the social conditions fostering these disparities and discuss structural health vulnerability. Moreover, as proposed by Ford et al. (2024), "vulnerability" could be used as a concept in public health to "[.] insist on relational, context-specific understandings of disease risk, its situated meanings and helpful measures [.]" (Ford et al., 2024, p. 132)

The findings in this study demonstrate how encounters between female HCPs and male patients categorised as vulnerable seem to be imbued with gendered positionings, drawing on experiences from earlier encounters with female care authorities. In a recent review of research on how to engage men in medical encounters, Seidler et al. (2024) point to the importance of HCPs' awareness of gender-sensitive communication and person-centred approaches. As research has shown that HCPs receive little training on men's particular needs in healthcare services, they suggest an increased focus on this in the development of curricula (Seidler et al., 2024). This could be a way forward in advancing healthcare encounters to encompass men's complex and personal illness management strategies.

Another way of addressing this issue may be by offering training programmes to HCPs on how to increase awareness and reflexivity of assumptions about health behaviour and self-management practices as being related to biological sex. Furthermore, it is essential to emphasise the importance of advancing a more patient-centred approach. However, our findings point to more complex explanations as to why the encounters develop as they do, as both the men and the HCPs seem to draw on familiar repertoires and thus engage in these gendered practices.

The analysis highlights the problematic aspects of understanding self-management practices as non-adherence if they are not aligned with biomedical knowledge. The findings suggest that how the men in this study manage T2D in their everyday lives draws on experiences from earlier routines and the juggling of various duties and demands, constructing what Pols coins "practical knowledge" or "knowing-in-action" (2014: 75). This knowledge relates to the "experiencing patient" (Thorgård, 2012), who builds knowledge through everyday practice, which includes the contexts and actions associated with living with one or more chronic diseases. This is seen when caring for other diseases may increase the risk of complications of T2D, as in the case of Rami, who must cope with his anxiety by taking medication that may lead to overweight.

It is also seen when caring for one's feet must be performed differently than advised, either due to financial circumstances or personal preferences. The men also build knowledge by paying attention to their bodily sensations rather than measuring their blood sugar levels, which was constructed as troublesome and would involve changing their daily routines. In line with these findings, Kjærulff et al. (2024), who explored adolescents' and young people's self-management of living with type 1 diabetes,

similarly found that self-management involves balancing different and sometimes competing perspectives in a given everyday situation. Furthermore, they found that bodily sensations, rather than measuring blood sugar levels, were important in handling the diabetic condition.

For various reasons, the reluctance to measure could be explained by not wanting to know the "real" level of blood sugar. One of the explanations which may be relevant to this study is that measuring means gathering data, which then may provide HCPs with insight into potentially inadequate self-management. In relation to the gendered script that has been demonstrated in the analysis, this seems to be in line with the men being reluctant to share their experiences and practices of handling the disease with the HCPs. If healthcare services are to be informed by and thus expand the approach to the treatment of T2D for this group of patients, responsiveness to their unique practical knowledge is necessary.

Conclusions

Contrary to the often claimed assumption, the findings suggest that men with T2D in vulnerable positions build important knowledge about managing the disease in their everyday lives. They develop a range of tangible coping strategies that emerge in juggling and balancing the practicalities and challenges of everyday life. In clinical encounters, however, these men are offered specific positions as being "vulnerable", based on their gender, but also socio-economic parameters.

The encounter follows a script where predetermined positions are offered by the (often female) HCPs and taken by the male patients. The men's strategies and everyday knowledge appear to be obscured or excluded in these scripted clinical encounters.

Therefore, the patients' self-care strategies are often invisible to the HCPs, and this knowledge then benefits the individual alone, despite its significance and potential important contribution to a much larger group of patients with similar conditions.

Biographies

Louise Søgaard Hansen, Assistant Professor, PhD. My research focuses on people's encounters with healthcare services and how involvement and participation processes are practised here. I am interested in the significance of institutionalised frameworks and health professional logics concerning the involvement of patients' experiences of handling life with illness. Furthermore, I'm exploring how people's unequal conditions affect the interaction between professionals and patients and impact how the patient is understood and understands themselves.

Anne-Louise Bjerregaard, Chief Consultant, PhD. During the last fifteen years, ALB's research has focused on how health behaviour (such as e.g. physical activity, sedentary behaviour, sleep, drinking, and smoking) are related to glucose metabolism and general health and well-being. ALB has specifically focused on evaluating the effect of health promotion initiatives. She has a strong epidemiological background and has coordinated and managed large-scale clinical and epidemiological studies, as well as performed register-based analyses on large datasets.

Currently, her research focuses on testing new co-creation methods to involve and engage local communities in a systems-oriented way of thinking. ALB has an extensive network of regional and national researchers in the area of health and disease prevention.

Peter Bindslev Iversen, Programme Director, PhD. I am a passionate and value-driven researcher and leader focusing on equal access, prevention and health service delivery, strategy and innovation. My main work and research are focused on leadership, partnerships, health economics and health service delivery.

My specialities are equal access and utilisation, organisational health literacy, vulnerable populations, health economic modelling, health policy and preventive health.



Nicole Thualagant, Sociologist with an interest in the interrelations between policy and practice. She explores how policies on health and care are developed, legitimised institutionally, and performed and negotiated in the encounters between users and professionals.

This interest has led to qualitative explorations of citizens' encounters with institutional systems, thereby birthing persons' and male patients' encounters with healthcare systems.

References available on request

Men's Cancers: Prevention, Early Detection and Treatment

***AI declaration*: AI has been used in the compilation of this article**

Why this matters

Most male-specific cancers are far easier to treat when found early, and the biggest obstacle is often that men delay getting checked. Testicular cancer is among the most curable cancers there is, prostate cancer is highly treatable when caught before it spreads, and penile cancer is rare but responds best to early treatment.

In South Africa, the Cancer Association of South Africa (CANSA) puts a man's lifetime risk of prostate cancer at about 1 in 16. Testicular cancer is much rarer, at about 1 in 1,749, but it is the most common cancer in South African men aged 20 to 35. CANSA also notes that many men avoid checks because of cultural taboos, fear of a diagnosis and myths, and that most South African men with prostate cancer arrive when it is already advanced.

This article covers the three cancers of the male reproductive system (testicular, penile and prostate), plus male breast cancer, which many men do not know exists. For each, it sets out what raises risk, what you can do to prevent it, the warning signs, how it is diagnosed and how it is treated.

This is general information, not medical advice. Any new lump, swelling, sore, pain or change should be checked by a doctor or clinic.

Testicular cancer

Testicular cancer is highly curable: about 95% of men survive five years overall, and about 99% when it is found while still confined to the testicle. It mostly affects young and middle-aged men, which is why awareness among men in their teens, twenties and thirties matters most.

Who is at higher risk?

- An undescended testicle (cryptorchidism), the best-established risk factor
- A father or brother who had testicular cancer
- Cancer in one testicle before (the other testicle is then at higher risk)
- Infertility or subfertility, and genetic conditions such as Klinefelter syndrome
- Untreated HIV, which is linked to a higher risk of one type (seminoma)
- Cannabis use, which some studies link to higher risk, though the evidence is not settled

Prevention

There is no proven way to prevent testicular cancer, because most risk factors (such as an undescended testicle or family history) are present from birth. What you can control is finding it early. If a boy's testicle has not descended, a doctor should assess it in infancy. A man who has had treatment for an undescended testicle still needs to examine himself.

Early detection: the monthly self-check

Medical bodies differ on whether routine screening of men with no symptoms is worthwhile, and the American Academy of Family Physicians advises against it. Even so, most cases are first noticed by the man himself, so a monthly check is a sensible habit, particularly for men aged 15 to 45.

1. Check after a warm bath or shower, when the scrotal skin is relaxed.
2. Hold the scrotum and examine each testicle separately, rolling it gently between your thumb and fingers.
3. Feel for hard lumps, smooth rounded bumps, or any change in size, shape or firmness. It is normal for one testicle to be slightly larger or hang lower.
4. Know the structure at the back of each testicle (the epididymis), so you do not mistake it for a lump.

Warning signs

- A lump or swelling in either testicle, often painless
- A feeling of heaviness or an ache in the scrotum or lower abdomen
- Pain or discomfort in a testicle or the scrotum
- Rarely, back pain, cough or breathlessness if the cancer has spread

Many causes of scrotal swelling are not cancer, but a lump should be checked within days to weeks, not months.

Diagnosis

The doctor examines you and orders a scrotal ultrasound, which is usually the first test, plus blood tests for tumour markers. If cancer is likely, the whole testicle is removed through the groin. A needle biopsy is avoided because it can spread cancer cells into the scrotum.

Treatment and outlook

- **Surgery (orchiectomy):** removing the affected testicle is the first step and often the only one needed for early disease. A man can still father children and have normal hormone function with one healthy testicle.
- **Surveillance:** for some stage I tumours at low risk of relapse, regular monitoring after surgery is a reasonable option.
- **Chemotherapy or radiation:** used when the tumour is more advanced or at higher risk of returning. Even after it has spread, chemotherapy cures more than 80% of men.
- **Survival by stage:** about 99% for stage I, 92% for stage II and 85% for stage III.

Treatment can affect fertility, so men should ask about sperm banking before treatment starts. Survivors need long-term follow-up because they have a higher risk of a second cancer.

Penile cancer

Penile cancer is rare and often curable when treated early, but untreated, it can spread to the lymph nodes early in the disease. Delay, usually from embarrassment, is the main reason it is found late. Unlike testicular cancer, much of its risk is preventable.

Who is at higher risk?

- **HPV infection**, especially HPV 16. HPV is linked to roughly 40% to 60% of penile cancers, depending on the source.
- **Smoking and tobacco use**
- **Phimosis** (a foreskin that cannot be pulled back), chronic inflammation, and poor genital hygiene, which let moisture and debris build up under the foreskin
- **Genital warts** and other sexually transmitted infections
- **Older age**, with risk rising particularly after 60
- **Not being circumcised**, which is associated with higher risk
- Rarely, past treatment of psoriasis with UV light and the drug psoralen (PUVA)

Prevention

- **Get the HPV vaccine.** It protects against the HPV types behind most HPV-related cancers, including HPV 16, and works best when given before sexual activity starts.
- **Use condoms** and limit the number of partners to lower the chance of HPV infection.
- **Do not smoke**, and get help to stop if you do.
- **Wash daily**, including under the foreskin if you have one, and dry well afterwards.
- **See a doctor about phimosis** or recurring inflammation rather than putting up with it.
- **Circumcision** may lower risk, but it is not a substitute for HPV vaccination, hygiene and avoiding tobacco.

Early detection

There is no screening test, so detection depends on you knowing what is normal for your body and checking regularly, including under the foreskin. Persistent changes are the signal to act.

Warning signs

- A sore, ulcer, lump, growth or crusted area on the head or foreskin that does not heal within a few weeks
- A change in skin colour or thickness, or a rash that does not clear
- Bleeding or an unusual, foul-smelling discharge under the foreskin
- Swelling of the penis, or a lump in the groin (swollen lymph nodes)

These signs are more often caused by infection or skin conditions, but a sore that does not heal needs a doctor's examination.

Diagnosis

A doctor examines the area and takes a biopsy of the lesion to confirm cancer. Imaging and a check of the groin lymph nodes show whether it has spread. Testing the tumour for HPV may also be done.

Treatment

Treatment depends on the size and position of the tumour and how far it has spread. Surgery is the main treatment, and early tumours can often be removed with limited tissue loss, which keeps the penis as intact as possible. Options include removing only the tumour, circumcision, laser or topical treatment for very early lesions, and partial or total removal of the penis in advanced cases. Radiation, chemotherapy and immunotherapy are used when the cancer has spread to the lymph nodes or beyond. A specialist urology or uro-oncology team should manage treatment, and men should ask about counselling and reconstructive options.

Prostate cancer

Prostate cancer is the most common cancer in men in many countries, and over 99% of men whose cancer is found before it spreads beyond the prostate are alive five years later. It often causes no symptoms early on, so screening is the only reliable way to find it in time.

Who is at higher risk?

- **Age**, especially over 50, with the average age at diagnosis in the mid to late 60s
- **Black African ancestry.** Black men are at higher risk of aggressive disease, and CANSA advises that black African men consider screening from age 40.
- **A family history** of prostate cancer, or of breast cancer in close relatives
- **Inherited gene changes** such as BRCA1 and BRCA2

Prevention

No method has been proven to prevent prostate cancer, but a healthy lifestyle lowers the risk of dying from cancer generally and helps you cope with treatment: do not smoke, keep a healthy weight, stay physically active, limit alcohol and eat plenty of vegetables and fruit.

Early detection: the PSA test

The first screening test is a PSA (prostate-specific antigen) blood test, sometimes with a digital rectal examination. The PSA test is imperfect: it can be raised by infection or an enlarged prostate, and it can find slow-growing cancers that would never have caused harm. For that reason, guidelines recommend a shared decision between you and your doctor. The 2026 American Urological Association guideline advises:

- A baseline PSA may be offered at age 45 to 50.
- Men at higher risk (Black men, men with a strong family history or inherited gene mutations) should be offered screening from age 40 to 45.
- Between ages 50 and 69, screening is offered every 2 to 4 years, with the interval and the decision to stop tailored to your PSA, health and life expectancy.
- A raised PSA is repeated before further tests, and an MRI scan is increasingly used before deciding on a biopsy.

The NCCN and European guidelines agree on the same overall approach. South African advice is often stricter, with some

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organisations recommending yearly testing, so ask your doctor what suits you.

Warning signs

Early prostate cancer usually has no symptoms. Later signs can include:

- Needing to pass urine often, especially at night, or a weak or interrupted stream
- Difficulty starting or stopping urination, or a feeling the bladder is not empty
- Blood in the urine or semen
- Pain in the lower back, hips or pelvis, or erection problems

Most of these symptoms are caused by benign prostate enlargement, which is common with age, but they still deserve a check.

Diagnosis

An abnormal PSA or examination leads to an MRI scan and, if needed, a biopsy. The biopsy grades the cancer (the Gleason score or Grade Group), which shows how aggressive it is and guides treatment.

Treatment options

- **Active surveillance:** for low-risk, slow-growing cancer, regular PSA tests, scans, and repeat biopsies instead of immediate treatment, avoiding side effects the cancer may never justify.
- **Surgery:** removal of the prostate (radical prostatectomy).
- **Radiation therapy:** external beam radiation, or radioactive seeds placed in the prostate (brachytherapy).
- **Hormone therapy (androgen deprivation):** lowers testosterone to slow cancer that is advanced or has spread. It has life-changing side effects, which is one reason to find the cancer early.
- **Chemotherapy, newer hormone drugs and targeted therapy:** for advanced disease.

Side effects of treatment can include urinary leakage and erectile problems, and these are worth discussing openly before choosing. In South Africa, men commonly present late, when cure is no longer possible, which is why earlier testing is stressed.

Male breast cancer and other cancers in men

Men have breast tissue too, and breast cancer in men is rare (about 1 in 100 breast cancers) but is often found late because few men think to check. Men tend to be diagnosed at a more advanced stage than women, which affects treatment and survival.

Risk factors: older age (most often over 60), a family history of breast cancer, BRCA1 or BRCA2 gene changes (which also raise the risk of aggressive prostate and pancreatic cancer), previous chest radiation, oestrogen-containing hormone treatment, liver cirrhosis, obesity, heavy alcohol use, Klinefelter syndrome and some testicular conditions.

Warning signs: a lump or thickening in the chest, usually behind the nipple and often on one side only; a nipple that turns inward, changes shape, or has a discharge or bleeding; and skin dimpling, redness or scaling. Any chest lump in a man should be examined, even though most are harmless.

Treatment: surgery to remove the breast tissue is the most common first treatment. Many male breast cancers are hormone-sensitive, so hormone therapy such as tamoxifen is often used, with radiation, chemotherapy or targeted drugs depending on the stage and tumour type.

A shared message for all men: men with a strong family history of breast, ovarian, prostate or pancreatic cancer should ask a doctor about genetic counselling, since an inherited gene change can affect cancer risk across several organs. Smoking and heavy alcohol use raise the risk of many cancers in men, including cancers of the mouth, throat, lung, bladder and colon, so the habits that protect against penile and breast cancer protect against these as well.

What every man can do

The most effective steps are simple, cost little and take a few minutes each month or a visit to a clinic every one or two years.

Reduce your risk

- Do not smoke, and limit alcohol.
- Keep a healthy weight and stay physically active.
- Get the HPV vaccine if you are eligible, and make sure boys are vaccinated before they become sexually active.
- Use condoms, and treat genital warts and infections promptly.
- Keep the genital area clean, including under the foreskin.

Find problems early

What	Who	How often
Testicular self-check	**Men and boys from about age 15, especially to age 45**	**Monthly**
Penis and groin self-check	**All men**	**Monthly, with a quick look for sores or changes**
Chest check for lumps.	**All men, especially with a family history**	**Occasionally, and whenever you notice a change**
PSA discussion with a doctor	**From 45 to 50, or from 40 if you are Black African or have a family history**	**Interval agreed with your doctor, commonly every 2 to 4 years**

See a doctor promptly if you notice

- A lump, swelling or heaviness in a testicle
- A sore, growth or discharge on the penis that does not heal in a few weeks
- A lump in the chest or a change in a nipple
- New urinary problems, or blood in urine or semen
- Unexplained weight loss, bone pain or lasting tiredness

Break the silence

Embarrassment, fear of the result and the belief that checks threaten manhood cost men their lives. A clinic visit for a lump is routine for the staff who see these problems every day, and early treatment is usually simpler and keeps more of your health and function. Talk about it with the men in your life, especially younger brothers, sons and friends, and encourage one another to get checked. CANSA and similar organisations run free awareness and screening information, and November (Movember) is a good reminder each year.

In South Africa, ask your clinic or local doctor about PSA testing and about wellness benefits on your medical scheme, which may cover preventive checks.

Sources

Statistics and guidelines are as of October 2026. Check current local advice with your doctor.

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Diabetes-induced alterations in the oral microbiota of companion animals and their relationship with periodontal inflammation

Teodor-Daniel Hrițcu [1], Alexandru Munteanu [1,], Ștefan Mihalcea [2,*], Luminița-Diana Hrițcu [1], Eusebiu-Viorel Șindilar [1], Florin Nechifor [1], Vasile Boghian [1], Andra-Cristina Bostănaru-Iliescu [1] and Mihaela-Claudia Spataru [1]*

[1] "Ion Ionescu de la Brad" Iasi University of Life Sciences, Faculty of Veterinary Medicine, 3 Mihail Sadoveanu Alley, 700490 Iasi, România

[2] VETSOLUTIONS, 1 Cour du Havre, 75008 Paris, France

** Correspondence: alexandu.munteanu@iuls.ro (A.M.), stefan.mihalcea@vetsolutiions.eu (S.M.)*

Abstract: Diabetes mellitus is a common endocrine disorder in geriatric companion animals, with significant implications for systemic homeostasis and oral health. This study investigated the interrelationship between hyperglycemia-induced metabolic imbalance, alterations in oral microbiota composition, and the severity of periodontal inflammation, based on three clinical cases (two dogs and one cat) diagnosed with diabetes mellitus and concurrent dental pathology. Clinical examination revealed moderate to severe periodontal disease in all evaluated cases. Microbiological analysis of dental plaque demonstrated a dysbiotic profile characterised by the presence of opportunistic bacteria, with predominance of *Pseudomonas aeruginosa*, alongside *Enterococcus faecium* and *Hafnia alvei*, suggesting an increased pathogenic potential in the context of an altered oral environment.

Haematological and biochemical findings indicated persistent hyperglycemia and a mild systemic inflammatory status, while oral pH measurements showed a shift toward acidic values, favouring the proliferation of pathogenic microbiota. Therapeutic management included the initiation of antidiabetic treatment (insulin therapy or oral medication), combined with antimicrobial and anti-inflammatory therapy, as well as targeted dental interventions. The findings support a bidirectional relationship between metabolic imbalance, oral dysbiosis, and periodontal disease progression, highlighting the importance of an integrated therapeutic approach in the clinical management of diabetic veterinary patients.

1. Introduction

Diabetes mellitus represents one of the most prevalent endocrine disorders in companion animals, with increasing evidence showing that its metabolic alterations extend to the oral cavity and significantly influence the oral microbiota and periodontal inflammatory processes [Hrițcu et al., 2025; Negrini et al., 2021].

Recent studies emphasise a complex bidirectional relationship between diabetes and periodontal disease, mediated by microbial dysbiosis and dysregulated host immune responses that promote chronic inflammation in the oral environment [Hrițcu et al., 2025; Negrini et al., 2021]. The oral microbiome of healthy dogs and cats is composed of diverse microbial communities that are essential for maintaining oral homeostasis and physiological balance [Dewhirst et al., 2012, Anderson et al., 2023].

In contrast, periodontal disease is associated with a significant microbial imbalance characterised by a reduction in beneficial commensals and an overgrowth of pathogenic bacterial species [Davis & Weese, 2022, Negrini et al., 2021]. In diabetic companion animals, hyperglycemia contributes to alterations in the oral environment by impairing immune defences and promoting conditions that favour microbial dysbiosis and periodontal inflammation [Hrițcu et al., 2025].

Specific periodontal pathogens such as *Fusobacterium nucleatum*, *Treponema denticola*, and *Porphyromonas gulae* have been identified as key microbial biomarkers associated with gingivitis and periodontitis in small animals [Kwack et al., 2025, Kwon et al., 2025, Kwack et al., 2025]. Periodontal disease is increasingly recognised not only as a localised oral condition but also as part of a broader systemic inflammatory network influenced by metabolic diseases such as diabetes mellitus [Wallis et al., 2025, Hrițcu et al., 2025].

Therapeutic strategies targeting the oral microbiota, including antimicrobial approaches and microbial modulation therapies, are being explored to restore microbial balance and reduce periodontal inflammation in affected animals [Rahmani et al., 2025, Song et al., 2024, Yang and Moon, 2026]. Evidence also suggests that diabetes-associated microbial alterations are not limited to the oral cavity, as significant changes in gut microbiota composition have been observed in diabetic dogs [Kwong et al., 2023].

Furthermore, shared environmental and biological factors between pets and their owners may contribute to overlapping risks for metabolic and microbial dysregulation [Delicano et al., 2020; Oh et al., 2015]. Overall, diabetes-induced alterations in the oral microbiota play a crucial role in the development and progression of periodontal inflammation in companion animals, highlighting the importance of integrated metabolic and oral health management [Hrițcu et al., 2025, Negrini et al., 2021].

2. Materials and Methods

The present study included three geriatric companion animals, consisting of two dogs and one cat, all diagnosed with diabetes mellitus and presenting clinically evident dental and periodontal disorders of varying severity. All subjects were under specific and continuous therapeutic management for diabetes mellitus, including dietary regulation and insulin therapy adapted to each case.

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A complete clinical examination was performed for each animal, with particular emphasis on the evaluation of the oral cavity. This included inspection of the gingival tissues, assessment of the presence and severity of dental plaque and calculus, the degree of periodontal inflammation, and the overall oral hygiene status. Clinical findings were correlated with the systemic condition of each patient in order to identify possible associations between metabolic disease and oral pathology.

For microbiological investigation, oral samples were collected using sterile swabs from periodontal pockets and gingival margins. For bacterial isolation, the samples were cultured on blood agar, MacConkey agar, and Müller–Hinton agar. The plates were incubated at 37°C under both aerobic and strict anaerobic conditions. Subsequently, identification of the isolated bacterial species was performed using MALDI-TOF mass spectrometry with the MALDI-TOF Zybio system, a method that enables rapid and accurate identification based on specific protein profiles.

In addition, blood samples were collected for haematological and biochemical analyses. Haematological evaluation included general parameters relevant to systemic inflammation and overall health status, while biochemical testing focused on metabolic indicators used in the monitoring of diabetes mellitus. These investigations were used to characterise the systemic condition and the degree of metabolic control in each subject. Oral cavity pH was also assessed as an auxiliary parameter reflecting the local oral environment. This variable was analysed in relation to microbial changes and periodontal status, considering the known influence of pH on bacterial growth and biofilm formation.

All animals were maintained under individualised diabetic management protocols throughout the study period. Data interpretation was performed descriptively, taking into account the small sample size, with emphasis on identifying potential relationships between diabetes mellitus, alterations of the oral microbiota, and the presence of periodontal inflammation in geriatric companion animals.

3. Results

3.1 Clinical characterisation of the cases

The study included three geriatric companion animals, consisting of two dogs and one cat, all diagnosed with diabetes mellitus and undergoing specific therapeutic management. All patients were receiving individualised treatment protocols aimed at glycemic control, including insulin therapy and dietary management adapted to their clinical condition.

At the time of evaluation, all cases exhibited clinical signs associated with both the underlying metabolic disorder and with oral and periodontal pathology. Systemic manifestations related to diabetes mellitus varied among individuals and included differences in overall body condition, hydration status, and general vitality.

In parallel, all animals presented varying degrees of oral and dental disease, ranging from moderate to severe periodontal involvement. Clinical signs included gingival inflammation, accumulation of dental plaque and calculus, and evidence of periodontal tissue damage. The severity of both systemic and oral manifestations appeared to vary between cases, suggesting a possible relationship between metabolic control and the extent of oral pathology.

3.2 Clinical evaluation of the oral cavity

Oral examination revealed the presence of periodontal disease in all three cases, characterised by gingivitis, dental plaque and calculus accumulation, and varying degrees of gingival inflammation (Figure 1–3).



Figure 1. Clinical cases included in the study

In addition to these findings, halitosis and gingival recession were observed in some individuals, indicating progression of periodontal tissue damage beyond the initial inflammatory stage.

The severity of oral lesions varied among the included animals, being more pronounced in cases with poorer glycemic control and more advanced systemic manifestations of diabetes mellitus.

Clinically, the periodontal involvement ranged from moderate to severe, with evident disruption of normal gingival architecture and increased dental biofilm accumulation.

The distribution and intensity of lesions differed between cases, suggesting an interrelationship between systemic metabolic status and oral health deterioration in diabetic geriatric animals.

Overall, the findings indicate that chronic hyperglycemia may contribute to the progression and exacerbation of periodontal pathology in companion animals.

3.3 Oral microbiological profile

The microbiological investigation of oral samples revealed significant alterations in the bacterial composition of the oral cavity in all three geriatric diabetic animals.

The analysis was performed using culture-based identification methods, based on bacterial growth from samples collected directly from dental plaque. This approach enabled the isolation of microorganisms associated with periodontal biofilm and the characterisation of the oral microbiota.

The results demonstrated the presence of three main bacterial taxa: *Hafnia alvei*, *Pseudomonas aeruginosa*, and *Enterococcus faecium*. All identified species are considered opportunistic microorganisms, capable of colonising altered biological environments and contributing to chronic inflammatory processes.

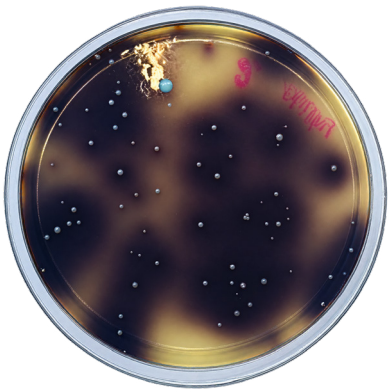
Species identification was performed using matrix-assisted laser desorption/ ionization time-of-flight mass spectrometry (MALDI-TOF MS), with identification scores of 2.43 for *Enterococcus faecium*, 2.41 for *Hafnia alvei*, and 2.03 for *Pseudomonas aeruginosa*.

These values are consistent with high-confidence identification at the species level according to standard MALDI-TOF MS interpretative criteria.

These findings indicate a dysbiotic shift in the oral microbiota, characterised by the presence of opportunistic bacteria within a periodontal environment affected by chronic inflammation and diabetes-associated metabolic imbalance (Figure 2 A-C).



A. Hafnia alvei



B. Enterococcus faecium



C. Pseudomonas aeruginosa

Figure 2. A-C. Bacterial growth on MacConkey culture medium from dental plaque samples collected from diabetic companion animals.



Bacterial species	Identification score
Hafnia alvei	2.41
Pseudomonas aeruginosa	2.03
Enterococcus faecium	2.43

Table 1. MALDI-TOF MS identification scores of bacterial isolates from oral plaque samples of diabetic companion animals

3.4 Haematological and biochemical parameters

Haematological and biochemical analyses were performed in all three geriatric companion animals in order to evaluate systemic status, metabolic control, and the presence of inflammatory or organ-related alterations associated with diabetes mellitus and concurrent periodontal disease. The obtained results revealed a pattern consistent with chronic metabolic imbalance accompanied by low-grade systemic inflammatory activity, with interindividual variability among cases.

All three animals exhibited persistent hyperglycemia, with values exceeding the physiological reference range despite ongoing insulin therapy and dietary management. This finding confirms suboptimal glycemic control and indicates a chronic disruption of glucose homeostasis. Such metabolic instability is clinically relevant, as sustained hyperglycemia is known to impair immune function, delay tissue repair, and increase susceptibility to infections, including periodontal disease.

A mild to moderate leukocytosis was observed in all cases, suggesting a chronic systemic inflammatory response. This inflammatory state is likely multifactorial, being associated both with diabetes mellitus and concurrent periodontal disease.

Chronic oral inflammation may act as a continuous source of inflammatory mediators, contributing to systemic immune activation and potentially worsening insulin resistance.

Erythrocytic parameters remained within or close to physiological reference ranges in all animals, indicating the absence of significant anaemia or advanced haematological compromise at the time of evaluation. This suggests a relatively compensated systemic condition under ongoing therapeutic management.

Biochemical analysis revealed mild elevations of hepatic enzymes (ALT and AST) in two cases, suggesting possible subclinical hepatocellular stress related to chronic metabolic burden or systemic inflammation. Renal parameters (urea and creatinine) remained within acceptable limits, indicating preserved renal function in all subjects.

Overall, the haematological and biochemical profile reflects a chronic but compensated systemic condition characterised by persistent hyperglycemia, mild inflammatory activation, and minimal organ dysfunction.

These findings may be associated with the severity of oral pathology and microbial dysbiosis observed in the same animals.

3.5 Oral cavity pH

The oral pH assessment in the three geriatric diabetic companion animals demonstrated a consistent shift toward mildly to moderately acidic values compared to the physiological oral pH range.

This alteration reflects a modification of the local oral environment, likely influenced by both systemic metabolic dysregulation and concurrent periodontal disease (Table 3).

Parameter	Reference range	Case 1 (Dog)	Case 2 (Dog)	Case 3 (Cat)
Glucose (mg/dL)	70–120	248	312	276
WBC ($\times 10^9$/L)	6.0–17.0	14.8	16.2	13.5
RBC ($\times 10^{12}$/L)	5.5–8.5 (dog) / 5.0–10.0 (cat)	6.1	5.8	6.9
Hemoglobin (g/dL)	12–18 (dog) / 8–15 (cat)	13.4	12.9	11.8
ALT (U/L)	10–60	68	74	55
AST (U/L)	10–50	45	52	41
Creatinine (mg/dL)	0.5–1.8	1.6	1.9	1.4
Urea (mg/dL)	20–50	48	52	39

Table 2. Haematological and biochemical parameters in diabetic companion animals

Case	Species	Oral pH value	Physiological reference range	Interpretation
Case 1	Dog	6.4	6.8 – 7.2	Mildly acidic
Case 2	Dog	6.1	6.8 – 7.2	Moderately acidic
Case 3	Cat	6.3	6.8 – 7.2	Mildly acidic

Table 3. Oral cavity pH values in diabetic companion animals

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The observed acidification of the oral cavity is clinically relevant, as oral pH plays a crucial role in maintaining microbial homeostasis. A reduction in pH promotes the selective proliferation of acid-tolerant and opportunistic bacterial species, while simultaneously disrupting the balance of commensal microbiota. In the present study, this environmental shift is consistent with the microbiological findings, which demonstrated a dysbiotic oral profile characterised by the presence of opportunistic bacteria.

Among the included cases, Case 2 (dog) exhibited the lowest oral pH value (6.1), corresponding to a moderately acidic environment, suggesting a more pronounced alteration of the oral ecosystem. In comparison, Case 1 (dog) and Case 3 (cat) showed slightly higher but still reduced pH values (6.4 and 6.3, respectively), both classified as mildly acidic. These findings indicate a variable degree of oral environmental disruption among individuals, with a tendency toward greater acidification in the case associated with more severe systemic and periodontal involvement.

From a pathophysiological perspective, chronic hyperglycemia may contribute to alterations in salivary composition, increased glucose availability in oral fluids, and changes in bacterial metabolic activity, all of which can promote a more acidic oral environment. This, in turn, may facilitate biofilm maturation, persistence of periodontal pathogens, and progression of inflammatory periodontal lesions.

Overall, the findings support the role of oral pH as an integrative and clinically relevant parameter reflecting the interaction between systemic metabolic disease and local periodontal pathology in diabetic companion animals.

3.6 Clinical therapeutic management

All three geriatric companion animals included in the study were managed using individualised therapeutic protocols targeting both diabetes mellitus and associated periodontal disease. The therapeutic approach was multimodal, combining systemic metabolic control, antimicrobial and anti-inflammatory therapy, hepatoprotective support, and local dental interventions, alongside hygienic–dietary management.

Systemic antibiotic therapy with broad-spectrum coverage was administered in all cases using ceftriaxone (Cefort), at a commonly used dosage of approximately 20–30 mg/kg once daily, depending on species and clinical severity, for a limited therapeutic course. This treatment aims to control bacterial load associated with oral infection and reduce the risk of systemic dissemination. In parallel, non-steroidal anti-inflammatory therapy (Melovem – meloxicam) was administered at an approximate dosage of 0.1 mg/kg on the first day, followed by 0.05 mg/kg once daily, to reduce gingival inflammation, alleviate pain, and limit periodontal tissue damage. Metabolic control differs between species. The feline patient was managed with an oral antidiabetic agent, dapagliflozin (Forxiga), administered at an approximate dosage of 0.5–1 mg/kg once daily, with the aim of improving glycemic control through increased urinary glucose excretion. The two canine patients were treated with insulin glargine (Lantus), administered subcutaneously at an initial dosage of approximately 0.25–0.5 IU/kg twice daily, adjusted according to glycemic response and clinical evolution.

In addition to antidiabetic therapy, all animals received hepatoprotective support using human-formulated hepatoprotective agents (e.g., essential phospholipids or silymarin-based products), administered according to body weight and clinical indication, in order to support hepatic function affected by chronic metabolic imbalance.

Local dental management differed between cases. In the canine patients, mechanical dental scaling (detartrage) was performed to remove dental plaque and calculus, thereby reducing bacterial biofilm and improving periodontal status. In the feline patient, local therapy included topical application of methylene blue within the oral cavity for its mild antiseptic and anti-inflammatory effects, as well as extraction of a severely affected canine tooth, eliminating a chronic source of infection.

All animals were also placed on hygienic–dietary management, consisting of commercially available diabetic diets (both wet and dry formulations), designed to support glycemic control through regulated carbohydrate content and optimised nutrient balance.

Overall, therapeutic management highlights the importance of an integrated approach in diabetic companion animals, combining systemic metabolic stabilisation with targeted antimicrobial, anti-inflammatory, hepatoprotective, and dental interventions.

This comprehensive strategy is essential for controlling both the underlying endocrine disorder and the associated oral inflammatory pathology.

4. Discussion

The present study provides a clinical and microbiological insight into the interaction between diabetes mellitus and oral health in geriatric companion animals, emphasising the role of metabolic imbalance in shaping periodontal pathology and oral microbial composition [Hrițcu et al., 2025; Negrini et al., 2021].

The clinical findings demonstrated that all included animals presented moderate to severe periodontal disease, with lesion severity appearing to be associated with the degree of metabolic imbalance [Hrițcu et al., 2025, Negrini et al., 2021].

This observation aligns with previous studies indicating that poor glycemic control contributes to increased susceptibility to periodontal inflammation and delayed tissue repair mechanisms, thereby exacerbating oral pathology in diabetic patients [Hrițcu et al., 2025, Negrini et al., 2021].

A key finding of this study is the identification of a dysbiotic oral microbiological profile characterised by the presence of opportunistic bacterial species, including *Hafnia alvei*, *Pseudomonas aeruginosa*, and *Enterococcus faecium* [Davis & Weese, 2022].

Unlike classical periodontal pathogens, these microorganisms are indicative of an ecological shift within the oral cavity, where altered local and systemic conditions favour the proliferation of adaptable, non-traditional taxa [Davis & Weese, 2022]. This observation supports the concept that periodontal disease is not solely driven by specific pathogens but rather represents the outcome of a complex microbial imbalance (dysbiosis) [Negrini et al., 2021].

Bacterial identification was achieved using MALDI-TOF MS, with all isolates yielding high-confidence identification scores at the species level. As these scores reflect identification reliability rather than bacterial abundance, no quantitative inference regarding microbial load or dominance can be made. Nevertheless, the concurrent detection of multiple opportunistic species suggests a polymicrobial environment associated with periodontal biofilm.

These findings are consistent with the concept of polymicrobial synergy in periodontal disease, whereby microbial communities interact functionally to sustain inflammation and contribute to tissue destruction [Negrini et al., 2021]. The acidic shift in oral pH observed across all cases further reinforces the presence of an altered oral microenvironment [Negrini et al., 2021].

The lowest pH value recorded in the most clinically affected case suggests that local biochemical conditions may directly influence both microbial composition and disease severity [Negrini et al., 2021].

Acidification of the oral cavity is known to enhance bacterial adhesion, biofilm stability, and metabolic activity, thereby contributing to the persistence of dysbiosis and progression of periodontal lesions [Negrini et al., 2021].

Haematological and biochemical findings provided additional evidence of systemic involvement, with persistent hyperglycemia and mild leukocytosis observed in all cases [Hrițcu et al., 2025].

These results indicate a chronic low-grade inflammatory state, which may act synergistically with local periodontal inflammation [Hrițcu et al., 2025].

The presence of mild hepatic enzyme elevations in some animals also supports the concept of systemic metabolic stress associated with diabetes mellitus [Hrițcu et al., 2025].

The therapeutic protocols applied in the present study reflect a comprehensive and clinically relevant approach, combining metabolic control with targeted oral interventions [Aptekmann et al., 2014; Rahmani et al., 2025].

The use of insulin therapy in dogs and oral antidiabetic agents in feline cases, alongside antimicrobial and anti-inflammatory treatment, aimed to simultaneously address both systemic and local pathological processes [Aptekmann et al., 2014].

Mechanical dental scaling and tooth extraction further contributed to the reduction of bacterial load and elimination of chronic infection foci, which are essential steps in periodontal management [Rahmani et al., 2025].

Despite these interventions, the persistence of dysbiosis and altered oral parameters suggests that standard therapeutic approaches may not fully restore microbial balance, particularly in the context of chronic metabolic disease [Hrițcu et al., 2025].

This highlights the potential need for adjunctive strategies, such as microbiome-targeted therapies or probiotic-based interventions, which have been proposed as emerging tools in the management of diabetes-associated dysbiosis [Hrițcu et al., 2025; Yang and Moon, 2026].

Another important aspect is the systemic implication of periodontal disease, which is increasingly recognised as a contributor to overall inflammatory burden [Dewey & Rishniw, 2021; Kamer et al., 2020].

The coexistence of diabetes and periodontal inflammation may therefore represent a self-perpetuating cycle, in which metabolic dysregulation promotes oral disease, while chronic oral inflammation further impairs metabolic control [Hrițcu et al., 2025].

Although limited by the small number of cases, this study provides relevant clinical correlations between metabolic status, oral microbiota alterations, and periodontal disease severity [Negrini et al., 2021].

The findings emphasise the importance of early diagnosis, regular oral monitoring, and integrated therapeutic management in diabetic companion animals [Hrițcu et al., 2025].

Overall, the results support the concept that diabetes mellitus plays a significant role in modulating the oral ecosystem, contributing to dysbiosis and periodontal inflammation, and underline the necessity of a multidisciplinary approach in the management of affected patients [Hrițcu et al., 2025, Negrini et al., 2021].

5. Conclusion

Diabetes mellitus has a significant impact on oral health in companion animals by promoting microbial dysbiosis and exacerbating periodontal inflammation. The present study demonstrated that geriatric diabetic animals exhibit consistent alterations in the composition of the oral microbiota, a shift toward acidic oral pH, and varying degrees of periodontal disease severityThe findings support a close association between metabolic imbalance and oral pathology, suggesting that inadequate glycemic control contributes to the progression of periodontal lesions and the establishment of an unfavourable oral environment.

Moreover, the persistence of dysbiosis despite therapeutic management highlights the need for integrated treatment strategies that address both systemic metabolic control and local oral conditions.

Overall, the effective management of diabetic companion animals requires a multidisciplinary approach, combining metabolic stabilisation, dental care, and targeted microbial control in order to improve both oral and overall health outcomes. V

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Effect of High-Fat Diet (HFD) on Progression of Cardiomyopathy and Nephropathy

Aruna B.[1], Sujith S.[1], Sanis Juliet[1], Ranjith D.[1], Pradeep M.[2], Divya P. D.[3], Adheena Xavier[1], Bindu Shree R.[1], Ananthu Vijayakrishnan[1] and Deepanjaly S.[1]
[1]Dept. of Veterinary Pharmacology and Toxicology, [2]Dept. of Veterinary Pathology, [3]Dept. of Veterinary Biochemistry, College of Veterinary and Animal Sciences, Pookode, Kerala Veterinary and Animal Sciences University, Wayanad, Kerala (673 576), India

ABSTRACT

The effect of a high-fat diet (HFD) on the progression of cardiomyopathy and nephropathy. Diabetes mellitus was identified as a chronic metabolic disorder characterised by persistent hyperglycemia, which contributed to severe complications such as cardiomyopathy and nephropathy. High-fat diet intake further aggravated metabolic imbalances, thereby accelerating the progression of these systemic complications. The present study evaluated cardiac and renal functions in Wistar rats fed an HFD following streptozotocin (STZ)-induced diabetes. Diabetes was induced using STZ (40 mg kg^{-1}, i.p.) in HFD-fed rats, and animals with blood glucose levels exceeding 300 mg dl^{-1} four days post-induction were considered diabetic.

Diabetic animals were compared with normal rats to assess metabolic, renal, and cardiac alterations. Body weight, blood glucose, total cholesterol, triglycerides, blood urea nitrogen (BUN), creatinine, and creatine kinase-myoglobin binding (CK-MB) were assessed at baseline, pre-induction, and on days 1, 14, and 28. Diabetic rats on HFD showed persistent hyperglycemia, progressive weight loss, and severe dyslipidemia. Elevated renal markers, specifically BUN and creatinine, and increased CK-MB levels indicated the progression of nephropathy and cardiomyopathy.

These results demonstrated that HFD accelerated metabolic disturbances and promoted significant target organ damage in diabetes. The findings highlighted that sustained lipid abnormalities and hyperglycemia synergistically worsened myocardial and renal injury over the experimental period.

1. INTRODUCTION

Diabetes mellitus is a collection of metabolic diseases characterised by high blood glucose levels, or hyperglycaemia (Olefsky, 2001). This hyperglycaemia arises from a relative or total lack of insulin secretion, a resistance to the action of insulin, or both of these factors (Babu et al., 2013). According to the International Diabetes Federation, approximately 537 million adults worldwide were living with diabetes in 2021, and this number is projected to rise to 783 million by 2045, highlighting the escalating global health burden. Based on etiopathogenesis, DM is classified into Type 1 and Type 2 diabetes mellitus (Nicolle et al., 2011): type 1, which results from the immune system's destruction of the body's own insulin-producing pancreatic cells, and type 2, the more prevalent form, which is characterised by the body's resistance to insulin in conjunction with an insufficient secretory response (Skyler, 2004).

Persistent hyperglycaemia results in progressive macrovascular and microvascular complications, among which diabetic cardiomyopathy and nephropathy are major contributors to diabetes-associated morbidity and mortality (Forbes and Cooper, 2013).

The development of diabetic complications is mediated by several interconnected biochemical mechanisms. Chronic hyperglycaemia activates protein kinase C (PKC), enhances flux through the polyol and hexosamine biosynthetic pathways, promotes the accumulation of advanced glycation end-products (AGEs), and increases oxidative stress.

These alterations converge to induce endothelial dysfunction, inflammatory signalling, and progressive organ damage (Zhang et al., 2016). Diabetes mellitus is associated with distinct microvascular alterations, including excessive extracellular matrix deposition and thickening of the capillary basement membrane, resulting in diabetic microangiopathy. Persistent hyperglycaemia, along with oxidative stress and inflammation, further contributes to the development of macrovascular complications. Additionally, microvascular injury may aggravate atherosclerotic progression through hypoxia and vasa vasorum dysfunction (Chawla et al., 2016). Advanced glycation end-products (AGEs) have been implicated in the progression of chronic kidney disease in diabetes. Their reactive precursor, methylglyoxal, has been shown to accelerate renal injury, particularly under conditions of reduced glyoxalase-1 activity.

Furthermore, AGEs may aggravate diabetic nephropathy by upregulating angiotensinogen expression, thereby contributing to renal dysfunction (Parveen et al., 2021). Chronic hyperglycaemia in diabetes induces microvascular alterations, oxidative stress, inflammation, impairment of the IRS–PI3K/Akt signalling pathway leading to insulin resistance, and accumulation of advanced glycation end-products and methylglyoxal under reduced glyoxalase-1 activity, collectively accelerating renal injury, angiotensinogen expression, and the progression of diabetic nephropathy and cardiovascular complications (Guo, 2014).

Consumption of a high-fat diet (HFD) plays a pivotal role in the development of Type 2 diabetes by promoting insulin resistance, dyslipidaemia, and metabolic stress (Lozano et al., 2016). The combination of a high-fat diet (HFD) and low-dose streptozotocin (STZ) induces diabetic complications in rats, characterised by micro- and macrovascular lesions, renal injury, and pathological features that resemble human diabetic nephropathy and vascular abnormalities (Rather et al., 2023).

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Sustained hyperglycaemia and lipid abnormalities exacerbate myocardial and renal injury, which can be evaluated through alterations in glycaemic status, lipid profile, cardiac injury markers, renal function indices, and body weight parameters. Therefore, the present study was undertaken to evaluate the effect of a high-fat diet on the progression of cardiomyopathy and nephropathy in streptozotocin-induced diabetic rats.

2. MATERIALS AND METHODS

The experiment was conducted during April, 2025 at the College of Veterinary and animal sceinces pookode to study the effect of high fat diet on the progression of cardiomyopathy and nephropathy.

2.1 Experimental animals

Twenty-four healthy adult male Wistar albino rats (≈150 g) were used in the present study. The animals were procured from an approved animal facility and housed under standard laboratory conditions with controlled temperature, relative humidity, and a 12 h light/dark cycle, with free access to a standard pellet diet and water unless otherwise specified.

All experimental procedures were conducted in accordance with the guidelines of the Institutional Animal Ethics Committee (IAEC), College of Veterinary and Animal Sciences, Pookode, and the study was approved under the protocol number IAEC/COVAS/PKD/25/10/2025.

2.2 Induction of type 2 diabetes mellitus

Type 2 diabetes mellitus was induced using a high-fat diet (HFD) and streptozotocin (STZ) model (Zhang et al. 2016). Rats were fed a high-fat diet for six weeks, followed by a single intraperitoneal injection of streptozotocin (STZ). Fasting blood glucose levels were measured on the fourth day after STZ injection, and rats showing blood glucose levels >300 mg dl^{-1} were considered diabetic and included in the study.

A high-fat diet (HFD) was prepared for the induction of Type 2 diabetes in rats. The diet was formulated using 55% normal pelleted feed, 29% lard, 10% casein, 5% vitamin and mineral mixture, and 1% cholesterol, yielding a total composition of 100%. The formulated HFD was designed to provide a higher fat and energy content compared with the normal pellet diet. Proximate analysis of both normal and high-fat diets was conducted in accordance with the guidelines of the Association of Official Analytical Chemists (AOAC). The normal pellet diet was found to contain 12.5% moisture, 17.4% crude protein, 7.5% total ash, and 4.5% ether extract. In contrast, the high-fat diet contained 7.4% moisture, 23.2% crude protein, 8.94% total ash, and 27.54% ether extract, confirming the elevated lipid content of the experimental diet.

2.3 Experimental design

Adult Wistar albino rats were randomly allocated into two experimental groups, with twelve animals in each group.

The normal control group received a standard pellet diet and served as non-diabetic controls. The diabetic control group was fed a high-fat diet, and diabetes was induced by administration of streptozotocin (STZ).

To evaluate the temporal progression of diabetic cardiomyopathy and nephropathy, six rats from each group were sacrificed on day 14, and the remaining six rats on day 28 post-diabetes induction.

2.4 Sample collection

Blood samples were collected from all animals before initiation of the high-fat diet, before diabetes induction, and on days 1, 14, and 28 post-induction under aseptic conditions. Blood samples were centrifuged to obtain serum, which was stored appropriately and used for biochemical estimations.

2.5 Biochemical analysis

The following biochemical parameters were assessed using spectrophotometry with commercial kits from Aagappe Diagnostics, Kerala:

- Fasting blood glucose (mg dl-1)
- Serum lipid profile, including total cholesterol (mg dl-1) and triglycerides (mmol l-1)
- Renal function markers, including blood urea nitrogen (BUN) (mg dl-1) and serum creatinine (mg dl-1)
- Cardiac injury marker, creatine kinase-MB (CK-MB) (U/L)

2.6 Statistical analysis

Data were expressed as mean±standard error. Statistical analysis was performed using SPSS software version 24.0. Differences between groups were analysed using appropriate statistical tests, and a value of $p<0.01$ was considered statistically significant.

3. RESULTS AND DISCUSSION

3.1 Effect of high-fat diet and STZ on blood glucose

Rats fed a high-fat diet followed by streptozotocin (HFD–STZ) administration exhibited a significant ($p<0.01$) elevation in fasting blood glucose levels compared to normal control rats (Table 1 and Figure 1).

In diabetic groups, blood glucose levels increased markedly by day 4 post-STZ and remained persistently elevated on day 14. In animals extended up to day 28, hyperglycaemia further progressed, indicating sustained diabetic status.

Normal control rats maintained stable glucose levels throughout the experimental period. Persistent hyperglycaemia observed in HFD–STZ rats plays a central role in initiating metabolic disturbances that contribute to the development of diabetic cardiomyopathy and nephropathy, as reported by Prabhakar (2016).

Hyperglycaemia in the HFD–STZ model is attributed to the combined effects of diet-induced insulin resistance and streptozotocin-mediated pancreatic β-cell injury.

Effect of High-Fat Diet (HFD)... <<<32

Group	Before the administration of HFD	On the day of administration of STZ(Day zero)	Day 4	Day 14	Day 28
Normal animals (Group I)	88.45±6.42^{aA}	90.45±8.23^{aA}	94.45±7.12^{aA}	89.65±8.35^{aA}	92.35±5.31^{aA}
Animals fed with HFD and STZ (Group II)	93.2625±12.34^{aB}	139.6625±14.29^{bB}	340.155±39.81^{cB}	310.355±21.26^{dB}	NA
Animals fed with HFD and STZ (Group II) were extended till the 28th day.	74.5±7.67^{aC}	131.5475±9.31^{bB}	362.0225±29.31^{cB}	375.54±57.15^{cC}	388.02+88.12^{cB}

Table 1: Effect of high-fat diet and streptozotocin on the blood glucose level of rats

Means with different superscripts differ significantly at the 1% level; letters a-e signify row-wise, and A-C signify column-wise comparison.

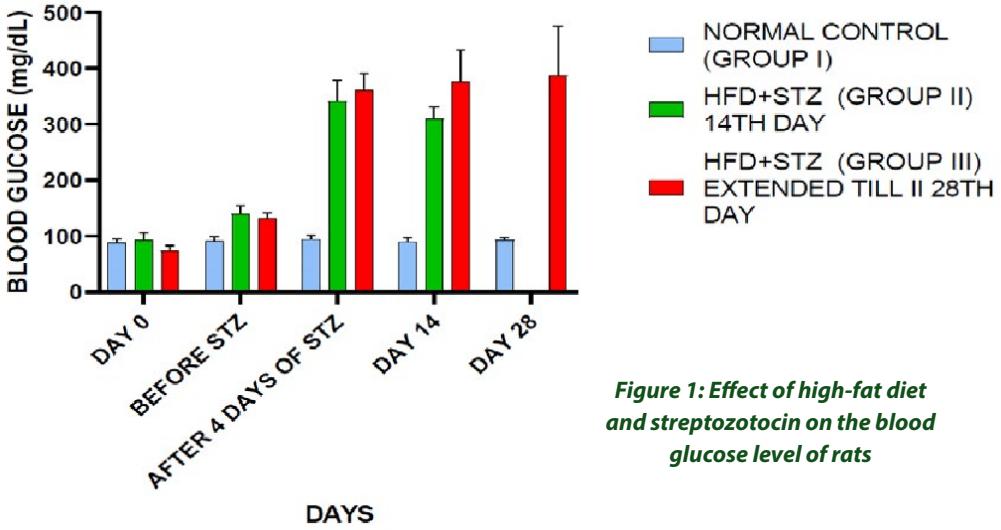


Figure 1: Effect of high-fat diet and streptozotocin on the blood glucose level of rats

High-fat feeding reduces peripheral insulin sensitivity, while streptozotocin selectively impairs β-cell function, resulting in decreased insulin secretion and disturbed glucose homeostasis. This dual insult leads to sustained dysregulation of glycaemic control through impaired insulin action and altered glucose metabolism, a mechanism consistently reported in experimental models of Type 2 diabetes (Wickramasinghe et al., 2022).

Prolonged HFD causes intracellular accumulation of diacylglycerols and ceramides in the liver and muscles. These lipid metabolites trigger proinflammatory JNK and IKKβ pathways, inducing serine phosphorylation of IRS-1. This disrupts insulin signalling and blocks the translocation of GLUT-4 transporters to the cell surface, effectively preventing glucose uptake (Samuel and Shulman, 2012).

3.2 Effect of high-fat diet and STZ on total cholesterol

Serum total cholesterol levels were significantly (p<0.01) elevated in HFD–STZ–treated rats compared to normal controls (Table 2). A progressive increase in cholesterol concentration was observed from day zero to day 28, with the highest levels recorded in extended diabetic rats. The rise in cholesterol may be attributed to insulin resistance– induced impairment of lipid metabolism, decreased lipoprotein lipase activity, and increased hepatic cholesterol synthesis. Hypercholesterolaemia contributes to lipotoxicity and accelerates both myocardial and renal damage under diabetic conditions, supporting earlier observations reported by Tam et al. (2024).

The observed lipid metabolic dysregulation in experimental diabetes has been attributed primarily to high-fat diet–induced insulin resistance and impaired hepatic insulin signalling. Under these conditions, insulin fails to effectively suppress hepatic synthesis and secretion of very-low-density lipoproteins (VLDL), leading to elevated circulating cholesterol and triglycerides (Brito et al., 2025). Furthermore, the combined influence of high-fat feeding and streptozotocin-induced insulin deficiency disrupts lipid homeostasis, resulting in increased low-density lipoprotein (LDL) and VLDL levels along with a reduction in high-density lipoprotein (HDL) cholesterol. Such alterations contribute to the development of an atherogenic lipid profile commonly reported in untreated diabetic animal models (Wickramasinghe et al., 2022).

In the HFD+STZ model, hypercholesterolaemia occurs because the lack of effective insulin inhibits Lipoprotein Lipase (LPL) activity, preventing the clearance of cholesterol-rich lipoproteins from the blood. Simultaneously, the insulin-resistant liver fails to suppress HMG-CoA reductase, leading to continuous endogenous cholesterol synthesis despite high dietary intake. Furthermore, the conversion of cholesterol into bile acids is blocked, resulting in significant systemic accumulation of total cholesterol (Goldberg et al., 1996).

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3.3 Effect of high-fat diet and STZ on serum triglyceride concentration

Serum triglyceride concentrations showed a significant (p<0.01) (Figure 2) and time-dependent increase in HFD– STZ–treated rats compared to normal animals. Triglyceride levels rose sharply following STZ administration and continued to increase up to day 28 in extended diabetic rats. This elevation reflects enhanced lipolysis, increased hepatic triglyceride synthesis, and reduced peripheral lipid utilisation due to insulin deficiency and resistance. Elevated triglycerides are known to exacerbate oxidative stress and inflammatory responses, thereby contributing to the progression of diabetic cardiomyopathy and nephropathy. Tam et al. (2024).

Group	Before the administration of HFD	On the day of administration of STZ (Day zero)	Day 4	Day 14	Day 28
Normal animals (Group I)	52.1425±4.28^{aA}	56.23+4.25^{aA}	57.18±4.69^{aA}	57.23±4.43^{aA}	59.85±4.23^{aA}
Animals fed with HFD and STZ (Group II)	52.1425±4.87^{aA}	72.83±3.14^{bB}	95.38±4.23^{cB}	125.57±5.9^{dB}	
Animals fed with HFD and STZ (Group II) were extended till 28th day	54.65±8.06^{aA}	95.19±17.52^{bC}	97.88±5.42^{cB}	166.63±37.42^{dC}	170.015±22.04^{dB}

Table 2: Effect of high-fat diet and streptozotocin on the total cholesterol level of rats

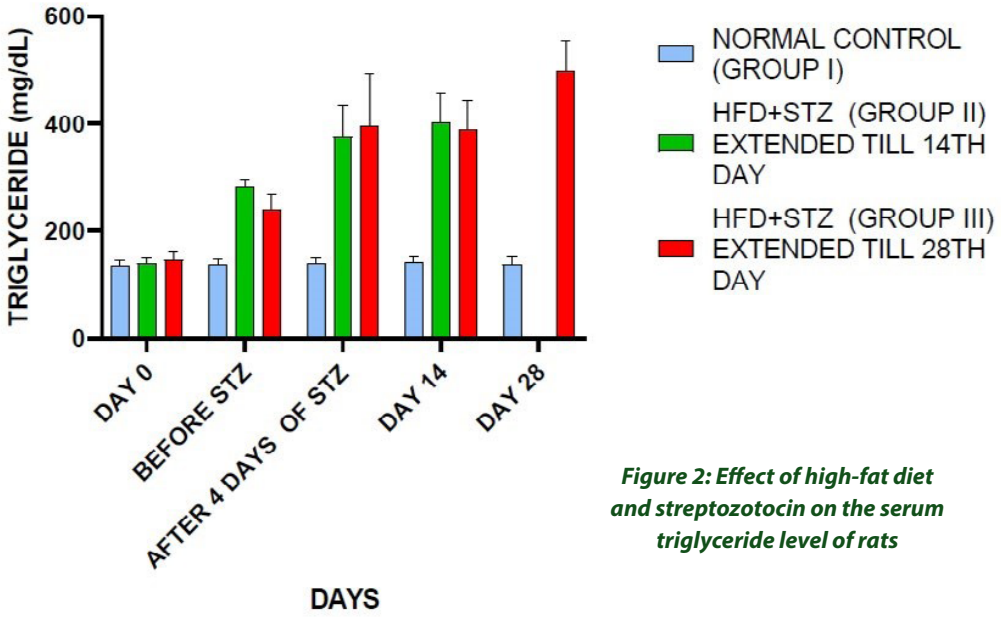


Figure 2: Effect of high-fat diet and streptozotocin on the serum triglyceride level of rats

Hypertriglyceridemia in HFD–STZ–induced diabetes is primarily attributed to insulin resistance–related disturbances in lipid metabolism. Defective insulin action impairs triglyceride clearance, enhances lipolysis in adipose tissue with increased free fatty acid flux, and stimulates hepatic triglyceride synthesis, collectively leading to elevated circulating triglyceride levels (Lewis et al., 2002). Moreover, the synergistic effect of high dietary lipid intake and streptozotocin-induced β-cell dysfunction markedly disrupts lipid homeostasis, producing a dyslipidemic profile that closely resembles the metabolic abnormalities characteristic of human Type 2 diabetes.

In the HFD+STZ-induced diabetic state, hepatic insulin resistance triggers an upregulation of Microsomal Triglyceride Transfer Protein (MTP), stimulating the overassembly and secretion of large, triglyceride-dense VLDL particles. This process is further exacerbated by a continuous influx of free fatty acids derived from both dietary intake and accelerated adipose tissue lipolysis, providing an abundant substrate for hepatic triglyceride synthesis (Adiels et al., 2008).

3.4 Effect of high-fat diet and STZ on blood urea nitrogen (BUN)

Blood urea nitrogen levels were significantly (p<0.01) increased in HFD–STZ–treated rats compared to normal controls. BUN levels showed a progressive rise from day 4 onwards, with maximum values observed on day 28 in extended diabetic animals. The elevation in BUN indicates impaired renal excretory function and increased protein catabolism associated with chronic hyperglycaemia. These findings confirm the onset and progression of diabetic nephropathy, in agreement with previous reports by Hao et al. (2012).

Elevated blood urea nitrogen (BUN) levels in HFD– STZ–induced diabetes are indicative of compromised renal function and progressive nephropathic changes. Chronic hyperglycaemia promotes glomerular injury through oxidative stress and inflammatory mechanisms,

leading to impaired renal filtration and reduced urea excretion. Consequently, the accumulation of nitrogenous waste products in the circulation reflects declining renal clearance, a feature commonly reported in experimental diabetic nephropathy models (Al-Qabbaa et al., 2023).

3.5 Effect of high-fat diet and STZ on serum creatinine concentration

Serum creatinine levels were significantly (p<0.01) elevated in diabetic rats fed with HFD and STZ (Table 3) when compared to normal animals. A gradual increase in creatinine concentration was observed from day 4 to day 28, suggesting a reduction in glomerular filtration rate due to glomerular and tubular damage. Normal control rats showed no significant changes in creatinine levels throughout the study. The observed rise in serum creatinine further substantiates the development of renal dysfunction in diabetic rats, as reported by King (2012).

Elevated serum creatinine levels in HFD–STZ–induced diabetes are indicative of impaired renal filtration and progressive nephropathic alterations. Chronic hyperglycaemia induces oxidative stress–mediated damage and structural changes in both glomerular and tubular compartments, resulting in reduced creatinine clearance and its subsequent accumulation in the circulation. Similar increases in serum creatinine have been consistently reported in experimental diabetic models, supporting its utility as a reliable biochemical marker for the progression of diabetic nephropathy and declining renal function (Tesch and Allen, 2007).

In the HFD+STZ model, persistent hyperglycemia triggers the intrarenal renin-angiotensin-aldosterone system (RAAS), causing efferent arteriolar constriction and subsequent glomerular hyperfiltration. This increased mechanical pressure eventually induces podocyte damage and basement membrane thickening, leading to glomerulosclerosis. Consequently, the reduction in functional glomerular surface area impairs the kidney's filtration capacity, resulting in the systemic accumulation of serum creatinine (Ziyadeh, 1993).

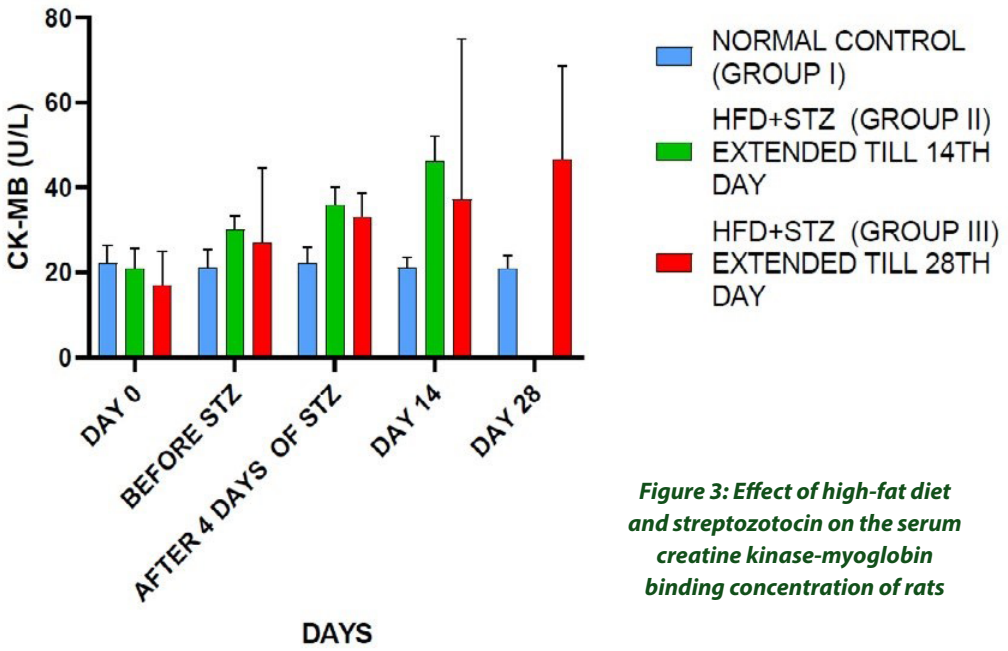


Figure 3: Effect of high-fat diet and streptozotocin on the serum creatine kinase-myoglobin binding concentration of rats

Group	Before the administration of HFD	On the day of administration of STZ (Day zero)	Day 4	Day 14	Day 28
Normal animals (Group I)	83.15±4.18^{aA}	85.15±3.25^{aA}	82.24±4.59^{aA}	83.43±4.49^{aA}	85.03 +3.23^{aA}
Animals fed with HFD and STZ (Group II)	84.15±4.87^{aA}	122.69±20.92^{bB}	185.48±22.23^{cB}	264.37±24.05^{dB}	
Animals fed with HFD and STZ (Group II) were extended till 28th day	88.57±7.45^{aA}	141.22±11.52^{cC}	171.505±5.57^{cB}	205.63 +10.42^{eC}	295.99 +29.51^{eB}

Table 3: Effect of high-fat diet and streptozotocin on the blood urea nitrogen level of rats

3.6 Effect of high-fat diet and STZ on creatine kinase– myoglobin binding (CK-MB)

Serum creatine kinase–myoglobin binding (CK-MB) levels were significantly (p<0.01) elevated in HFD–STZ–treated rats compared to normal controls (Table 4 and Figure 3). CK-MB levels increased progressively with the duration of diabetes, with the highest values recorded in extended diabetic rats.

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Elevated CK-MB reflects myocardial cell membrane damage and leakage of cardiac enzymes into circulation, indicating the presence of diabetic cardiomyopathy. These findings are consistent with earlier studies demonstrating myocardial injury in experimental diabetic models (Youssef et al., 2022). Elevated creatine kinase–MB (CK-MB) activity in HFD– STZ–induced diabetes reflects hyperglycaemia-mediated myocardial injury. Sustained hyperglycaemia enhances glucose flux into cardiomyocytes, leading to excessive generation of reactive oxygen species through mitochondrial dysfunction, increased polyol pathway activity, and accelerated formation of advanced glycation end products.

The resulting oxidative stress promotes lipid peroxidation of cardiomyocyte membranes, increasing membrane permeability and facilitating the release of CK-MB into the circulation (Ansley and Wang, 2013). In parallel, activation of IKK-dependent NF-κB signalling amplifies inflammatory and profibrotic responses, contributing to cardiomyocyte apoptosis, hypertrophy, and progressive cardiac dysfunction. Such mechanisms collectively underpin the elevation of CK-MB as a sensitive biochemical indicator of diabetes associated myocardial damage. In the HFD+STZ model, persistent hyperglycemia promotes the formation of advanced glycation end-products (AGEs) and reactive oxygen species, leading to oxidative damage of the cardiac sarcolemma. This loss of membrane integrity allows the leakage of the intracellular CK-MB isoenzyme into the systemic circulation, serving as a definitive marker of myocardial injury and diabetic cardiomyopathy (Cai and Kang, 2003) in rats.

3.7 Effect of high-fat diet and STZ on body weight

Normal control rats exhibited a gradual increase in body weight throughout the experimental period. In contrast, HFD–STZ–treated rats (Table 5) showed an initial increase in body weight following HFD feeding, followed by a significant (p<0.01) reduction after STZ administration. Progressive weight loss was evident by day 14 and day 28, despite persistent hyperglycaemia. This reduction in body weight may be attributed to enhanced proteolysis, lipolysis, and impaired glucose utilisation, reflecting systemic metabolic dysfunction associated with diabetes (Tam et al., 2024).

Group	Before the administration of HFD	On the day of administration of STZ (Day zero)	Day 4	Day 14	Day 28
Normal animals (Group I)	0.27±0.01^{aA}	0.27±0.03^{aA}	0.26±0.02^{aA}	0.27±0.01^{aA}	0.27±0.01^{aA}
Animals fed with HFD and STZ (Group II)	0.27±0.03^{aA}	0.393±0.044^{bB}	0.51±0.033^{cB}	0.64 +0.11^{cB}	
Animals fed with HFD and STZ (Group II) were extended till 28th day	0.21±0.02^{aA}	0.28±002^{aA}	0.35±0.34^{cC}	0.46 +0.06^{cC}	0.4 +0.03^{cB}

Table 4: Effect of high-fat diet and streptozotocin on the serum creatinine concentration of rats

Body weight alterations in HFD–STZ–induced diabetes are primarily attributed to insulin deficiency–and insulin resistance–associated metabolic disturbances. Impaired insulin action promotes enhanced proteolysis and lipolysis, leading to negative energy balance and progressive weight loss despite adequate nutritional intake.

Similar reductions in body weight have been consistently reported in streptozotocin-induced and HFD–STZ diabetic models, reflecting disrupted metabolic regulation and increased catabolic activity characteristic of experimental Type 2 diabetes (Huang et al., 2024).

Consistent with the findings of Akbarzadeh et al. (2007), rats rendered diabetic with streptozotocin showed a marked decline in body weight when compared to non-diabetic controls. This reduction may be attributed to insulin deficiency–induced metabolic disturbances, leading to enhanced breakdown of proteins and lipids and loss of body mass.

In the HFD+STZ model, an initial increase in body weight during the HFD phase is followed by a significant decline post-STZ administration. This weight loss is driven by the depletion of fat and muscle stores through accelerated catabolism and the massive loss of calories and fluids through glucose-induced osmotic diuresis (Srinivasan et al., 2005)

Group	Before the administration of HFD	On the day of administration of STZ(Day zero)	Day 4	Day 14	Day 28
Normal animals (Group I)	152.5±4.28^{a}	161.5±4.25^{b}	148.23±3.69^{a}	162.48±2.43^{b}	168.32±3.21^{b}
Animals fed with HFD and STZ (Group II)	156.5±4.66^{a}	310.25±16.23^{b}	305.25±16.23^{b}	277.25±13.76^{c}	
Animals fed with HFD and STZ (Group II) were extended till 28th day	176.5±10.15^{a}	318±30^{b}	306.25±30.11^{b}	272±13.27^{c}	238.5±4.03^{d}

Table 5: Effect of high-fat diet and STZ on the body weight of rats

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4. CONCLUSION

The present investigation demonstrated that high-fat diet feeding significantly aggravated metabolic derangements and accelerated the progression of cardiac and renal dysfunction in streptozotocin-induced diabetic rats. Persistent hyperglycaemia, progressive dyslipidaemia, and marked body weight reduction reflected severe metabolic imbalance. Significant elevations in blood urea nitrogen, serum creatinine, and CK-MB substantiated the development of diabetic nephropathy and cardiomyopathy. The progressive deterioration observed from day 14 to day 28 indicated time-dependent exacerbation of target organ damage under sustained hyperglycaemic conditions.

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Yarns – Part 5 of 10

by Jay Malherbe

Sheep Killer

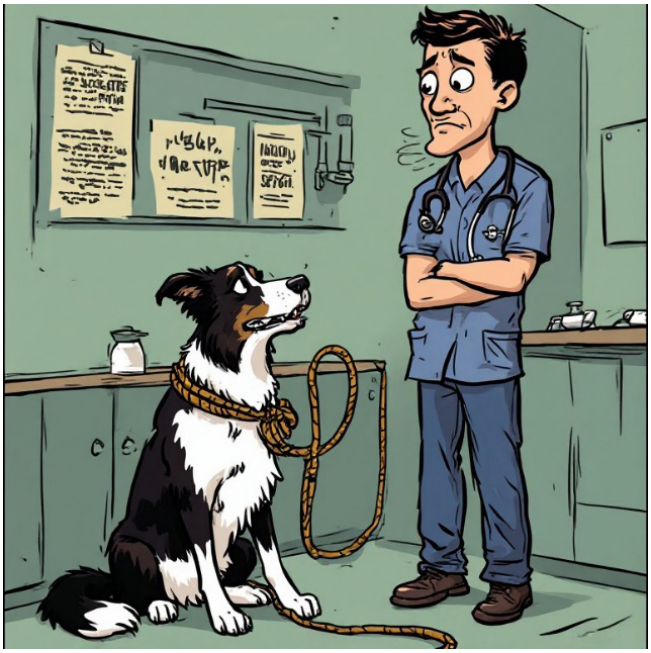
I was at my first practice since leaving the state service. It was lunchtime, and I was alone at the clinic, along with my assistant, Christopher. The receptionist had popped out somewhere.

In came a farmer I knew, along with a couple of farm hands bringing in a large black and white dog with two different coloured eyes, one of them a blue-white. The dog had been caught killing a sheep. This is a mortal sin on a sheep farm. No second chance. Euthanasia was the only sentence. At least this farmer didn't want to shoot the poor dog himself, so it was brought to the vet to do the deed.

The labourers left the dog up on the consulting room table where it lay calmly held by Christopher. The farmer was quite upset, so he and his men left in a hurry, as I drew up the solution into a syringe to do the deed. I was young, confident and a bit careless in that I didn't bother to put a muzzle on the dog, as it seemed so calm.

As I put the needle into its leg to find the vein, the dog erupted. Christopher was bitten, and it flew off the table in fury to get at Christopher, who was out of the door in a flash, slamming the door behind himself. I was now alone in the room with a furious dog, now coming for me. In one leap, I was standing on the consulting table with a snarling dog patrolling around below me. From my vantage point on the table, I could see the farmer's truck going off down the road.Christopher had run around the building and was now peering in through the window.

A digression here. My boss, the senior vet, had for a while worked in Canada. He had been taught to use and throw a rope, and so was able to lasso animals. Anyone who worked for him was expected to be able to use a lariat. We each carried one of these stiff ropes in our vehicles, and I considered myself quite good at throwing a rope.



I shouted to Christopher to fetch the rope from the van, which he managed to get to me through the window that I had opened by jumping across to the counter.

After a few tries, I managed to get the rope around the very irate dog's neck. I then threw the end of the rope to Christopher over the slightly open door.

After securing the dog, we managed to complete our grim task and then tend to Christopher's hand, which luckily only had a minor wound.

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Letter from Dr Tod Collins

Dear Madam Dr President, Committee Members of the SA Veterinary Association, Awards Committee, and donors to the Tod Collins Back-a-Buddy Fund.

I am relieved that this is email correspondence and not an old-fashioned pen-on-paper, let alone face-to-face form of communication. That's because you would see the tears slipping down my cheeks or notice the blotched ink. I'm an emotional bloke.

You might know that I have produced seven books, and the manuscript of the eighth is with the publishing house. Also, I tend to voice my opinion on various platforms. So in Olde English I could be referred to as A Man of Letters. Yet in trying to pen, find the right words for this letter, I feel at a complete loss. I'll try.

FIRST: The honour bestowed in presenting me with The President's Medal for service to, and advancement of, our profession is overwhelming! I really am merely the product of many, many people who have influenced, guided and moulded me along my life's pathway … since childhood, I suppose. Four have been men in the profession named Peter!

Drs Wacher of Howick, Harte of Queenstown, Collier (my boss-partner-best friend of 26 years in Underberg) and Ardington (was Zululand, now Howick, and also a former recipient of The President's Medal.)

However, I reckon the folk who most helped me during my malleable years were OP Professors Hofmeyr, Loveday, Couborough, and Jansen. Amongst others.

Thus it is on behalf of all these (and many unmentioned in this screed) that I accepted the award at the RuVASA Congress.

Mind you, through this roller-coaster of life, two have stuck with me from the dark, slimy pits of depression to the highs of delivering a bonny calf in a crisp autumn morning … and they are my wife Trish, and of course our Great Lord God, Father, and Creator of just about everything.

I am most fortunate to be needed and available to continue serving the livestock industry as a vet and consultant; mostly for the communal farmers in and around my home region.

This I do under the aegis of our Underberg Farmers' Association as part of its developmental outreach initiative.

SECOND: During my course of chemotherapy for metastatic mesothelioma, I needed afternoon zizzes (siestas!) It was during one of these that an expert fraudster woke me and bamboozled my brain with these tricksters' clever tactics. The next thing, all the funds in my various banking and savings accounts were gone.

Funds to cover the extra medical expenses, my book publishing and printing, the term's school fees for a fostered orphan,… and should my health and funds permit it, a final trip to Nepal to visit and stay with a Sherpa buddy. I had dreamed that from his home (slightly off the beaten track en route to Everest Base Camp) of following my lesser-known passion, birdwatching!

For twitchers, or fellows like me who simply love to quietly sit on grassy hillsides, or in forest glades and check out God's jewels-with-feathers, Nepal is a most underappreciated birding destination.

Yet the next thing I knew, a Back-a-Buddy Fund had been set up, and in no time the full amount of what I had been defrauded had been donated; either with donors' names or anonymously. I was and still am totally bowled over!

Where possible, I am slowly working my way through contacting the named sponsors/donors to say huge thanks. And I hereby write this enormous, HEARTFELT thanks to you nameless guys and gals; and of course the Fund Trustees.

I have ceased chemo and am continuing on a ketogenic diet; a weekly 24-hour fast (electrolytes and water only) and a monthly 72-hour fast; ivermectin and fenbendazole. And extra Vits C and D. (I have read of, and am urged to follow, a wide number of other wúnder-remedies.)

Often it is very tough, but my intention is to put a smile on at least one other human's face every day. One receives a crockful of those motivational WhatsApps every day, but yes, by trying to lift somebody else, you lift yourself up simultaneously. Honestly!

With respectful and kindest regards,

Tod

South African Veterinary Association
Suid-Afrikaanse Veterinêre Vereniging

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

South African Veterinary Association
Suid-Afrikaanse Veterinêre Vereniging



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


SAVA
South African Veterinary Association

"..to use our professional knowledge, skills and resources to protect and promote the welfare of animals and humans.."

Mission

The South African Veterinary Association aims to serve its members and to further the status and image of the veterinarian. We are committed to upholding the highest professional and scientific standards, and to utilising the professional knowledge, skill and resources of our members, to foster close ties with thecommunity and thus promote the health and welfare of animals and mankind.

Tel:+27(12)3461150/1, www.sava.co.za, vethouse@sava.co.za

SAVA Community Veterinary Clinics (SAVA-CVC)

A project of theSAVA which aims to provide primary healthcare to pets owned by owners who cannot afford the services of a veterinarian. Various clinics have been established countrywide. Veterinarians donate their time and skill. Financial support is required, primarily to purchase medication and materials. Registered non-profit company(1998/016654/08) non-profit organisation (000-234NPO) and public benefit organisation(130001321)

Tel:+27(12)3461150/1, www.communityvet.co.za, cvc@sava.co.za

South African Veterinary Foundation (SAVF)

The foundation was established to promote a greater understanding of animals, through promoting research and an informed public. Student bursaries and research grants are awarded; research results are published in national and international journals.

www.savf.org.za, savf@sava.co.za

South African Veterinary Council (SAVC)

The SAVC is the regulatory body for the veterinary profession and veterinary para-professions in South Africa.

Tel:+27(12)3456347,www.savc.org.za,savc@savc.org.za

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www.daff.gov.za→Branches→ Agricultural Production,Health and FoodSafety → AnimalHealth→ Import/Export Policy Unit→(application forms can be found here)

South African Veterinary Association
Suid-Afrikaanse Veterinêre Vereniging

VISION AND MISSION STATEMENTS

Vision:

To be the leading voice of veterinarians, advancing excellence, integrity, and impact for South Africa's veterinary profession.

Mission:

To unite and advance the veterinary profession through collaboration, excellence, and advocacy, promoting integrity, sustainability, and impact in animal health and welfare, public health, food security, and community well being.

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In Memoriam

Dr Zoleka Ntondini
1971– 2026

In Loving Memory of Dr Zoleka Ntondini-Sontshi

The South African Veterinary Association (SAVA) mourns the passing of Dr Zoleka Ntondini-Sontshi, a dedicated veterinary professional, respected public servant and valued member of the South African veterinary community, who passed away on 24 September 2026 at the age of 55. Her passing is a profound loss to all who knew her.

Born on 20 April 1971 in Matatiele, Eastern Cape, Dr Ntondini-Sontshi began her educational journey in the Eastern Cape, matriculating at Mariazel Senior Secondary School. She subsequently obtained a Bachelor of Science degree in Botany and Zoology from the then University of Transkei, followed by a Bachelor of Veterinary Science degree from the Medical University of Southern Africa (MEDUNSA), now known as Sefako Makgatho Health Sciences University (SMU). Her pursuit of academic excellence continued at the University of Pretoria, where she completed a Master of Science degree through the Faculty of Veterinary Science.

Earlier in her career, she served as a Research Veterinarian in Research and Ethics at the National Council of Societies for the Prevention of Cruelty to Animals (NSPCA), reflecting the breadth of her professional interests and her commitment to animal welfare. Having worked with her during this period, one can attest to this commitment.

Her professional career, however, was largely dedicated to serving the people and agricultural communities of the Eastern Cape through the provincial Department of Agriculture. Her leadership and management roles in the Joe Gqabi and Chris Hani Districts endeared her not only to the farmers and communities she served, but also to her colleagues. Her ability to fulfil these responsibilities with distinction demonstrated that her capabilities extended far beyond her technical expertise as a veterinarian. She possessed exceptional skills in people management, financial oversight and operational leadership, reflecting her versatility, sound judgement and commitment to effective public service delivery. Many fond anecdotes have been shared about her "tough love" approach to performance management, balancing high standards and accountability with fairness, compassion and positive working relationships.

At the time of her passing, Dr Ntondini-Sontshi held the position of Senior Manager: Animal Health within the Veterinary Services Chief Directorate of the Eastern Cape Department of Agriculture, while also serving as Acting Chief Director: District Coordination. These senior responsibilities were a testament to her extensive experience, leadership capabilities and the confidence placed in her ability to coordinate and deliver essential public services. Despite enduring health challenges during this period, she remained steadfast and resilient in her commitment to serve.

Her engaging personality, strong technical expertise and exceptional leadership abilities enabled her to successfully manage various animal disease outbreaks across the Eastern Cape. She understood that effective disease prevention and control required more than technical interventions; it demanded collaboration, coordination, trust and the active participation of diverse stakeholders.

Through her ability to build meaningful relationships and mobilise collective action, she successfully brought together farmers, commodity organisations, corporate stakeholders, government departments and agencies in coordinated disease control efforts. Her inclusive and collaborative leadership reflected not only her sound understanding of veterinary epidemiology and disease management, but also her remarkable ability to unite people around a common goal: safeguarding animal health, protecting livelihoods and supporting the sustainability of the agricultural sector.

Beyond her considerable professional accomplishments, Zoe will be remembered just as fondly for the remarkable woman she was. She was a dedicated and loving mother, a much-loved sister by her siblings and cherished friend. She was a woman of deep faith, warmth and genuine connection; someone who embraced life with enthusiasm, appreciated its finer things and brought joy to those around her through her infectious laughter, lively conversations and engaging personality.

She valued her relationships, cherished life's experiences and approached both her personal and professional pursuits with curiosity and enthusiasm. Her love of learning, openness to new experiences and desire for personal growth remained defining qualities throughout her life. She understood the importance of both purposeful service and living life fully.

Her passing reminds us that the veterinary profession is shaped not only by the knowledge, expertise and dedication of its members, but also by the humanity, compassion, relationships and friendships we bring to our work. While her professional achievements are worthy of recognition, it is equally the warmth of her personality, the connections she nurtured and the lives she touched that will remain part of her enduring legacy.

Dr Ntondini-Sontshi's contribution to veterinary services is worth emulating, particularly within the public sector, as it leaves a legacy of committed leadership, professional excellence and service to animal health, agriculture and the communities that depend on them.

As we honour her memory, we celebrate a life dedicated to learning, service, faith and family. May those who knew and loved her find comfort in the memories they shared and in the lasting impact of her life.

Rest in eternal peace, Zoe. Your life was a gift to those who knew you. You made us so proud, and your contribution to the veterinary profession will be remembered with deep gratitude, affection and respect.

On behalf of the SAVA Board, leadership and members, we extend our heartfelt condolences to her husband, Zolile Sontshi, her children, parents, siblings, extended family, friends and colleagues. V

Ziyanda Majokweni – Qwalela

In Memoriam

Dr Nicola IgnatiusToich
1944 – 2026



Nicola, known as Nic, was born in Pretoria to parents Peter and Agnes, and he had 4 brothers and 4 sisters. Nic's grandparents had immigrated to South Africa from Croatia. Nic's schooling was at Christian Brothers College (CBC), first in Pretoria until Standard 8 and then in Kimberley to matriculation. His university education was in Cape Town (UCT) and then Pretoria, where he graduated BVSc in 1971 at Onderstepoort.

After a short spell as an assistant at the Benoni Veterinary Hospital, he became a partner in 1974 with Derek Etherington, Michael Jonker and Errol Chivers. He subsequently bought the partners out to become sole owner in 2000.

The practice has expanded under his leadership to provide a comprehensive service to animal owners in Benoni dating back over 70 years.

Nic and Monica were married in 1971 and had 2 daughters and 5 sons, the youngest being Joseph Anton, who qualified BVSc in 2013 and took over the practice when Nic retired in 2014.

Dr Toich senior was a lifelong member of SAVA, and he also had interests in butcheries and was a well-known breeder of Bulldogs, some being sold in America. The Toich family were great supporters of veterinary students, making their large station wagon available to the soccer team to attend away matches, donating equipment and also providing the team with a hearty meal after matches.

Dr Nicola Toich was highly regarded by the community of animal owners whom he served for over 40 years.

His kindness and compassion to animals in his care will be gratefully remembered. V

Gareth Bath



In Memoriam

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

Dr Clive McDonald: 1945– 2026

Dr Fred van der Linde: 1960– 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

STAYING FOCUSED WHEN RUNNING ON FUMES



Dr Mats Abatzidis

B.Sc. B.V.Sc.

New Insights Certified VIP Life Coach
mats.abatzidis@yahoo.co.za
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http://www.life-coach-directory.co.za/mats-abatzidis

Greetings, everyone, and I hope everyone is enjoying the warmer weather! As a life coach who has spent the last 14 years working with high-achievers, I have noticed a recurring annual phenomenon. Around November, a collective, heavy sigh ripples through the professional world. But in private veterinary practices, that sigh is usually accompanied by the sound of a golden retriever eating a tinsel garland and a phone ringing off the hook with clients demanding "squeeze-in" appointments before they travel. By the time the year-end rush hits, veterinary teams are not just tired—they are operating on absolute fumes. When your brain is entirely occupied by visions of beach chairs, sleeping past 6:00 AM, or simply not smelling like anal glands for 48 consecutive hours, staying focused on clinical precision feels like trying to herd a room full of highly caffeinated kittens.

Whether you are counting down the minutes until your December leave, or you are part of the brave, skeleton crew working straight through the holiday period, here is your practical, slightly cheeky, survival guide to keeping your focus and sanity intact.

Scenario A: **The "December Leave is My Sanity" Group**

Your bags are packed in your mind, your physical body is still holding a thermometer, and you are vibrating with holiday anticipation. When the finish line is so close you can taste the eggnog, the temptation to "mentally check out" is incredibly high. However, distraction in surgery or diagnostic work is a recipe for a very stressful holiday. To keep your eyes on the patient rather than the calendar, try these three strategies:

1. "Eat the Frog" Before the Coffee Gets Cold: In a busy clinic, task-switching is a silent energy thief. Your brain has to work twice as hard to refocus every time you are interrupted. Make a deal with yourself: identify your most dreaded, brain-heavy task of the day—be it that complicated surgical prep, the dense diagnostic review, or calling back that notoriously difficult client—and do it first thing in the morning. Once your "frog" is eaten, the rest of the day feels infinitely lighter.

2. Put Your Mind on "Pomodoro Sprints": When 10-hour shifts feel like an eternity, stop looking at the clock. Break your day into bite-sized, manageable intervals. Try using the Pomodoro Technique for your administrative tasks: spend 25 minutes completely focused on completing medical records, typing up chart notes, or clearing out your inbox, and then reward yourself with a strict 5-minute break to stretch, grab water, or look at memes of animals doing silly things. Knowing a break is only 25 minutes away keeps your wandering mind anchored to the task at hand.

3. Pack Your Professional Baggage (Literally): Veterinary medicine is highly emotional, and carrying the weight of the clinic home makes it impossible to recharge. Try a mental closure exercise before you walk out the door. Visualise your day's difficult moments, incomplete tasks, and clinical worries. Mentally place them into a heavy cardboard box, tape it shut, and leave it right on your clinic desk. You can open it when you get back, but for tonight, you travel light.

Scenario B: The "Working Through the Holidays" Brigade

You are holding down the fort while the rest of the world opens presents. Your clinic is quiet—or unexpectedly chaotic—and the FOMO (Fear Of Missing Out) is real. If you are working through the holiday block, it is easy to feel forgotten. But with a shift in perspective, working this period can actually be a uniquely rewarding, low-stress experience. Here is how to conquer the holiday shift:

1. Execute a Tactical "Dopamine Upgrade": Elevate the daily experience! Establish high-value, festive rituals with your remaining skeleton crew. Declare "Gourmet Coffee Wednesdays," host a secret-Santa-style snack swap, or set up a clinic playlist where everyone gets to add their favourite feel-good tracks. Creating a warm, supportive, and slightly silly team culture multiplies your personal energy and makes the clinic feel like the place to be.

2. Protect Your Visual Diet: If you are already feeling low about working, scrolling through social media to see photos of your colleagues sipping cocktails on a beach is emotional self-sabotage. During your holiday shifts, put your personal phone in your locker. Restricting your exposure to other people's highlight reels protects your focus and keeps you present with the team and patients who genuinely need your energy.

3. Embrace the "Quiet-Shift" Advantage: Instead of viewing it as "just another work week," treat it as a golden opportunity to work at a gentler, more thorough pace. Take the extra five minutes to cuddle that sweet paediatric patient, organise that chaotic pharmacy drawer that has been bothering you since July, or sit down and actually enjoy your lunch break without checking the emergency door.

The Universal Life-Coach Prescription: Control the Controllables

We cannot control the chaos of the holiday pet rush, but we can control your response to it.

If you find yourself spiralling during a hectic shift, stop, take a slow breath, and ground yourself. Scan your immediate surroundings and name three things you can see, two things you can hear, and one thing you are grateful for in that exact moment.

You are doing vital, compassionate work. Be as kind to yourself this season as you are to the animals in your care. Now go wash your hands, grab a cookie from the breakroom, and take this year-end one shift at a time!

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

Feline tooth resorption: The radiograph determines the treatment

Prof Gerhard Steenkamp, Drs Michael Ferreira and Mareli van de Wetering

Tooth resorption is a common and potentially painful dental disorder in cats. Destruction usually begins on the root surface and may progress into the dentine and crown. A small defect at the gingival margin, sometimes obscured by inflamed tissue, may be the only visible sign. Conversely, substantial root resorption may be present beneath a clinically unremarkable crown. The oral examination alone cannot establish which roots can be extracted conventionally (AVDC 2019; Niemiec et al. 2026).

1. The AVDC classification in brief

Radiographic types. Type 1: focal or multifocal resorption with otherwise normal root radiopacity and a preserved periodontal ligament space. Type 2: replacement resorption, characterised by narrowing or disappearance of the periodontal ligament space and loss of root radiopacity as dental tissue is replaced by bone-like tissue. Type 3: Type 1 and Type 2 changes within the same tooth, sometimes affecting different roots.

Stages of destruction. Stage 1: mild loss of cementum, with or without enamel involvement; Stage 2: dentine involved, but not the pulp cavity; Stage 3: pulp cavity involved, with most of the tooth still intact; Stage 4: extensive destruction (4a, crown and root equally affected; 4b, crown more severely affected; 4c, root more severely affected); Stage 5: only irregular radiopaque remnants remain beneath complete gingival covering (AVDC, n.d.).

2. Ankylosis changes the surgical approach

Dentoalveolar ankylosis is direct fusion of the root to the alveolar bone where the periodontal ligament has disappeared. Even a relatively limited area of replacement resorption may result in ankylosis. At the ankylosed interface, conventional extraction by elevation is impossible: there is no periodontal ligament to sever and no separation plane.

Applying greater force does not overcome this fusion; it risks fracturing the root or damaging the surrounding alveolar bone.

The tooth can still be removed surgically, but this requires division of the ankylosed attachment using a bur and removal of alveolar bone as needed. The decision to undertake that surgery, rather than amputate the crown and retain the resorbing root, must therefore be made before attempting extraction.

3. Let the radiograph direct treatment

Preserved periodontal ligament and recognisable root anatomy (Type 1): extract the affected tooth completely. Crown amputation is not appropriate when a root with a recognisable periodontal ligament space remains (Fig. 1).

Replacement resorption with ankylosis (Type 2): where the periodontal ligament is no longer radiographically visible, crown amputation with intentional root retention is an appropriate option, provided there is no clinical or radiographic evidence of endodontic, periapical or periodontal pathology, or feline chronic gingivostomatitis (Fig. 2). The remaining crown tissue is removed 1–2 mm below the alveolar margin, and the gingiva is closed over the retained resorbing root (AVDC 2019; Niemiec et al. 2026).

Mixed appearance (Type 3): roots may require different approaches: extraction of the Type 1 root and crown amputation of the ankylosed Type 2 root, when the criteria for intentional root retention are met.

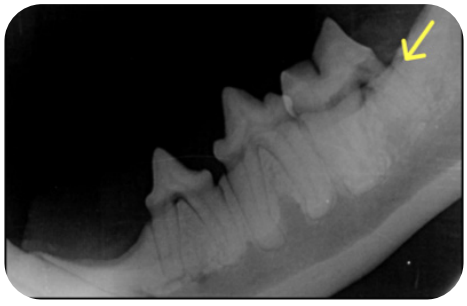


Figure 1. Type 1 resorption: preserved periodontal ligament space of the mandibular molar tooth (yellow arrow). Complete extraction is indicated for these types of lesions

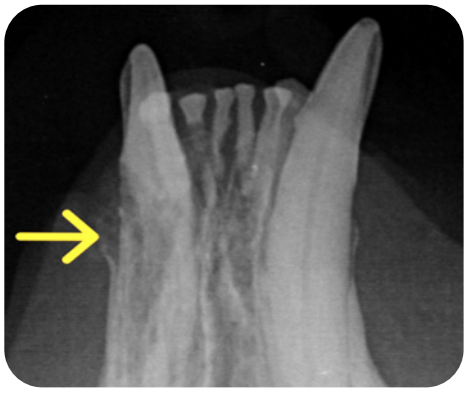


Figure 2. Type 2 replacement resorption with ankylosis on the mandibular canine tooth (yellow arrow). Crown amputation provided no associated pathology

If associated endodontic or periodontal disease is present, the diseased root tissue cannot simply be left behind. Surgical removal may require bur-assisted dissection of the ankylosed root and adjacent alveolar bone, guided and confirmed by dental radiographs.

4. Practical message

Obtain dental radiographs before treatment, ideally as part of a full-mouth radiographic examination, and obtain postoperative views to document extraction or intentional root retention, with periodic radiographic follow-up. **If the periodontal ligament persists, extract. If replacement resorption has resulted in ankylosis, do not attempt conventional elevation: consider crown amputation when the root is otherwise free of disease.** V

References:

American Veterinary Dental College (AVDC) (2019). Feline tooth resorption (TR). AVDC position statement. https://avdc.org/wp-content/uploads/2019/AVDC-pos-stmts/FORL_2019.pdf

American Veterinary Dental College (AVDC) (n.d.). AVDC nomenclature: tooth resorption. https://avdc.org/avdc-nomenclature/

Niemiec B, Gawor J, Nemec A et al. (2026). World Small Animal Veterinary Association Global Dental Guidelines. Journal of Small Animal Practice 67:859–987. https://doi.org/10.1111/jsap.70057



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Onderstepoort Veterinary Academic Hospital, Faculty of Veterinary Science, University of Pretoria,
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Fax: +27 (0) 12 529 8479
e-mail: sadent@mweb.co.za
website: www.vetdentsa.co.za
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A New Frontier in Gastroenterology: Faecal Microbiota Transplantation

This article is an adaptation of the original paper, "Fecal microbiota transplantation for GI disorders" by Linda Toresson, available on the Royal Canin Academy.

Faecal microbiota transplantation (FMT) is emerging as a powerful tool in veterinary medicine, offering new hope for dogs with a variety of acute and chronic gastrointestinal (GI) disorders. This technique, which involves transferring the intestinal microbiome from a healthy donor to a diseased recipient, aims to restore a balanced gut environment and alleviate disease. While the concept has ancient roots, its application in modern medicine is driven by our growing understanding of the crucial role the microbiome plays in overall health.

Efficacy in Acute and Chronic Conditions

FMT has demonstrated significant promise in several clinical scenarios. One of the most compelling applications is in puppies suffering from parvovirus enteritis. A randomised controlled trial showed that puppies treated with FMT in addition to standard care had significantly shorter hospitalisation and recovery times (a median of 3 days versus 6 days for the control group).

(Jergens AE, Schreiner CA, Frank DE, et al. A Scoring Index for disease activity in canine inflammatory bowel disease. J. Vet. Intern. Med. 2003;17(3):291-297. DOI:10.1111/j.1939-1676.2003.tb02450.x)

The benefits extend to dogs with other forms of acute diarrhoea. In one study, a single FMT was as effective as metronidazole in improving faecal scores by day 7. Crucially, at day 28, the FMT-treated dogs had a restored, healthy intestinal microbiome, whereas the metronidazole group exhibited significant dysbiosis.

(Chapman BC, Moore HB, Overbey DM, et al. Fecal microbiota transplant in patients with Clostridium difficile infection: A systematic review. J. Trauma Acute Care Surg. 2016;81(4):756-764. DOI:10.1097/TA.0000000000001195)

For dogs with chronic enteropathies (CE), including refractory cases of inflammatory bowel disease (IBD), FMT is proving to be a valuable adjunctive therapy. In a case series involving nine dogs with IBD unresponsive to conventional treatments like corticosteroids and cyclosporine, FMT led to a significant decrease in clinical disease activity scores. This improvement was linked to an increase in beneficial bacteria such as *Fusobacterium*, a key producer of short-chain fatty acids essential for gut health.

(AlShawaqfeh MK, Wajid B, Minamoto Y, et al. A dysbiosis index to assess microbial changes in fecal samples of dogs with chronic inflammatory enteropathy. FEMS Microbiol. Ecol. 2017;93(11). DOI:10.1093/femsec/fix136)

A larger retrospective study of 36 dogs with poorly responsive CE further supports these findings. All dogs in the study had failed to respond adequately to standard therapies. After receiving a series of FMTs, 75% of the dogs showed clinical improvement, manifesting as increased activity levels, better faecal consistency, weight gain, and improved appetite. Notably, some dogs were able to have their maintenance corticosteroid doses reduced. Side effects were uncommon and mild, typically limited to self-resolving diarrhoea or discomfort within 48 hours of the procedure.

Paramsothy S, Nielsen S, Kamm MA, et al. Specific bacteria and metabolites associated with response to fecal microbiota transplantation in patients with ulcerative colitis. Gastroenterology 2019;156(5):1440-1454.e2. DOI:10.1053/j.gastro.2018.12.001

The FMT Procedure: From Donor to Recipient

While formal, evidence-based guidelines are still under development by the Companion Animal Faecal Bank Consortium, a general protocol has been established through clinical experience.

Donor Selection: The success of FMT hinges on the quality of the donor. A suitable donor must be a clinically healthy adult with a normal body condition score and no history of chronic GI disease. They should not have received antibiotics for at least six months and should not be fed a raw food diet. Rigorous screening for intestinal parasites is essential. To ensure a rich and diverse microbiome, potential donors are often screened using a faecal dysbiosis index, which assesses the balance of key bacterial groups.

The Process: The transplant material can be fresh or frozen (thawed) faeces. A typical dose is around 5 grams of faeces per kilogram of the recipient's body weight (for dogs up to 30kg). For dogs over 30kg, 2- 3 g of faeces is used. The faeces are blended with sterile saline (20-120ml), filtered to remove particulate matter, and the filtrate is drawn into syringes, which should be left at room temperature or warmed in a water bath before use.

>>>47

The recipient is usually fasted for about six hours before the procedure (water is allowed) and walked for 30-40 minutes to encourage defecation. The transplant is administered rectally via a well-lubricated 12-16 FG catheter, with the tip reaching the level of the last rib. The procedure is well-tolerated by most dogs, though mild sedation may be used to ensure the animal remains calm. Post-procedure, exercise and food are restricted for 4-6 hours to maximise the contact time between the new microbiota and the recipient's colonic mucosa. For chronic conditions, a series of three transplants at 10- to 20-day intervals is often recommended for a lasting effect.

Conclusion

Faecal microbiota transplantation represents a significant advancement in small animal gastroenterology. It is a safe and effective adjunctive therapy that can reduce disease severity, improve quality of life, and in some cases, decrease reliance on long-term medications like corticosteroids and antibiotics. As research continues and protocols become more standardised, FMT is poised to become a mainstream treatment for a wide range of GI disorders in our companion animals.

To read the full article and for full references, please visit

https://academy.royalcanin.com/en/veterinary/fecal-microbiota-transplantation-for-gi-disorders

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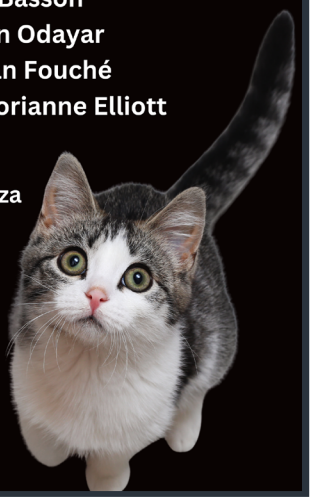
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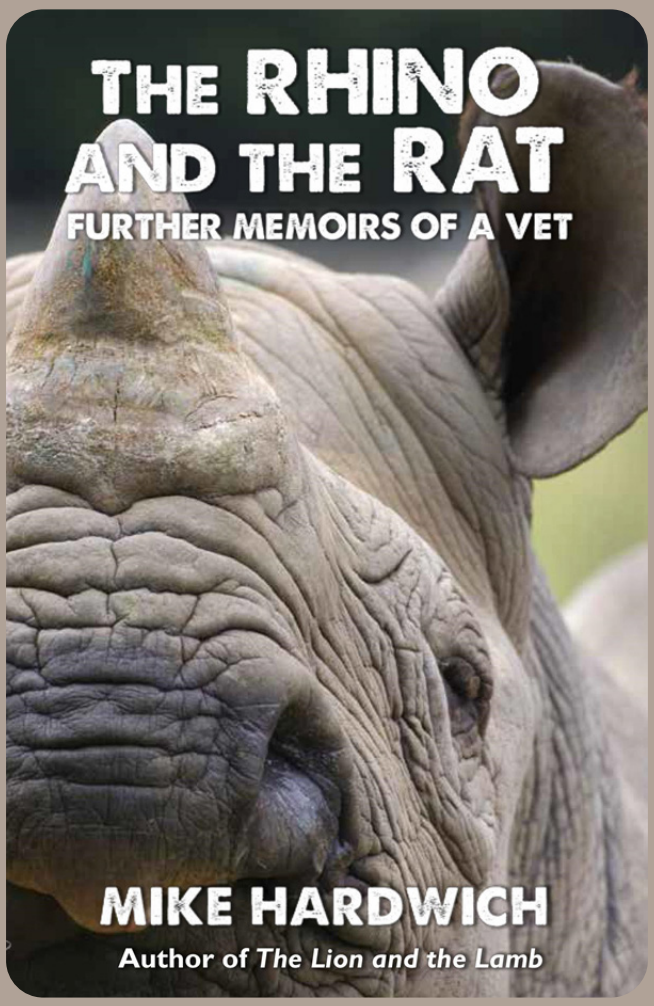
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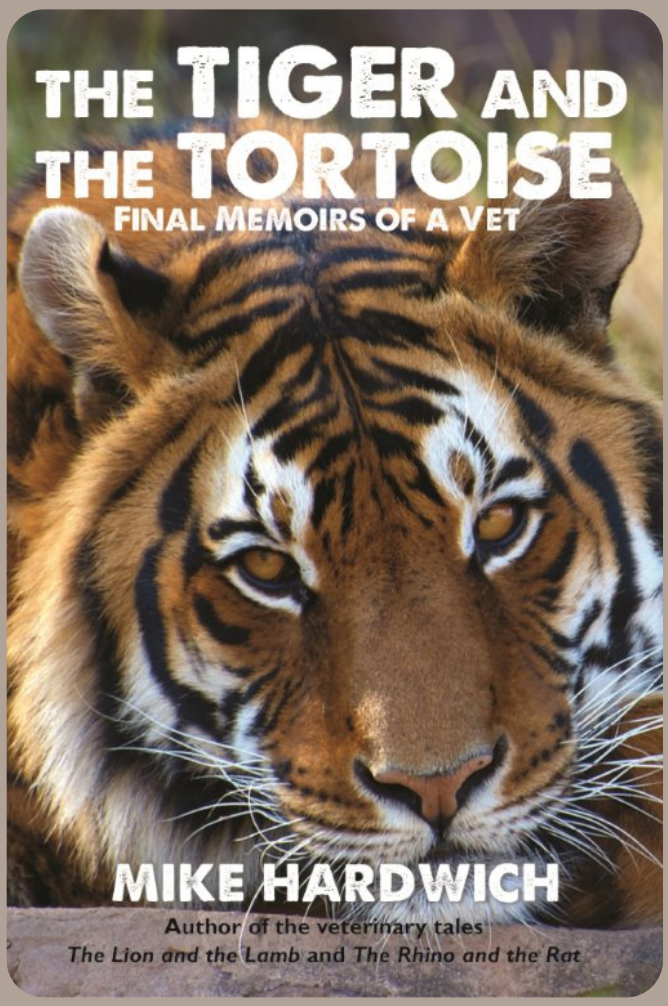
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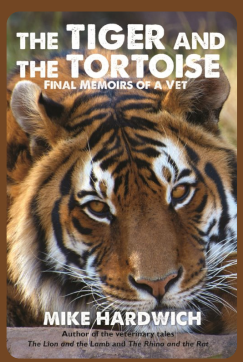




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