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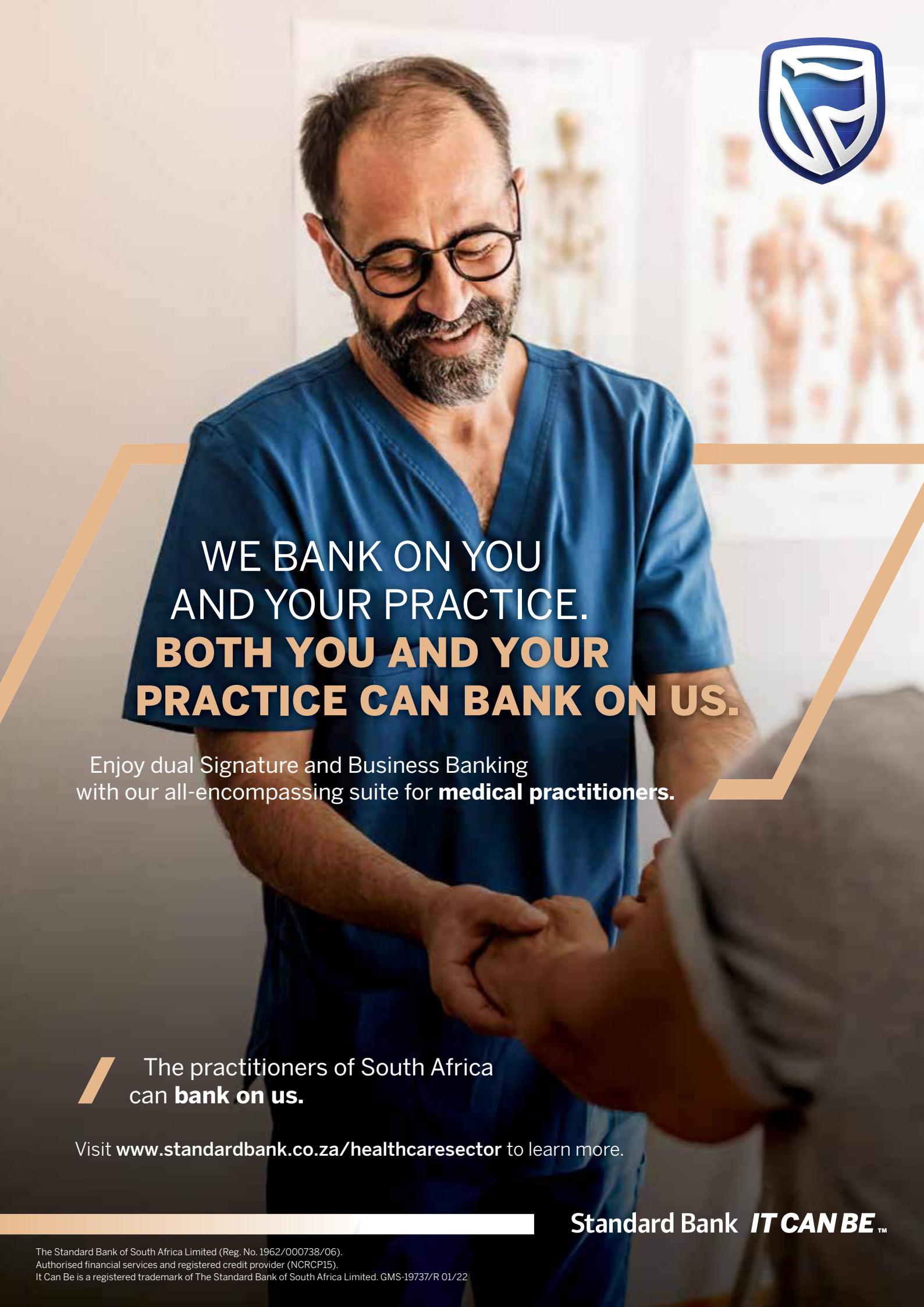

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- South African Association of Community Pharmacist Sector of the PSSA
- SA Association of Hospital and Institutional Pharmacists
- SA Association of Pharmacists in Industry

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S Afr Pharm J 2022 Volume 89 Number 1 (January/February)

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Thank you for choosing SAPJ in which to publish your paper.

Aims, scope and review policy

SAPJ is aimed at the continuing professional development of the South African pharmacist in a variety of practice settings, including clinical pharmaceutical care practitioners in a community or hospital pharmacy environment, and pharmacists in academic and industrial practice.

The journal accepts specific clinical reviews on self-medication topics (symptomatic therapy) and information on prescription medication (therapy in clinical context), and provides pharmacists with essential information for referring customers for early medical attention should it be required. SAPJ further recognises that the role of the pharmacist continually evolves to meet the needs of the population. An example of this is the provision of accessible, basic primary health care services in community pharmacies.

Papers dealing with medicines safety issues, including the safe and appropriate prescription, administration and use of medication as well as pharmacovigilance, are strongly advocated in SAPJ. SAPJ further supports pharmacists in transforming the pharmacy into an accessible, basic primary health care facility for preventing and treating primary health care conditions through diagnosis, screening and treatment.

The journal is currently indexed by Google Scholar via www.sapj.co.za and enjoys wide international exposure. An 'electronic long, paper short' policy will be followed for original papers where abstracts of original papers are featured in the printed copy with the full version available online.

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2. This work is original and all third party contributions (images, ideas and results) have been duly attributed to the originator(s).
3. Permission to publish licensed material (tables, figures, graphs) has been obtained and the letter of approval and proof of payment for royalties have been submitted as supplementary files.
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5. All co-authors have made significant contributions to the manuscript to qualify as co-authors.
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The following contributions are accepted (word counts include abstracts, tables and references):

Original research:	3 200–4 000 words
Evidence- based pharmacy practice:	3 200–4 000 words
Reviews:	2 400–3 200 words
Case studies:	1 800 words
Scientific letters:	1 200–1 800 words
Letters to the editor:	400–800 words

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A Piece of my Mind

Editorial Comment

The end of an era

This issue of the *SAPJ* carries tributes to two men who passed away recently. I knew them both, and it really is appropriate to use the word "tributes" rather than the word "obituaries". Somehow we're all reluctant to use the word "death" – it probably reminds us of our own mortality, and the word "obituary" is invariably associated with death. An obituary is often repetition of a person's curriculum vitae, but a tribute is much more of a friend's memory of that person.

So let's speak about our two friends, Trevor and David.

Tribute to Trevor

I didn't get to spend as much time with Trevor Collett as I would have liked to – geographically, that wasn't possible. But I did enjoy meeting him at the annual SAPC inspectors bosberaad. We invariably enjoyed a pleasant evening together, enhanced by a glass of good red wine. I was always entertained by his sense of humour, and the word that immediately comes to mind is "gentleman".

Tribute to David

The word that comes to mind when thinking of David Boyce is "genius". I have to admit that the first conversation I had with him wasn't much of a dialogue – I didn't understand much of what he said! (Luckily, I was newly qualified, and I did learn more as I worked more!) The longer I knew him, the more my awe of him grew. I realised that it wasn't just his knowledge that set him apart from other people, it was his creativity – he saw opportunities, and was able to design solutions to problems that I wouldn't even have been able to identify.

Conversations with another David

Chatting with Dave Sieff recently, we were saying that we should each write our own obituary or tribute or whatever we want to call it. It's difficult to write an obituary. Believe me. I know.

And we discussed what we would each call our own, and what should go into it. We concluded that what we both particularly want to do is to write messages for our families, with memories or our thoughts on various arbitrary topics – some sort of memoir, if you like.

I love what Dave suggested his should be called – "In my anecdotage". He has many anecdotes. One of them is about teeth, but I'll leave him to tell you about that, if you're lucky!

My memoir was originally going to be called "Countdown to death – an immutable deadline", because anyone who has ever worked with me knows that I'm generally hopeless with deadlines. I've actually written the first chapter, and the last, now to have the self-discipline and to write the chapters in between.

Why did the name change? Well, I decided that, because I'm going to have to die, I really need to do something to tidy my house. Either that or buy my daughters a box of matches. Looking around the house, I couldn't face such a huge task all at once. So I'd start with something small – my handbag. Logical right? Unfortunately, it was a very large handbag. WARNING – don't ever argue with a woman carrying a large, heavy handbag!

This is what I found – 53 till slips and credit card slips; 37 peppermints from restaurants/coffee shops; 3 shopping lists; 21 ballpoint pens, including one with red, blue and black ink; 1 propelling pencil; a rubber (eraser) (not that type of rubber); a pencil sharpener (note to self – the sudoku book was missing); 1 CD with dance photographs and videos; 2 identical combs; numerous crumpled tissues; a pair of earrings that I thought I'd lost; my purse, with cards and cash; R 10.70 in loose small change; R 150 in loose notes; 3 tubes of lip balm; a tin of mints from Amsterdam; a cleaning cloth for spectacles (a nice one – Rosina Wachtmeister cats); a thick rubber band; 2 small packets of tissues; 3 flash drives; keys that don't fit anything I know; 2 pairs of reading glasses; a forgotten gift card (expired); a sachet of Med-lemon; a stylus for cell phone or tablet; dance studio contract; 16 arbitrary business cards; notebook; folded plastic bag; birthday card; certified proof of bank account; hotel invoice (3 months old); 2 wool needles; various loyalty cards.

And the cherry on the top? (If you don't mind the contents being upside down.) At the bottom of my handbag, a shrivelled little Granny Smith apple!

So the title of my memoir had to change – it's now "An apple in my handbag".

Lorraine Osman

President's Message

Here's to a new year!

Joggie Hattingh
PSSA President

Isn't it wonderful that we are given a chance of a new beginning every so often? As we leave 2021 behind and we firmly focus on the year ahead, let us take the lessons learnt in the past year to heart.

Some would refer to 2021 as an "annus horribilis", and though terrible things occurred last year, so much good also came from it. If I think of the KwaZulu-Natal and Gauteng riots and looting with the loss of life and loss of means to live, one cannot reflect on it without reflecting on the unexpected and often unprecedented caring and support given to and by individuals and organisations.

The Pharmacy Support Fund immediately comes to mind, where ICPA, PSSA, the pharmaceutical industry, and numerous individuals contributed to support our colleagues who were adversely affected by the riots. Although it is cause for concern that pharmacies were actually targeted by the planners of this civil insurrection, it also highlights the extremely high value contribution pharmacies are seen to make to civil society. Pharmacies were targeted as the most valuable essential service facilities!

I hope that, as a profession, we can now focus some of our energy in 2022 to educate our communities on why it is absolutely essential to protect and defend their pharmacies, as essential service providers, for the benefit of the communities.

The COVID-19 pandemic also had some adverse effects on our members. Still, we have made strides during the pandemic to improve teamwork between the different health professions. It is no longer "us" and "them"; we are much better at working as a united health team.

2022 will, like every year, bring its own challenges. Yet we are well equipped to face these challenges. It may be good for members to have a look at the number of documents prepared by the National Office during the previous 12 months! It is a staggering number of letters written to Ministers, Departments, Commissions, Committees and Statutory Bodies. These documents are all exceptionally well written, with supporting evidence and legal arguments. It speaks volumes of the experience and skillset of the staff involved.

Having worked much closer to the Head Office team and the PSSA National Executive Committee (NEC) team during the past couple of years, I have no doubt that our profession will rise to the occasion and face the challenges 2022 may bring. However, as a profession, we are not only acting reactively to what life throws at us, we also plan ahead to shape our future and try and pre-empt challenges that we are able to foresee. To do this, we require the support of our members to offer their experience, knowledge and skillsets for the betterment of the profession.

We are extremely fortunate to have strong leadership in all of our Sectors and also in the Young Pharmacists' Group and a shared vision of a united pharmacy profession. As such, the whole PSSA NEC and the National Office are working together to make PSSA Conference 2022 possible.

We call on all of our members to join hands and make Conference 2022 a memorable event.

If I may quote some wisdom shared by a not-so-old friend: "Any conference is a success if you learn one new fact, make one new friend or rekindle one old friendship."

I hope to see you there!

Pharmacy Month 2021

Pharmacy Month campaign 2021

The 2021 Pharmacy Month campaign theme and material were carried over from the 2020 campaign that was postponed due to the COVID-19 pandemic. The theme for Pharmacy Month 2020/2021 was "*Think Pharmacy – Quality Healthcare for All*".

The subthemes for Pharmacy Month were:

- Your pharmacist is accessible
- Your pharmacist can provide medicine and information about your health
- Your pharmacist is part of a healthcare team that works together to look after you
- Your pharmacist offers support and care for you and your family
- Your pharmacist can provide advice on healthy living
- Your pharmacist can provide advice on immunisation and family planning services
- Your pharmacist can help to get you tested
- Your pharmacist can provide help with self-care and first aid

Even though Pharmacy Month took place shortly after the devastating 3rd wave of COVID-19 in South Africa and the mass roll-out of COVID-19 vaccines to the public, pharmacies were still under a lot of pressure and Pharmacy Month was not a huge event this year. The National Department of Health (NDoH) experienced delays with the printing, that had to be reduced due to budgetary constraints. In addition, the NDoH experienced numerous staff changes, including the chair of the Pharmacy Month working group who resigned during this time. This resulted in mainly the use of social media to get the message out there.

Several pharmacies and pharmacy staff have done excellent work despite the lack of resources, as shown below.

Edenvale Regional Hospital (Gauteng)

Tasmiyah Laher (pharmacist intern)

Edenvale Regional Hospital Pharmacy initiated a week-long campaign during Pharmacy Month in order to put the spotlight on the pharmacy profession and show patients and staff our role in quality healthcare provision. We chose to focus the theme on diabetes care as our staff had noticed an increase in newly diagnosed and uncontrolled diabetic patients.

We implemented several activities to cater to patients of all ages as well as show appreciation towards pharmacy personnel.

- An information table was set up every day of the week where staff members took turns to assist patients with any advice or guidance they might need. Through this, we were able to create awareness of the role of pharmacists and assistants in the patient healthcare journey.

Pharmacy personnel dressed in the colour green to celebrate the first day of our project

- We approached various companies to supply water, snacks and paraphernalia for patients. We also received sponsorship from people in the community who are eager to pay back to the community by showing some goodwill. This was greatly appreciated by the patients who were eager to be involved in our nutrition advice.
- We received a variety of items to hand out to patients who approached our information table, including stationery, glucose test logs, meal plans, carrier bags and soaps. Information guides on various diabetes-related topics proved very useful as patients could get specific advice on various aspects of diabetes management.
- A kids' table was set up where children could colour in pictures while waiting with their parents/grandparents/guardians to receive their medication. The excited response we saw from the children prompted us to keep this station beyond Pharmacy Month!
- The hospital's communications manager hosted a Facebook Live stream where she interviewed one of our pharmacists regarding the meaning behind Pharmacy Month, pharmacy career paths and the different responsibilities we hold in hospital settings.
- Training and goodies for pharmacy staff were also made available from some companies in order to replenish our knowledge as well as show appreciation for staff.
- The pharmacy was brightly decorated in colourful balloons and posters to highlight the celebration of Pharmacy Month. Posters were designed by the interns, who presented diabetes techniques to small groups of patients at the information table. For the spirit of Pharmacy Month, a dress code was suggested using a different colour for each day of the week.

Response from patients

The patients were visibly excited and appreciative of our efforts for the week. Many felt comfortable sharing their experience with diabetes and asked interesting questions. We noticed that many patients required reassurance about their condition and were grateful to receive additional advice about lifestyle factors. Children enjoyed the experience, and it was rewarding to see the difference we can make in such a special way.

Pharmacist intern, Tasmiyah Laher, providing medicine information to a patient

Dayaneethie Singh, post-basic pharmacist's assistant said: "*I enjoyed interacting with and counselling patients as I was able to identify gaps in understanding and assist patients in taking their medicine at the correct time, as well as eating correctly and regularly. I found that by having the visual pamphlets and information, patients showed interest and understood better. I believe that continuing this counselling beyond pharmacy week is important.*"

PSSA KwaZulu-Natal Coastal Branch with the 4th year B.Pharm students at University of KwaZulu-Natal

Kirtan Kasiram (SAAHIP KZN Coastal Branch Chair)

During September, the SAAHIP KZN Coastal Branch collaborated with the final year pharmacy students from the discipline of Pharmaceutical Sciences at UKZN.

Upon discussion with Dr Velisha Ann Perumal-Pillay, a Senior Lecturer of Pharmacy Practice at UKZN, and in line with the "Think Pharmacy" theme, we wanted to highlight the role that pharmacists play in post COVID-19 immunisation.

Kirtan Kasiram addressed the final year pharmacy students virtually, presenting on SAAHIP and the PSSA, and invited the students to participate in poster presentations highlighting the following topics:

- Detailing the role of pharmacists in pharmacovigilance and adverse drug reporting post COVID-19 immunisation
- Addressing vaccine hesitancy
- Guidance on how to report adverse events for both patients and healthcare workers

Interested students then created informative posters that provided graphically, valuable information and clarity to pharmacists and the public at large.

These posters will certainly help our information drive to better equip pharmacists during the pandemic. It will provide an excellent opportunity for members to have much greater insight on the above topics.

I would like to take this opportunity to thank the students for helping provide detailed information on these extremely relevant topics.

Disclaimer: The views expressed in these posters are those of the student authors and are not an official position of the University of KwaZulu-Natal or SAAHIP KZN COASTAL

The posters were shared with members in a PSSA Newsletter dated 22 October 2021.

PSSA Free State Branch – Reclaim your life and vaccinate!

Martlie Mocke-Richter (PSSA Free State Chair)

September 2021 was delegated as Pharmacy Month. As a celebration of our special month, it was decided to adopt the mantra of "quality healthcare for all". As pharmacists, it is our duty and honour to provide quality healthcare for our communities on a continual basis, but this is especially so during these unfortunate times and in Pharmacy Month.

As COVID-19 has decimated the world for the past eighteen months, the news of effective vaccines becoming available for all South Africans was a godsend.

It is of phenomenal importance that vaccines be administered as rapidly and broadly as possible. The importance of this project led us to expand our mission to include *"quality and rapid vaccines for all"*.

To promote this vaccine drive, as well as the *"quality healthcare for all"* initiative, the PSSA Free State (FS) branch decided to run a competition open to all pharmacies in the Free State. There was one competition for community pharmacies and another for institutional pharmacies.

To enter this competition, the pharmacists had to write a short summary on how *"quality healthcare for all"* could be achieved, with emphasis on the Free State vaccine roll-out campaign.

The winner in the SAAHIP sector was the Stoffel Coetzee Hospital in Smith Field.

The population in their area, as in most rural areas, had difficulty reaching the vaccination sites on the stipulated days, as many people work during the week and could not take off to be vaccinated. The Stoffel Coetzee Hospital organised a mobile clinic to provide vaccination access to the outlying areas of their community.

They further contacted farmers and other employers in the area and requested that they provide the hospital with the ID numbers and cell phone numbers of their workers to directly contact them and individually invite them to come for their vaccinations on specifically stipulated days. Furthermore, they arranged that many employers provide transport for their workers, to and from the hospital, to facilitate their vaccinations.

On the day that was allocated for the above thirty-five-year-old people to be vaccinated, the staff of the hospital provided tea, coffee and biscuits for the public who were waiting in the queue in the cold weather for their turn to receive the precious vaccine.

The PSSA FS branch truly believe that the Stoffel Coetzee hospital and their staff went the extra mile to provide "quality healthcare" for their community and are worthy winners of our competition.

Well done to Simone Jonker (RP) and her team from the Stoffel Coetzee hospital in Smith Field.

The winner of the competition for the community pharmacies and overall winner was Klinicare Pharmacy Heuwelsig.

Charolize de Lange (RP) and her team provided coffee for more than sixty people who were waiting in line for their vaccinations. Klinicare Pharmacy received positive feedback from their com-

Well done to Charolize de Lange (RP) and her team from Heuwelsig Pharmacy

munity. Their prize consisted of a coffee cart that stood outside their pharmacy for the morning; this coffee cart was sponsored by the PSSA FS Branch.

Not only were the abovementioned pharmacies awarded with various prizes, but we also decided to give our day-to-day pharmacists, who work long hours and still manage to provide quality healthcare for all, a gift. Kit-Kat chocolates were widely distributed to various private and public pharmacies to thank them for their hard work, these pharmacies included The Local Choice pharmacy, Westdene, and Pelonomi Tertiary Hospital pharmacy, amongst others. We also allocated a special hamper to Clicks Loch Logan, as they went the extra mile to promote vaccination by even contacting businesses and business owners to offer vaccination services.

The PSSA FS Branch would like to thank all the health workers, in all the various fields of healthcare, for their united effort in providing South Africans with superior quality healthcare service during the challenging period of the vaccination drive.

The PSSA FS Branch would also like to thank all the pharmacies who participated in this initiative. It is truly appreciated that so many pharmacists took the time and effort to participate despite their busy schedules.

World Pharmacists Day 2021

"Pharmacy: Always trusted for your health" was the theme of 2021's World Pharmacists Day (WPD) on 25 September. WPD is a global initiative by the International Pharmaceutical Federation (FIP) and was celebrated for the 11th time in 2021. FIP shares why the theme of trust was selected, especially during the time of a pandemic.

Why this theme of trust?

Across diverse clinical settings, patients reported greater satisfaction with treatment, showed more beneficial health behaviours and fewer symptoms, and experienced improved quality of life when they had higher trust in their healthcare professionals. Trust is a central part of all human relationships and a fundamental element of social capital. Trust is also essential to health care: there is a significant association between trust in healthcare professionals and health outcomes for patients.

People trust us

For many years, pharmacists have consistently been named among the top five most trusted professionals in national surveys. Educators are also consistently in the top five and, according to a recent survey, scientists are the most trusted people in the world. Pharmacists, educators and scientists? That's our pharmacy profession.

Why are we trusted?

Three elements are necessary for trust: positive relationships, competency/expertise, and consistency.

- **Positive relationships:** Our genuine interest in our patients and time taken to listen to their needs, as well as our extra efforts during the COVID-19 pandemic, have helped us to establish meaningful connections and continue to build positive relationships.
- **Competency/expertise:** We typically complete a four-year Master of Pharmacy degree or a doctorate in pharmacy, followed by a preregistration year/internship. Once registered, we undertake lifelong learning or further training to become more specialised.
- **Consistency:** As the most accessible healthcare provider in many parts of the world, working in premises that operate longer working hours than many other healthcare facilities, we and our pharmacies are more able to demonstrate, consistently, our skills and caring.

Many patient-pharmacist relationships are grounded in trust built over time. The public trusts our advice. They trust us to maintain confidentiality. More and more governments are trusting us to administer vaccines and to provide other expanded services, such as testing. Healthcare systems trust us to find solutions for medicines shortages. There are many more examples.

Why is this so important now?

Trust is a reservoir of goodwill for future use, and pharmacy has built up a big reserve over many years of caring and excellent practice. Now our societies are in a time of general distrust, fuelled by the COVID-19 pandemic and the infodemic around it. Trust barometers have found that distrust of societal leaders has increased, and distrust of information sources is at a record high. At a time of uncertainty and when vaccines hesitancy remains a major hurdle, public trust in pharmacy is more important than ever before. We give advice based on the best scientific evidence. We can convince the anti-vaxxers. We can use the trust in us to benefit our communities.

The PSSA/Alpha Pharm distance learning programme 2022

The PSSA/Alpha Pharm distance learning programme continues to offer pharmacists useful, practical, up-to-date information that enables them to provide optimal pharmaceutical care to their patients.

Module 1, 2022 – Mental health in a pandemic

Mental disorders have always been among the leading causes of the global disease burden, with depression and anxiety disorders being at the top of the list. With the emergence of the COVID-19 pandemic in December 2019 many questions around the resulting effects of COVID-19 on mental health have been raised.

Strategies to reduce the spread of the coronavirus (SARS-CoV-2), such as physical distancing and restricted travel, have impacted people in many ways.

COVID-19 is associated with multiple mental problems in patients with COVID-19, and in health professionals who care for patients with COVID-19. Furthermore, COVID-19 has been associated with symptoms of anxiety, depression, distress, and post-traumatic stress disorder in the general population and may exacerbate symptoms in patients who have mental disorders pre-dating the pandemic.

This module discusses mental health in the COVID-19 pandemic and covers mental health issues in healthcare workers, patients with COVID-19, those with pre-existing mental disorders and the general population.

For more information about this programme, contact Gill or Glynis at Insight Medicine Information on 011 706 6939 or email: cpdalphapharm@insightmed.co.za.

The PSSA/Alpha Pharm clinical education programme 2022 for pharmacy staff

The PSSA/Alpha Pharm pharmacy staff clinical education programme continues to offer front-shop assistants or pharmacist's assistants up-to-date information that enables them to provide optimal pharmaceutical care to their patients. All pharmacy staff need to be familiar with the use of unscheduled medicines and should be reminded of when it is necessary to refer the patient to the pharmacist.

Module 1, 2022 – Mental health in a pandemic

COVID-19 has become a global crisis that has disrupted many aspects of life for most, if not all, of the world's population. The COVID-19 pandemic is ongoing and its full impact on mental health is not known. Nonetheless, mental health has been significantly impacted by the COVID-19 pandemic.

Lockdowns, quarantines, social restrictions, school and business closures, loss of livelihoods, decreases in economic activity and the shifting priorities of governments in their attempts to control COVID-19 outbreaks throughout the world have increased psychosocial stress levels and affected the mental health of populations.

COVID-19 is associated with mental health issues in patients with COVID-19 and in health professionals who care for patients with COVID-19. COVID-19 has also been associated with symptoms of anxiety, depression, distress, and post-traumatic stress disorder in the general population and may worsen symptoms in patients who have mental disorders pre-dating the pandemic.

The front shop member of staff may be the first and only point of contact for pharmacy customers looking for an over-the-counter (OTC) treatment to help them cope with mental health issues during this pandemic. The front shop staff member may be able to use this opportunity to educate the general population, COVID-19 patients and their families about the importance of maintaining good mental health during the pandemic and how patients can take care of their own mental health.

If you would like to participate in the PSSA/Alpha Pharm pharmacy staff clinical education programme, please contact Gill or Glynis for further information on 011 706 6939 or email: cpdalphapharm@insightmed.co.za.

YPG YOUNG PHARMACISTS' GROUP

Join the NEW Steering Committee that will be elected at the 5th annual Business Meeting of the PSSA YPG!

PUBLIC RELATIONS OFFICER

Position purpose:
Communication with all members and PSSA

Major responsibilities:
- Writing the YPG newsletter
- YPG website and Facebook updates
- YPG page in the SAPJ
- General YPG communications

Fun fact about the position:
Perfect for persons with good writing skills and creativity!

CHAIRPERSON

Position purpose:
Lead PSSA YPG in all aspects

Major responsibilities:
- Co-ordination of all YPG Steering Committee activities
- YPG representation at PSSA National Executive Committee meetings
- YPG budget and finances
- Co-ordination of the YPG programme at national PSSA conferences

Fun fact about the position:
Perfect for persons with good organizational skills, enjoys teamwork. Knowledge about and involvement in PSSA committees will be beneficial.

Feel free to reach out to us at ypg@pssa.org.za or via Facebook: Young Pharmacists' Group of PSSA

Let's walk this journey together!

PROJECT COORDINATOR

Position purpose:
Co-ordination of all PSSA YPG activities

Major responsibilities:
- Manages and leads the YPG Professional Innovation Project
- Leads the co-ordination of the YPG programme at PSSA national conferences
- Manages YPG projects (mentorship programme)

Fun fact about the position:
Perfect for an organised leadership type that enjoys planning

Additional information:
Details concerning the 5th Business Meeting of PSSA YPG and application procedures/requirements will be communicated via a YPG newsletter

Note:
These positions are held for ±12 months. These are volunteer positions, and no remuneration is provided. The availability of limited travel support is dependent on the availability of funds as stipulated in the annual YPG budget.

Treatment of acute wounds and injuries: Cuts, bites, bruises and sprains

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Abstract

Acute wounds and injuries are a common daily occurrence, and their appropriate care is critical to healing. In South Africa, community pharmacists are often the first to encounter acute wounds and injuries such as cuts, bites, bruises and sprains, due to the accessibility and cost constraints associated with primary healthcare facilities. Since pharmacists assist with first aid, refer the patient for further management if necessary, and provide the appropriate dressings during the later healing phase, it is imperative for pharmacists to stay informed on developments in wound care. This review aims to highlight some of the more common acute wounds and injuries encountered by pharmacists, such as cuts, bites, bruises and sprains, and the associated therapeutic strategies.

Keywords: cuts, bites, sprains, bruises, snakebites, spider bites, dog bites

S Afr Pharm J 2022;89(1):12-18

Introduction

Acute wounds and injuries are a common daily occurrence, and their appropriate care is critical to healing and minimises scar formation as well as the occurrence of infections.[1] An injury is defined as damage to the body caused by impact such as from accidents and falls, or from use of weapons, while a wound is a breach in the integrity of the skin, mucosal surfaces or organ tissue. Wounds may be accidental, intentional or result from a disease process.[2-4] Injuries can be classified as minor or life-threatening, while wounds are classified as either acute or chronic. Acute wounds progress through sequential but overlapping phases of wound healing within four to six weeks, whereas chronic wounds still demonstrate delayed healing twelve weeks after the initial insult.[3,5,6] Due to various factors, including patient reluctance to get initial hospital/primary care facility treatment, lack of financial resources and the wound/injury being deemed less severe, community pharmacists are often the first point of contact for treatment.[6] Although patients with chronic wounds may present at the local pharmacies, it is highly recommended that they are referred to a wound care nursing sister, doctor or hospital.[6,7] This article aims to highlight some of the more common acute wounds and injuries encountered by pharmacists, such as bites, cuts, bruises and sprains, and the associated treatment strategies.

Management of acute wounds and injuries

Cuts

A cut is a break or opening in the skin and may also be referred to as a laceration. A cut may be smooth or jagged and may be shallow, involving just the upper skin layers or deeper. A deep cut can affect muscles, blood vessels, tendons, ligaments, nerves, or bone.[8] Cuts are common occurrences in most households and are classified as acute wounds, which will vary in severity depending on the object that created the cut, wound depth, location and patient factors such as comorbidities and infection.[9] These factors determine whether a cut will heal timeously or be stalled, resulting in a chronic wound. There are various preventative measures that the patient can take at home by using freely available or over the counter (OTC) products. For this article, cuts have been divided into shallow and deep, infected or uninfected wounds, and treatments recommended accordingly, as detailed in Table I. Deep wounds requiring stitches or if a potential infection is suspected (cut with dirty/rusty object) should be referred to a doctor, and elderly patients with comorbidities should always be encouraged to seek specialist wound care.

Bites

Bites are considered to be trauma wounds and the treatment of these wounds is dependent on the animal/insect and the severity of the injury. The most common bite injuries of concern sustained by humans are location dependant and include snakebites and dog bites.[14] Less common are spider bites.

Snakebites

There are 173 identified species of snakes in southern Africa and of those, approximately 11% are considered deadly.[15] In many cases, patients are bitten by nonvenomous snakes and 10– 50% of those bitten by venomous snakes are not envenomed, resulting in a "dry bite" (no antivenom necessary).[15,16] Snakebites by venomous snakes should be treated swiftly and urgently as they may potentially be life-threatening.

Venomous snakes in South Africa can be classified into three broad groups: cytotoxic, neurotoxic and haemotoxic.[16] The South African Vaccine Producers (SAVP) produce a polyvalent antivenom

Table I: Treatment of cuts[9-13]

Classification	Characteristics	Treatment strategy
Shallow uninfected	• Superficial • Signs of inflammation • Painful • Does not need sutures, but skin must be re-aligned • Complications: ◦ Maceration ◦ Infection ◦ Wound dehiscence	• Clean wound with antiseptic agent • Promote moist wound healing and wound closure • Pain relief (e.g. paracetamol or ibuprofen) • Prevent dehiscence • Prevent infection • Dressings: ◦ Steristrips ◦ Hydrocolloids ◦ Hydrogel sheets
Deep uninfected	• Deep wound penetrating through dermis, can affect blood vessels, ligaments, muscles, tendons and bone • Signs of inflammation • Painful • Requires closure • Complications: ◦ Maceration ◦ Lack of healing ◦ Infection ◦ Wound dehiscence ◦ Nerve damage	• Stop bleeding • Clean wound with antiseptic agent • Pain relief (paracetamol or ibuprofen) • Wound closure with sutures, staples or glue depending on location ◦ Procedure may require anaesthetic • Prophylactic antimicrobial cream • Dressings: ◦ Hydrocolloids ◦ Hydrogel sheets ◦ Foam (exuding wounds)
Shallow infected	• Scratch or scrape caused by dirty object (e.g. rusted nail) • Clinical signs of infection • Increased pain • Complications: ◦ Spread of infection ◦ Lack of healing	• Flush the wound and clean with appropriate antiseptic agent • Topical antimicrobials to treat infection (silver, copper) • Pain relief (paracetamol or ibuprofen) • Promote moist wound healing • Dressings: ◦ Iodine ◦ Chlorhexidine ◦ Honey ◦ Hydrophobic dressings
Deep infected	• Deep puncture caused by dirty object (e.g. rusted nail) • Increased exudate • Odour • Necrotic tissue • Complications: ◦ Spread of infection ◦ Lack of healing ◦ Pain ◦ Nerve damage	• Remove necrotic tissue • Fill dead space • Treat infection (oral antimicrobial) • Tetanus vaccine recommended • Pain relief (paracetamol or ibuprofen) • Sharp debridement where necessary • Contaminated and infected wounds should not be closed immediately, but left open to heal by secondary intention • If wound is more than six hours old, manage with surgical toilet, leave open and then close 48 hours later • Dressings: ◦ Cadexomer iodine ◦ Honey ◦ Silver ◦ Polyhexamethylene biguanide (PHMB) ◦ Hydrophobic dressings ◦ Hypochlorous acid (HOCl) soaked dressings

effective against the cytotoxic effects of puff adder, gaboon adder, and rinkhals venom, as well as the neurotoxic venom of mambas and neurotoxic cobras. They also produce two monovalent antivenoms for the haemotoxic effects of the boomslang and the exotic saw-scaled viper.[15,16] General first aid for snakebites that should be conducted prior to referral to an emergency room is highlighted in Table II.

Dogs, cats and other wild animals

The most common complication arising from animal bites are initial blood and tissue loss with later skin infections, while the most feared complication is rabies.[17] Severe animal bites can result in serious long-term complications such as osteomyelitis and septic arthritis, these are especially seen in bites on the hands.[17] According to the World Health Organization (WHO), bites from dogs and wild animals can be divided into three categories based on the need for post-exposure prophylaxis (PEP).[18] The first category where skin penetration is not obvious requires no treatment, while the second (minor scratches or abrasions) and the third categories (single or multiple transdermal punctures, tears or scratches) require PEP, which may include treatment with rabies immunoglobulin (RIG) and vaccination[18] as detailed in Table II.

Table II: Classification, characteristics and treatment strategies of medically important bites

Classification	Characteristics	Treatment strategy
Snakebites[15,16]		
Neurotoxic Black mamba, green mamba, and some non-spitting cobras	Neurotoxic effects: • Drowsiness • Vomiting • Increased sweating • Blurred vision • Drooping eyelids • Difficulty in swallowing, speaking and breathing • Muscle weakness/paralysis • Progressive paralysis of the respiratory muscles leading to respiratory failure • Respiratory failure is usually the primary cause of death • Neurotoxic snakes can cause life-threatening paralysis and death within 1–8 hours	General first aid: • Patient should be safely transported to a hospital as soon as possible • Patient should be kept calm and immobilised as movement accelerates the spread of venom in the lymphatic system • Remove rings and tight clothing • Apply pressure bandages • Cardiopulmonary resuscitation (CPR) may be needed • Intravenous fluids should be administered to shocked, hypotensive patients and pressor agents (dopamine or phenylephrine) can be considered in certain cases • Oral analgesia such as paracetamol or paracetamol/codeine combinations can be administered ◦ Aspirin and other nonsteroidal anti-inflammatories (NSAIDs) are contraindicated in patients with haemostatic disorders ◦ Monitor respiratory function when opioids are given to patients with neurotoxic snake bite • Snakebite patients who are asymptomatic should be admitted to a medical facility and monitored 12–24 hours • Snakebite can introduce pathogenic bacteria increasing the risk of local infections ◦ Clean bite wound with an antiseptic ◦ Aspirate blisters and tense bullae only if rupture seems imminent ◦ Do not elevate snake bitten limbs excessively (increased risk of ischaemia) ◦ Debride necrotic and gangrenous tissue ◦ Appropriate antimicrobial treatment • **Avoid the following contraindicated measures:** ◦ Cauterisation, local incision or excision, immediate prophylactic amputation of the bitten digit, suction by mouth or vacuum pumps or 'venom-ex' (venom extractor) apparatuses, instillation of chemical compounds such as potassium permanganate, application of petrol, ice packs, "snake stones" and electric shocks • Antivenom is available for bites of some neurotoxic and cytotoxic snakes (SAIMR Polyvalent Snakebite Antiserum SAVP) • Antivenom is available for boomslang bite (SAIMR Boomslang Snakebite Antiserum SAVP) • Contact 24-hour Poisons Information Helpline on **0861 555 777**
Cytotoxic Puff adder, rhombic night adder, Mozambique spitting cobra and stiletto snake	Cytotoxic effects: • Symptoms may include immediate burning pain at the site of the bite followed by local swelling, blistering and oedema, which may continue for several days • In severe cases, the entire limb may swell • Local tissue necrosis or gangrene may occur and may result in the loss of a limb	
Haemotoxic Boomslang	Haemotoxic effects: • Affects blood coagulation • Usually little/no swelling and pain initially • Headache, mental confusion, nausea, vomiting, abdominal pain, increased sweating • Persistent oozing of blood from the fang punctures • After several hours, bleeding from small cuts, the mucous membranes of the mouth and nose, purple patches under the skin • Eventually, severe internal bleeding resulting in vomiting of blood and haemorrhage from the bowels • Kidney failure and brain haemorrhage may occur after a few days	
Bites (Dogs, cats and wild animals)[17,18]		
Category II: • Animal nibbles uncovered skin • Minor scratches or abrasions without bleeding	• Superficial wounds • Irritation • Inflammation • Infection caused by animal saliva or teeth • Rabies • Tetanus	• Wound should be immediately and thoroughly flushed and washed with mild soap and water or antiseptic solution • Application of virucidal agent such as povidone-iodine or similar • Immediate rabies vaccination if appropriate • Tetanus vaccine and antibiotic treatment administered for contaminated wounds • Antimicrobial dressings, if required: ◦ Cadexomer iodine, honey, silver, copper, PHMB, hydrophobic dressings, HOCl • Application of local remedies is discouraged
Category III: • Single/multiple transdermal bites or scratches • Contamination of mucous membranes with saliva from licks • Licks on broken skin • Exposure due to direct contact with bats: severe exposure	• Severe bite wounds • Deep wounds • Puncture • Pain • Bleeding • Inflammation • Infection caused by animal saliva or teeth ◦ Osteomyelitis ◦ Septic arthritis • Rabies • Tetanus • Odour	• Bleeding can be slowed/stopped by compression with a clean towel or gauze • Thorough cleaning and deep irrigation of the wound • Application of a potent antiseptic agent • Rabies immunoglobulin (RIG) should be administered with the rabies vaccine into and around the wound site • Most severe bite wounds are best treated by a daily dressing, followed by secondary suturing when necessary • Recommended dressings: ◦ Antimicrobial: Cadexomer iodine, honey, silver, copper, PHMB, hydrophobic dressings, HOCl ◦ Other: High absorbent dressings • If the wound occurs in the lower limb, compression may be required • If sutures are required, it is advised to delay the closing of the wound for several hours to allow adequate diffusion of the RIG into the tissues • Tetanus vaccine and antibiotic treatment administered for contaminated wounds • Pain management

Spider bites[19, 20]		
Neurotoxic Button or widow spiders	• Latrodectism • Pain and burning at bite site • Within an hour patient may develop generalised muscular pain and cramps, usually in the abdomen, chest, back and thighs • Abdominal pain is usually so intense it may be mistaken for appendicitis or ruptured appendix • Chest tightness and difficulty breathing • Elevated blood pressure • Headache, nausea, vomiting • Numbness, restlessness • Anxiety and profuse sweating • Systemic intoxication may last a week or longer, causing the patient to become exhausted, dehydrated and prone to the development of complications	• Monovalent spider antivenom available for *Latrodectus indistinctus* (black button spider) is the only effective treatment for severe latrodectism • In severe cases, patient should be kept hydrated by use of IV fluids • Calcium gluconate IV can be administered for muscle cramps • Oral antimicrobial therapy (if required) • Administration of tetanus vaccine recommended • Cortisone • Pain relief ◦ Opioids and benzodiazepines: monitor for respiratory depression • Do not use antihistamines
Cytotoxic Violin, recluse, and sac spiders	• Necrotic arachnidism • Appears as redness or a red mark • Local swelling is not significant soon after the bite • Prominent itching • Within 12–24 hours, the bite site becomes erythematous, oedematous, painful, and may develop mottled haemorrhagic areas or blisters • After a couple of days, the lesion may resemble a furuncle or carbuncle, which may be complicated by aggressive, spreading cellulitis with discharge • Necrotic tissue may develop at the bite site within 3–7 days • Necrotic tissue detaches after about 2–3 weeks, leaving a slow-healing ulcer which can take months to heal. • In rare cases, violin spider bites may present with severe, sometimes life-threatening systemic complications such as haemolysis, coagulopathy, shock, renal failure, and multiple organ damage	• The majority of lesions are self-limiting and will heal spontaneously • There is no antivenom for cytotoxic spiderbite in South Africa • Primary treatment involves management of the symptoms and prevention/treatment of secondary infections with antimicrobial agents • Occasionally spreading cellulitis may develop, requiring aggressive parenteral antibiotic therapy and hospitalisation • Wound cleansing is useful in decreasing the toxin and bioload: • Betaine/polyhexanide (Prontosan®) ◦ Hypochlorous acid (Trifectiv®, Hydrocyn®, Noxmaria®, Veriforte®) ◦ Moist wound dressings can absorb the excess exudate and toxins ◦ Hydroactive innovation dressings (HydroClean plus®) ◦ Hydroconductive dressings (Drawtex®) ◦ Hydrophobic dressings (Sorbact®/Sorbact active®) ◦ Hydrofibre dressings (Aquacel®, Biosorb®, Durafibre®, KerraCel®) ◦ Super absorbent hydroactive dressings (Sorbion Sachet S®, Eclypse®, Kliniderm® superabsorbent) ◦ Foam dressings (Allevyn®, Biatain®, Cutimed Siltec®, Tegaderm foam®) • Development of an abscess or suspected necrotising fasciitis is an indication for surgical intervention • Antimicrobial dressings appear to be beneficial in management and prevention of infection: ◦ Cadexomer iodine, honey, silver, PHMB, hydrophobic dressings • Topical haemoglobin (Granulox®) has been found to enhance oxygen uptake at the wound site resulting in enhanced wound healing and granulation tissue formation • Large areas of necrosis may require excision with primary or secondary closure or a skin graft • Sulfone antibiotics such as dapsone has been used with some success in cases of recurrent, chronic necrotic skin lesions, especially those non-responsive to surgical interventions
Painful bites which may cause infection Wandering or rain spiders and baboon spiders	• Inflict quite a painful bite • Penetration of skin by fang may cause infection • Specific systemic effects have not been documented	• Management includes: ◦ Reassurance ◦ Pain management ◦ General wound care ◦ Tetanus vaccine ◦ Prevention of infection

It is recommended that patients with serious wounds be given first aid treatment and referred to an emergency room.

Spider bites

Spiders of medical importance in southern Africa can be divided into neurotoxic, cytotoxic as well as those that cause a painful bite which may lead to infection.[19] Neurotoxic spiders such as the button or widow spiders belong to the *Latrodectus* genus and may cause a syndrome known as latrodectism, a term used to describe the systemic symptoms and signs of envenoming in humans. Cytotoxic spiders such as violin, recluse (genus: *Loxosceles*) and sac (genus: *Cheiracanthium*) spiders can cause a syndrome called necrotic arachnidism. The wandering or rain spiders (genus: *Palystes*) and baboon spiders (family: *Theraphosidae*) are non-toxic but cause particularly painful bites, which may result in infection.[19,20] The general symptoms associated with spider bites are initial pain, but then the symptoms subside and return as a painful red area with a black or necrotic centre, inflammation, itching or rash, but those associated with the medically important spiders can be more serious.[20] Treatment strategies and characteristics of medically important spider bites have been summarised in Table II. Advice on snake and spider bites in

South Africa can be sought from the 24-hour Poisons Information Helpline, which is serviced by both Tygerberg Hospital and Red Cross War Memorial Children's Hospital on **0861 555 777**.[21]

Bruises

Bruises present as bluish, purple, grey-green or black marks due to trauma (e.g. from sporting activities, falls, heavy bumps) which causes the blood capillaries underlying the skin's surface to rupture, resulting in blood infiltration into the subcutaneous interstitial tissues.[22,23] These injuries are often associated with pain, swelling and inflammation, and the time they take to appear at the surface of the skin is highly dependent on the depth of injury.[24] The tendency to bruise is increased in certain disease states such as bleeding disorders, in patients taking anticoagulant or corticosteroid medication and certain herbal supplements.[24-26] In the older adult population, bruising is prominent due to falls and thinning of skin.[27,28] Women tend to bruise easily because of a large distribution of adipose tissue, which is in contrast to children who bruise easily as a result of a lesser distribution.[24] Healing of bruises can be enhanced using the RICE procedure, which involves resting the bruised area and protecting it from further harm, placing ice on the bruise repeatedly as needed, compressing the bruise to prevent swelling, and elevating the affected area above the heart if applicable.[29] Pharmacists may prescribe pain relief and anti-inflammatory drugs to treat the bruise. If there is no pain relief and swelling does not subside after three days, the bruise enlarges and a lump forms over it, it should then be referred to a doctor or specialist.[22,24] The treatment modalities for bruises are highlighted in Table III.

Sprains

Sprains are common injuries with which patients present in the pharmacy and these are characterised by pain, tenderness or weakness in a localised area or when a joint is stressed, due to a stretched or torn ligament (the elastic, fibrous tissue that connects two or more bones at a joint).[29-31] In severe sprains, tearing of the elastic fibres is usually present,[31] and although they are a common sports injury, they can easily occur during daily activities such as walking, gardening and cleaning.[29] Sprains are often experienced around the ankle, foot, wrist, thumb or knee, and the injured area may be swollen or bruised.[31] The main goals in treating sprains are to limit inflammation and swelling, as well as maintain range of motion (how far one can move or stretch the joint or a muscle), though treatment is highly dependent on the grade of the sprain (refer to Table III).[29,30] Similar to bruises, minor sprains are treated following the RICE procedure in addition to the different treatment modalities highlighted in Table III. Before initiating treatment, it is very important that the pharmacist assesses the cause of severe pain and if signs of bone fracture are visible, a referral to a doctor or specialist should be made.

Table III: Treatment of bruises and sprains[23, 29-32]

	Characteristics	Treatment strategy
Bruise	• Pain, swelling, inflammation • Initially look red, then present as black and blue marks, then finally, appear yellow as they fade	RICE procedure: • **R**est and/protect bruised area • **I**ce – stops blood flow to the injury site, limiting the size of the bruise, also minimises swelling and pain • **C**ompression with splint or elastic bandage to prevent swelling • **E**levate affected area • Pain and inflammation management ◦ Paracetamol ◦ Ibuprofen gel, mousse or spray • Heparinoid – reduces swelling and promotes healing • Vitamin K • Aloe vera cream • Intermittent vacuum therapy (IVT) with vacuumed device
Sprain	• Classified from grade 1 to 3: • Grade 1: ◦ Mild stretching of a ligament, with some damage to its fibres ◦ Mild swelling and tenderness ◦ No joint instability ◦ Minimal pain • Grade 2: ◦ More severe injury involving a partial tearing of the ligament ◦ Moderate pain, swelling and tenderness ◦ Mild to moderate joint instability ◦ Weight-bearing and walking is painful • Grade 3: ◦ Complete tearing of the ligament ◦ Severe pain, swelling and tenderness ◦ Patients unable to bear weight or walk	• RICE procedure for Grade 1 and 2 sprains • Treat pain with topical opioids or NSAIDs • Systemic OTC medication to reduce pain and inflammation may be used, e.g. paracetamol, ibuprofen • Periodic application of warmth 48 hours after injury may relieve pain and speed up healing ◦ **Never apply heat immediately after an injury** • Refer grade 2 and 3 sprains to a doctor • For Grade 3 sprains, a short cast or brace may be used for 2–3 weeks • Intermittent vacuum therapy (IVT) with vacuumed device

SPEEDS RECOVERY BY REDUCING MUSCLE PAIN AND INFLAMMATION*[1,2]

First analgesic effect 1 hour after application*[1]

Topical delivery reduces potential for systemic side effects**[3-5]

Speeds recovery – for active patients who want to get back on their feet fast[1,6]

*Pain-on-movement in acute neck pain
** vs. oral NSAIDs

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S0 20 g, 50 g S1 100 g. Voltaren Emulgel. Each 100 g of gel contains 1,16 g diclofenac diethylamine corresponding to 1 g diclofenac sodium. Reg. No.: U/3.1/77. Indicated for use in adults and adolescents older than 12 years. Safety in pregnancy and lactation has not been established. Consult your pharmacist/healthcare professional if needed. GlaxoSmithKline Consumer Healthcare South Africa (Pty) Ltd. 39 Hawkins Avenue, Epping Industria 1, Cape Town, 7460. Reg. No.: 2014/173930/07. For full prescribing information refer to the professional information approved by the medicines regulatory authority. For any further information, including safety, please contact the GSK Hotline on +27 11 745 6001 or 0800 118 274. Always read the label before use. Trademarks are owned by or licensed to GSK group of companies.
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Conclusion

Pharmacists are often the first point of contact for the treatment of minor wounds and injuries resulting from cuts, bites, bruises and sprains, and in such instances, they are frequently asked for advice on how to treat these wounds and injuries. As wound care is important and often expensive, the role of the pharmacist is critical, and requires an informed and integrated approach with wound care specialists to ensure effective management of wounds and injuries in patients.[6] The primary role of the pharmacist is to provide initial assessment and support (e.g. pain/inflammation relief) to the patient on the management of wounds and injuries. In South Africa, many pharmacists assist with first aid procedures and provide the appropriate dressings during the later healing phase. Therefore, it is important that they receive continuing professional development in the area of acute wound and injury assessment and classification.

Conflict of interest

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Hypertension

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Abstract

This article provides an overview of the changes that have taken place in the diagnosis and management of hypertension over the past decade. Hypertension remains a widespread condition seen in South Africa. The approach to managing hypertension includes necessary lifestyle modifications and a decisive, stepwise escalation process in the pharmacotherapeutic management thereof. Most guidelines are still promoting thiazide diuretics to be the initial (first-line) drug of choice, with the addition of other suitable antihypertensive agents, if necessary, and according to any relevant comorbid conditions.

Keywords: hypertension, antihypertensive agents, fixed-dose combination therapy, angiotensin II-receptor blockers, angiotensin-converting enzyme inhibitors, calcium-channel blockers

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Introduction

Hypertension is a haemodynamic disorder associated with a rise in peripheral vascular resistance that can, in turn, lead to myocardial infarction, renal failure, strokes and death if not identified early and treated correctly.[1-3] It is the most common condition seen in South Africa, estimated to have caused 46 888 deaths and 390 860 disability-adjusted life years in 2000.[4] Most patients with hypertension do not attain the blood pressure (BP) goal of < 140/90 mmHg. A reduction in BP is considered the primary determinant of a reduction in cardiovascular risk. Factors found to be associated with high BP are the result of a complex relationship between genetic and environmental elements, which can lead to activation or inhibition of one or more of the processes involved in the normal control of BP.[1,3,5-7] Dietary factors and physical inactivity contribute to the genetic predisposition, while environmental factors include smoking, drinking, obesity and alcohol, thus making hypertension a preventable cause of morbidity and mortality. The advantages of populations with hypertension leading a healthy lifestyle cannot be stressed enough; this includes a controlled diet and regular exercise. The primary goal of treatment is to abolish the risks factors associated with hypertension without reducing the patient's quality of life.[1-4]

The renin-angiotensin-aldosterone system (RAAS) and the sympathetic nervous system are involved in regulating arterial BP. Hypertension is usually viewed as a multifactorial condition, which interferes with different pressor mechanisms and acts on several physiological systems. The three main factors determining BP are renal sodium excretion (and the resultant impact on plasma and total body volume), vascular tone and cardiac performance. Each of these factors controls the vital determinants of BP, such as cardiac output, intravascular volume and systemic vascular resistance. The RAAS plays a central role in elevating BP through these mechanisms. This system regulates renin secretion, with feedback systems from sodium balance, arterial BP levels and angiotensin II. The direct vasoconstrictor effect of angiotensin II, resulting from the secretion of renin, can increase systemic vascular resistance, and salt and water retention can lead to an increase in the extracellular blood volume. The rationale for combining drugs from different classes lies in reaching the BP target more rapidly, as each drug will work on a separate site, blocking different effector pathways.[1,3,7,8] An overview of the RAAS system is presented in Figure 1.[9]

Hypertension is a growing global problem that is associated with numerous underlying pathophysiological conditions.[10] These include ventricular hypertrophy, endothelial dysfunction, metabolic syndrome, a procoagulant state, oxidative stress, inflammation and a genetic predisposition to cardiovascular events.[11] The high prevalence of hypertension is a particular concern in developing countries as it contributes to the present and anticipated pandemic of cardiovascular disease (CVD). CVD was previously ranked as the second-highest cause-of-death category in South Africa, resulting in major cost implications for developing countries.[12] The control of hypertension and trying to curb the risk factors, such as cigarette smoking, dyslipidaemia and diabetes mellitus, is a major challenge.[13] This indicates that there is a great need for antihypertensive agents that achieve more than the mere lowering of BP, and which provide advantages in the prevention and management of CVD.[14]

Guidelines

The seventh and eighth reports, respectively, of the Joint National Committee (JNC) on the prevention, detection, evaluation and treatment of *high* blood pressure (JNC 7 and JNC 8), and the South African hypertension guidelines were drawn up to promote the evidence-based, accessible and comprehensive management of hypertension by healthcare professionals, and serve as valuable resources in both the public and private healthcare sectors in South Africa.

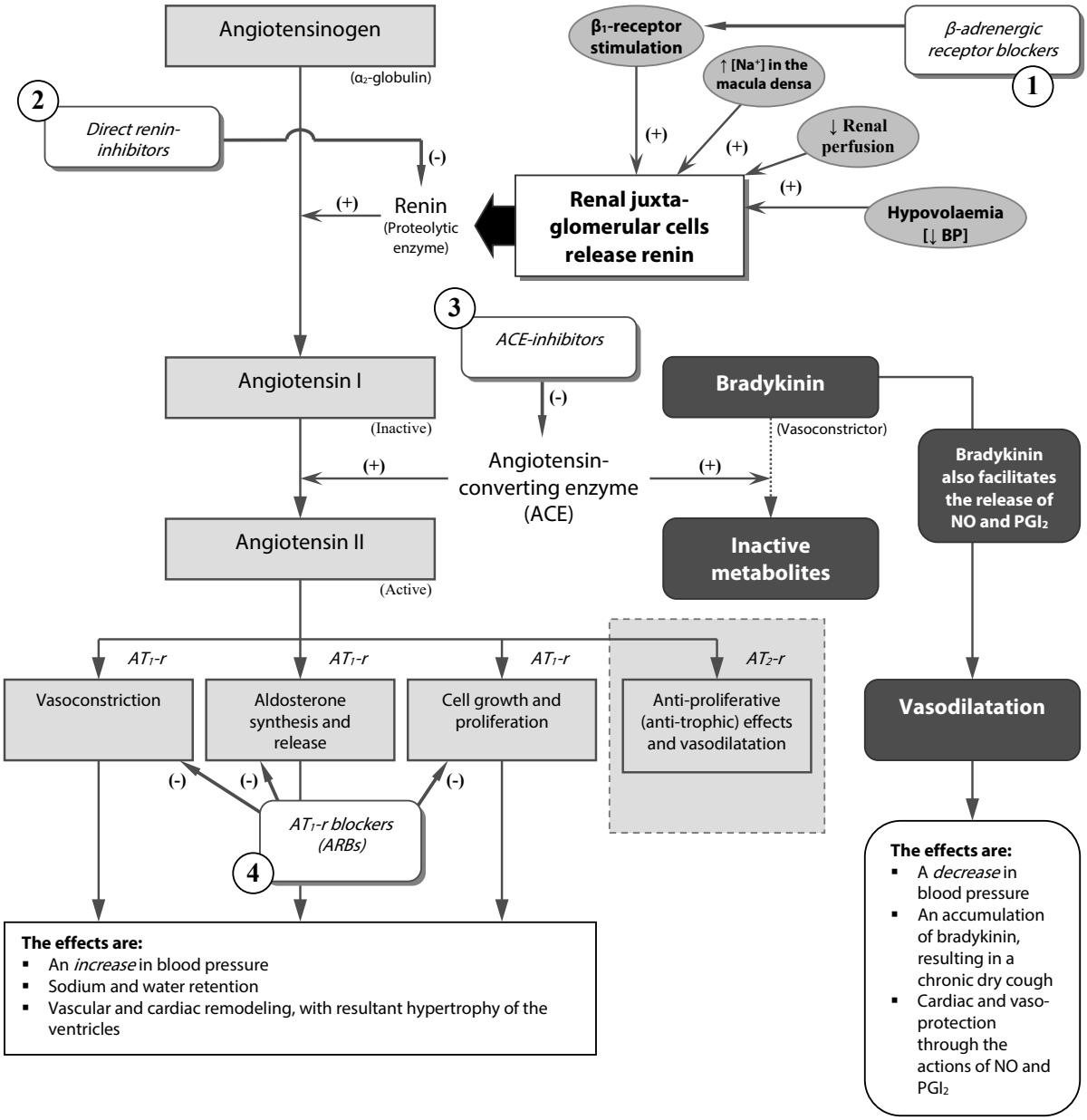

Figure 1: Diagram of the renin-angiotensin-aldosterone system, showing the sites of action of the β-adrenergic receptor blockers, the direct renin inhibitors, the angiotensin-converting enzyme inhibitors and the angiotensin II AT_1-receptor blockers[9]

ARBs – angiotensin-receptor blockers, ACE – angiotensin-converting enzyme

JNC 7

The rates of detection, treatment and control of high BP have improved over the last two decades, but not by much. Only 34% of hypertensive people had BP readings at goal level in the 1999–2000 National Health and Nutrition Examination Survey, compared with 27% in the one conducted from 1991–1994.[15] Therefore, it was with great need that the JNC 7 committee drew up a revised document, as the previous system was too complicated for several reasons. For example, risk Group A (no risk factors) included only premenopausal women. Male gender and postmenopausal status were defined as risk factors.

Additionally, there was little value in distinguishing between stage 2 and stage 3 hypertension, as the treatment was the same for both.[15,16] Another important issue that the committee highlighted was that the old category of so-called normal to high BP (130/85–139/89 mmHg) led to complacency in patients and did not adequately alert them to their risk.[16,17]

The JNC 7 report was published in 2003, with the following important highlights:[16,17]

- A systolic BP (SBP) of greater than 140 mmHg is a more important CVD risk factor than diastolic BP (DBP) in patients aged 50 years and older.
- The CVD risk doubles for each increment of 20/10 mmHg, beginning at 115/75 mmHg.
- Prehypertensive individuals (SBP 120–139 mmHg or DBP 80–89 mmHg) should undergo lifestyle modification interventions to reduce the likelihood of disease progression.

- Thiazide diuretics should be used alone or as part of drug treatment for uncomplicated hypertension.
- The initiation of therapy should involve more than two agents, one of which should include a thiazide diuretic, especially when hypertension is complicated by other high-risk conditions, such as diabetes and chronic kidney disease (CKD), and in patients with a BP higher than 20 mmHg above the SBP goal, or more than 10 mmHg above the DBP goal.

JNC 8

The JNC 8 report is a simplified treatment guideline for hypertension, whereby patients are categorised according to their age, and whether or not they have diabetes or CKD. The actual definitions of hypertension and prehypertension are not addressed in these guidelines, but the thresholds for pharmacological treatment are highlighted. The latter includes agents from four medication classes, namely the angiotensin-converting enzyme (ACE) inhibitors, angiotensin II-receptor blockers (ARBs), calcium-channel blockers (CCBs) and thiazide-type diuretics.[16]

The JNC 8 guideline was published in 2014, 10 years after the JNC 7 report was launched. This guideline features a few changes:

- Discourages concurrent use of ACE inhibitors and ARBs, and promotes their use in all patients with CKD and hypertension.
- Initiating patients of African descent without CKD on CCBs and thiazides, and not the ACE inhibitors as there is little evidence that it will improve kidney outcomes.
- Target goal blood pressure be reached within a month of initiating treatment by either pushing the dose of the initial drug higher or using a combination of medications.[2]

South African hypertension guidelines

The Southern African Hypertension Society published the fifth hypertension guideline, which implements a national standard to improve the quality of care for persons living with hypertension. The main aim of the document is to diminish the impact of hypertension and related CVD on patients who are at risk in South Africa.[14]

Classification of blood pressure

According to the JNC 7 guidelines and the South African hypertension guidelines, the seven categories of BP defined in the JNC 6 were simplified and reduced to four. BP should be recorded with an approved device in a patient who has been seated for at least 3–5 minutes before taking the measurement. To prevent missing the auscultatory gap, the SBP should be done by palpation, and then the approved device should be used. The patient should not have smoked or taken any caffeinated drink or food in the preceding 30 minutes. Two readings 1–2 minutes apart should be taken, and if the readings differ by > 5 mm, more readings are advised. Measurements should be done in both arms at the first consultation and if there is a wide variance, use the arm supported at heart level. To document postural hypotension in patients aged 60 years and older, and those with other comorbidities, e.g. diabetes mellitus, BP should also be recorded after the patient has been standing upright for at least 1–3 minutes.[15,18] The cuff size appropriate to the size of the patient's arm is an important parameter, and both the SBP and DBP should be recorded. A standard cuff of 12 cm for a normal and 15 cm for an arm with a mid-upper circumference > 33 cm.

Self-monitoring of BP and ambulatory BP monitoring can be used in the following selected instances:[15]

- Suspected "white coat" readings (higher readings in the office compared to readings outside), or masked hypertension (normal readings in the office and higher readings outside).
- In patients with comorbid conditions according to which they are classified as a so-called high-risk group, to guide antihypertensive medication.
- Refractory hypertension.
- To improve compliance with treatment (the self-monitoring of BP only).

BP can be staged according to actual BP and other comorbid conditions. Table I provides an overview of the BP categories.[15,16]

Table I: Blood pressure staging

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Normal	< 120	< 80
Optimal	120–129	80–84
High normal	130–139	85–89
Grade 1	140–159	90–99
Grade 2	160–179	100–109
Grade 3	≥ 180	≥ 110
Isolated systolic	≥ 140	< 90

The following are the new optimal BP levels in patients 60 years of age or older, with or without comorbidities, according to the JNC 8:

- The BP goal is < 150/90 mmHg in patients aged 60 years or older, and who do not have diabetes or CKD.
- The new BP goal is < 140/90 mmHg in patients aged 60 years and older who have diabetes, CKD or both.
- Optimal BP is < 140/90 mmHg in patients aged 18–59 years of age, without any comorbidities.

However, the South African hypertension guidelines do not support the JNC 8 recommendations but rather advise that a blood pressure of < 140/90 mmHg irrespective of CV risk or comorbidities is recommended. However, patients who are 80 years and older who have an SBP of > 160 mmHg must be initiated on treatment with the aim of reaching between 140–150 mmHg.

Furthermore, the South African hypertension guidelines recommend that glucose and cholesterol monitoring is imperative and that aspirin should be used to prevent stroke, myocardial infarction or transient ischaemic attacks and not given to all hypertensive patients[14]

An overview of the changes

The ensuing discussion provides an overview of changes in the management of hypertension according to the JNC 7 and JNC 8.

Point 1: Do not ignore systolic hypertension

High SBP, i.e. > 140 mmHg, is considered to be much more important than high DBP as a cardiovascular risk factor in patients aged 50 years and older.[16,19] The Multiple Risk Factor Intervention Trial (MRFIT) screened more than 316 000 men, and the investigators concluded that SBP was a stronger risk factor than DBP.[16,19]In addition to the MRFIT, another five were performed: the Hypertension Detection and Follow-up Program (HDFP), Hypertension-Stroke Cooperative Study, Medical Research Council (MRC) Study, the Australian National Blood Pressure (ANBP) therapeutic trial in mild hypertension and the Department of Veteran Affairs (VA) Cooperative Study Group on Antihypertensive Agents. Patients aged 30–69 years received medication to lower their DBP to < 90 mmHg, and the results indicated a reduction in cerebrovascular events, heart failure and overall mortality in patients. The JNC 8 panel considered keeping the DBP at a target goal of < 90 mmHg in young patients. However, there was insignificant evidence for the benefits of an SBP goal lower than 140 mmHg in patients younger than 60 years. The JNC 7 and 8 highlight two very important facts: the importance of controlling DBP in patients younger than 60 years in terms of reducing cardiovascular risk, and the need to control SBP in patients aged 60 years and older.[15,16]

Point 2: Older patients will eventually become hypertensive

At some stage of our lives, everybody will eventually become hypertensive if they live long enough. According to the Framingham Heart Study data, normotensive people aged 55 years have a 90% lifetime risk of developing hypertension. These data also indicate that people with a BP reading between 130/85 mmHg and 139/89 mmHg have a drastic 37.3% chance of developing sustained hypertension within four years if they are younger than 65 years, and 49.5% if they are older than that.[16,20]

Point 3: Prehypertension creates hypertension

The risk of cardiovascular disease doubles with each increment of 20/10 mmHg above 115/75 mmHg for people aged 40–70 years.[21] People with an SBP of 120–139 mmHg, or a DBP of 80–89 mmHg, are now considered to be prehypertensive, and healthy lifestyle modifications, such as losing weight, exercise and reducing dietary sodium intake, might be able to delay or prevent the onset of hypertension.[16]

Point 4: Use thiazides

Thiazides seem to be comparable to or better than other classes of drugs for many patients, and this group of drugs form the basis of antihypertensive therapy in most outcome trials.[22] JNC 8 recommended thiazide-type diuretics as initial therapy for most patients because of their evidence-based efficacy and can be used as monotherapy or in combination with other drug classes.[2]

Point 5: Patients will need more than one medication

It is most likely that patients with hypertension will need at least two antihypertensive medications to achieve their BP goal (< 140/90 mmHg for most patients, or < 130/80 mmHg for patients with diabetes mellitus and/or renal disease). Another drug from a different class should be added when the use of a single drug in adequate dosages fails to achieve the BP goal. It is necessary for most patients that one of the drugs is a thiazide diuretic as this boosts the effects of other classes of drugs.[15,16]

Point 6: Patients with higher blood pressure should start with two drugs

It is essential to consider starting therapy with two agents, one of which should be a thiazide-type diuretic, if the patient's BP is higher than the BP goal by more than 20 mmHg (SBP) or 10 mmHg (DBP). The rationale is simple: many patients who are started on a single agent never achieve optimal control because their dosage is never adjusted upwards, or a second drug is never added. However, it is important to be cautious as patients can be at risk of orthostatic hypotension, e.g. those with diabetes or autonomic dysfunction, or those who are very old.[15,16]

Point 7: Work with the patient to build compliance

Compliance is one of the most important key aspects in ensuring that effective therapy occurs. Patient motivation is fundamental when aiming to follow a healthy lifestyle.[16]

Therefore, healthcare professionals should take the following into cognisance:

- Try to understand the patient's attitudes, culture, beliefs and previous experiences with the healthcare system. In particular, determine their concerns and fears about therapy.[16]
- Ensure that the patient understands and agrees with the goals of treatment.[16]
- Remove barriers to care, such as the cost of treatment.[16]
- Ensure treatment strategies are tailored specifically for the patient and patient preference.[2]

Non-pharmacological treatment

The South African hypertension guidelines and the JNC 8 highlight that the non-pharmacological management of hypertension has not changed from that outlined in the previous JNC 7 guideline. Lifestyle modification remains the key non-pharmacological management.

Lifestyle modification

A healthy lifestyle remains the foundation of managing hypertension, regardless of BP level. In addition to decreasing BP, it enhances antihypertensive drug efficaciousness and decreases total CV risk.

Thus, the following measures assist the patient to ensure a better, healthier life:

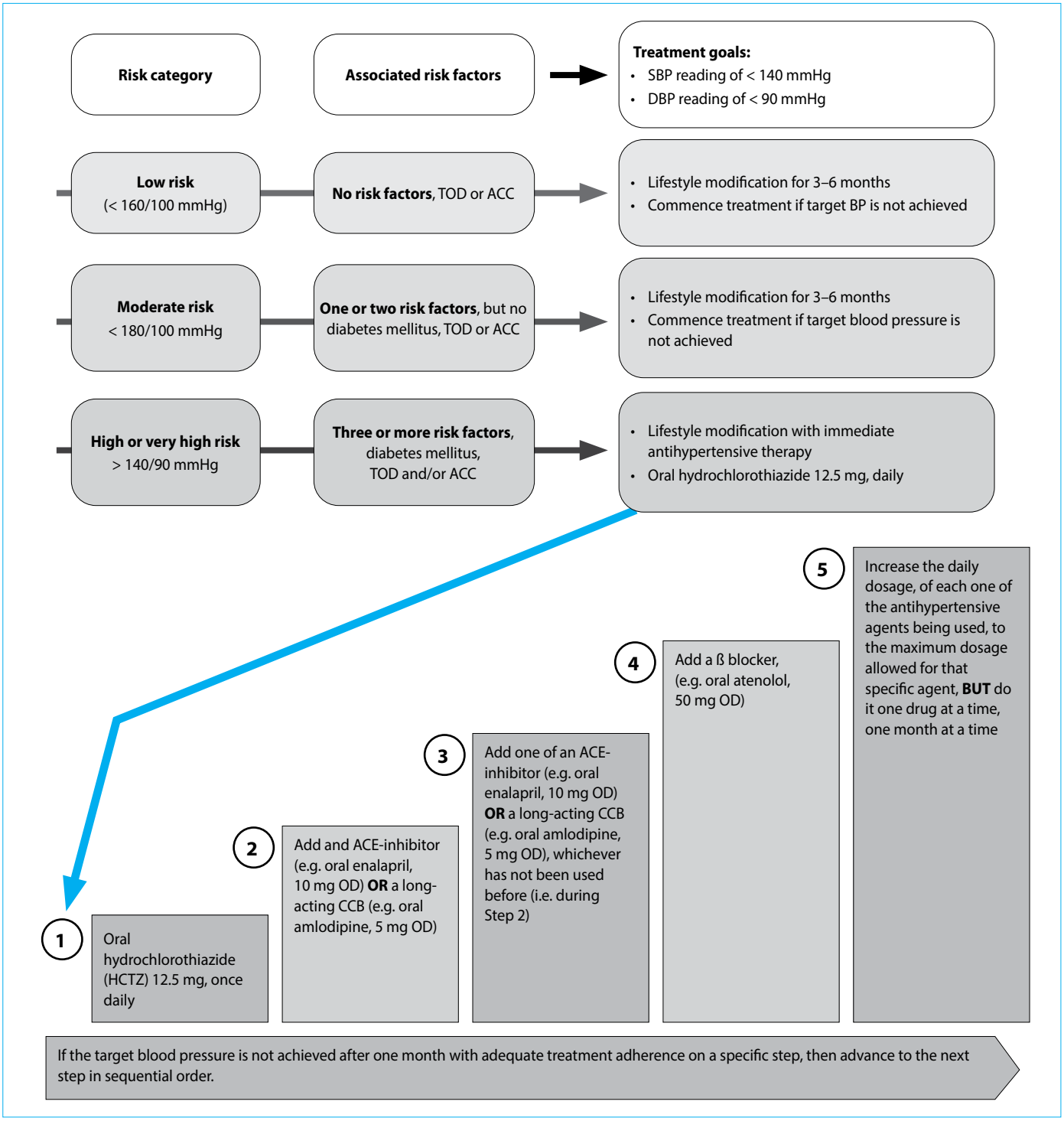

Figure 2: Standard treatment guideline for antihypertensive therapy according to the standard treatment guideline and essential medicines list for South Africa[31]

ACC – associated clinical condition, ACE – angiotensin-converting enzyme, CCB – calcium channel blocker, BP – blood pressure, DBP – diastolic blood pressure, OD – once daily, SBP – systolic blood pressure, TOD – target organ damage

- *Achieving and maintaining an ideal body weight:* The ideal body weight is a body mass index (BMI) of 18.5–24.9 kg/m.[23,24]
- *Limiting total sodium intake:* Sodium intake should be limited to < 2 400 mg/day or < 1 teaspoon of salt.[9,25,26]
- *Limiting alcohol intake:* Alcohol should be limited to two standard drinks per day for men and one standard drink per day for women and men of a lesser stature.[27]
- *Following the nutrition guidelines published by the World Health Organization (WHO):* The WHO guideline accentuates a diet that is low in total fat, with a high intake of fruit and vegetables (five portions per day), regular low-fat dairy products, fish rather than red meat, products that are low in saturated fat, a high intake of high-fibre wholegrain foods, low salt and the sparing use of sugar and sugar-containing foods.[28]

- *Partaking in regular, moderate-intensity exercise:* It is essential to exercise for at least 30 minutes on most or preferably all days of the week, e.g. brisk walking.[29,30]
- *Avoiding the use of all tobacco products:* All tobacco products should be avoided, including snuff.

Lifestyle treatments are highly recommended in all hypertensive patients, as this could improve BP control with the added benefit of reducing the use of medications.[2]

Pharmacological treatment

According to the South African hypertension guidelines, the following factors should be considered when selecting an antihypertensive:[14]

- The cost of the drug class.
- Patient-related factors, such as the presence of major risk factors, conditions favouring use and contraindications.
- Associated clinical conditions and target organ damage.

Figure 2 outlines the management of hypertension according to the standard treatment guidelines and *essential medicines list for South Africa***:** *hospital level*, *adults.*[31]

The following information is more specific to the JNC 8 guidelines.[2]

First-line and later-line treatment should be limited to four classes of medicine:

- Thiazide-type diuretics
- CCBs
- ACE inhibitors
- ARBs

Second- and third-line alternatives include higher dosages or a combination of:[2]

Thiazide-type diuretics

- CCBs
- ACE inhibitors
- ARBs

Numerous medications are now selected as later-line alternatives, such as [2]

- β-receptor blockers
- Loop diuretics
- α-receptor blockers
- Direct vasodilators
- Aldosterone antagonists
- α-1 blockers and β blockers
- Vasodilating β blockers
- Central α2-receptor agonists
- Peripherally acting adrenergic antagonists.

Table II provides an overview of available medicines in South Africa, and includes some management principles.[2,15,31]

Table II: Guideline for the management of high blood pressure in adults

Class of drug	Example of drug
First-line and second-line treatment should be limited to four classes of medicines Initiate one of these medications, either alone or in combination	
Angiotensin-converting enzyme inhibitors	• Captopril • Enalapril • Lisinopril • Perindopril • Quinapril • Ramipril • Trandolapril
Angiotensin II-receptor blockers	• Eprosartan • Candesartan • Lorsartan • Valsartan • Irbesartan • Telmisartan
Thiazide-type diuretics	• Hydrochlorothiazide • Indapamide
Beta blockers	• Atenolol • Bisoprolol • Metoprolol • Propranolol
Calcium-channel blockers	• Amlodipine • Diltiazem (extended-release)
Alpha and Beta blocking agents	• Carvedilol
If the BP goal is not achieved with the first drug of a particular class, the dosage of the initial drug should be titrated to the maximum recommended dosage to achieve the BP goal.[2] If the BP goal is not achieved with one drug from a particular class, a second drug should be added from the list above, and titrated up to the maximum recommended dose of the second drug to achieve the BP goal.[2] If the BP goal is not achieved with two drugs from a selected class, a third drug should be selected from the list above (different class), and it should be ensured that the combined use of angiotensin-converting enzyme inhibitors and angiotensin-receptor blockers is avoided.[2] The third drug should be titrated up to the maximum recommended dosage to achieve the BP goal. If all of the above medication fails, then a later-line alternative can be added from the list below.	
Later-line alternatives Add one of the following medications below to the therapy regimen	
Loop diuretics	• Bumetanide • Furosemide • Torsemide
Potassium-sparing diuretics	• Amiloride • Triamterene
Aldosterone-receptor blockers	• Eplerenone • Spironolactone
α blockers	• Doxazosin • Prazosin • Terazosin
Direct vasodilators	• Hydralazine
Peripherally acting adrenergic antagonists	• Reserpine

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ACEI - angiotensin converting enzyme inhibitor; ARB - angiotensin receptor blocker; BP - blood pressure; CCB - calcium channel blocker; RAAS - renin-angiotensin-aldosterone system

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When titrating a drug treatment, it is very important to maximise therapy by employing the following steps:[2]

- maximise the first medication before adding a second medication, or
- add the second medication before reaching the maximum dosage of the first medication, or
- start with two medication classes separately, or as a fixed-dose combination.

Recommendations

The following recommendations are necessary when selecting a medication for a patient.

Patients of African descent CKD should use calcium-channel blockers and thiazides alone or in combination, instead of ACE inhibitors, when initiating therapy. It was indicated in a single large trial, the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), that a thiazide-type diuretic was shown to be more effective in improving cerebrovascular heart failure and combined cardiovascular outcomes than an ACE inhibitor.[3233]A CCB was also tested, and the outcome was no different to that of a thiazide diuretic. In addition, a significant 51% increase in the risk of a stroke was seen in patients who used an ACE inhibitor as initial therapy, compared to a CCB.[2,33]

Regardless of ethnic background, patients with CKD should use an ACE inhibitor or ARB alone or in combination as first-line therapy, or in addition to first-line therapy. Mean arterial pressure and different targets were used according to age in the African American Study of Kidney Disease (AASK) and Modification of Diet in Renal Disease (MDRD) trials, and only a DBP goal was used in the Ramipril Efficacy In Nephropathy 2 (REIN-2) trial. Treatment to achieve a lower BP goal that significantly lowered kidney or cardiovascular disease end-points, compared to a goal of lower than 140/90 mm Hg, was not shown in any of the trials.[2,34,35]

CCBs and thiazide-type diuretics should be used in patients aged 75 years and older with impaired kidney function, rather than ACE inhibitors and ARBs, owing to the resultant risk of hyperkalemia, increased creatinine and further renal impairment.[2]

Conclusion

Hypertension is a haemodynamic disorder associated with a rise in peripheral vascular resistance, that can, in turn, lead to myocardial infarction, renal failure, strokes and death if not identified early and treated effectively. Guidelines used in diagnosing and managing hypertension include the JNC 7, JNC 8, the South African standard treatment guidelines, essential medicines list, and the South African hypertension guidelines. As part of the stepwise treatment in the management of hypertension, thiazide-type diuretics are still considered the initial first step, with an antihypertensive drug added according to the risk profile of the patient and/or the response to treatment.

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The role of probiotics in irritable bowel syndrome

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Abstract

Irritable bowel syndrome (IBS) is a complex gastrointestinal disorder. There is increasing evidence linking changes in the gastrointestinal microbiota and IBS. Probiotics are living organisms and studies have shown that probiotic treatment may have positive effects in the gastrointestinal tract of IBS patients. The mechanism of action of probiotics in IBS is complex. The aim of this review is to summarise the mechanisms of probiotics in the treatment of IBS.

Keywords: irritable bowel syndrome, complex gastrointestinal disorder, gastrointestinal microbiota, probiotics

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Introduction

Irritable bowel syndrome (IBS) is a common gastrointestinal disorder that is predominantly characterised by abdominal pain or discomfort associated with changes in bowel habit such as diarrhoea and constipation.[1,2] IBS is a non-fatal disease but the symptoms experienced negatively impact the quality of life of affected patients, which may ultimately result in societal economic burdens.[1] IBS has a worldwide prevalence of approximately 12 to 20% of the population and is almost 2–3 times more common in women than in men. It is, however, one of the most difficult GI disorders to manage. Despite pharmacologic approaches, the use of probiotics has become an attractive alternative to conventional medicines for the treatment of IBS considering their favourable safety profile and relatively low costs.[3,4]

Pathophysiology of IBS

Despite several studies, the pathophysiology of IBS is not clearly understood. The condition is suggested to be multifactorial with central and peripheral mechanisms linked to inherited, psychosocial and environmental factors.[1,5,6] The gut microbiota has emerged as a significant factor contributing to the patho-physiology of IBS.[4] Refer to Table I for a summary of possible central and peripheral factors.

Table I: Possible central and peripheral factors affecting IBS[1,5,6]

Central mechanisms	Peripheral mechanisms
• Altered brain-gut axis associated with a dysfunction of the GI autonomic nervous system • Genetic – mutation of SCN5A • Altered serotonin metabolism • Dietary influence – gluten and fermentable oligosaccharides, disaccharides, monosaccharides and polyols (FODMAPs)	• Altered gastrointestinal motility • Disturbances in the epithelial barrier integrity resulting in abnormal change in intestinal permeability • Local immune response disorder • Low grade inflammation • Post-infectious changes • Disordered bile salt metabolism • Chronic infections • Alterations of gut microbiota

Symptoms of IBS[5]

- Abdominal pain or discomfort
- Change in bowel habits (diarrhoea/constipation/or combination)
- Abdominal bloating
- Flatulence
- Extra-gastrointestinal symptoms such as headache, dizziness, sleep disorders, back pain, neck pain, fibromyalgia, dysmenorrhea, etc.

Diagnosis and classification

Since there are no objective tests to diagnose IBS, diagnosis is based on clinical symptoms as per the Rome IV criteria.[3,6]

IBS is classified into subtypes based on the bowel habit patterns:[3,6]

- C-IBS – IBS with predominant constipation
- D-IBS – IBS with predominant diarrhoea
- M-IBS – IBS with mixed constipation and diarrhoea
- U-IBS – unclassified IBS (These patients meet the diagnostic criteria for IBS, but bowel habits cannot be accurately classified into the above subtypes.)

Treatment options

The most common treatment options aim at treating the predominant symptoms experienced by the patient. A recommended dietary strategy is a diet low in fermentable oligosaccharides, disaccharides, monosaccharides and polyols (FODMAPs). However, diet modification or pharmacological treatment do not completely eliminate the symptoms necessitating the need for alternative approaches to improve symptoms of the patients.[5]

Clinical observation of symptoms developing after an infection has advocated that changes in the gut microbiome is a likely contributor to IBS. The bacterial overgrowth in the small intestine

often causes symptoms similar to those of IBS. Studies have also compared the gut microbiota of healthy controls to IBS patients and have suggested an altered microbiota profile in IBS. It has been found that the composition and activities of *Lactobacillus* and *Bifidobacterium* are severely compromised in IBS patients. Therefore, one of the approaches to treating IBS is the use of probiotics to correct the dysbiosis and stabilise the microbiota of the host.[6]

What are probiotics?

The term 'probiotics' has Greek origins and means 'for life'. The World Health Organization/Food and Agriculture Organization (WHO/FAO) defines probiotics as living microorganisms that, when administered in adequate amounts, contribute a health benefit to the host.[6,7]

The following conditions need to be fulfilled for a probiotic to be effective:[3]

- It must have demonstrated beneficial effect on the host
- It must not be pathogenic or toxic
- It must remain sustainable during use and storage
- It must have an adequately sizeable number of viable microorganisms per unit
- It must be able to maintain itself in the intestine, reproducing and surviving and having intraluminal activity

Probiotic classification

Probiotics are classified according to genus, species and strain. The therapeutic benefits of probiotics depend on all three and cannot be extended to other similar probiotics even if they may be of the same genus or species.[3,6]

The most widely studied probiotics species in the context of IBS are *Lactobacillus* and *Bifidobacterium* because of their numerical superiority and the number of aerobes vs anaerobes.[3,6]

Lactic acid bacteria (LAB) are often present in the human gut via ingestion of fermented milk products such as cheese, yoghurt and fermented cured meat by-products. The LABs have antimicrobial action and work to:[6]

- create an unsuitable environment for the growth of undesirable microorganisms
- compete for binding sites and nutrients to the intestinal epithelium
- produce products of toxic microbes for foreign microbes
- prevent pathogens from settling and feeding in the body

Probiotic effects in IBS

The efficacy of probiotics in IBS has been evaluated in several publications.[4]

The mechanism of action of probiotics in the human body is only partly understood.[6,7]

Probiotics have been found to have a beneficial effect on the gastrointestinal tract, such as:[3]

- decreasing bacterial overgrowth in the small intestine
- increasing the mass of beneficial bacteria in the gastrointestinal tract
- reversing the imbalance between the pro and anti-inflammatory cytokines
- normalise the motility of the digestive tract and visceral hypersensitivity
- reinforce the intestinal mucosal barrier
- some strains may modulate intestinal pain attacks by inducing the expression of the μ-opioid and cannabinoid receptors in the intestinal epithelial cells

Pathogen binding inhibition

Probiotics decrease the adherence of pathogenic bacteria on the epithelial cells and thereby reducing pathogenic bacterial translocations. Probiotics can regulate intraluminal fermentation and control growth of pathogenic bacteria by stimulating the secretion of defensins and bacteriocins and influence the adaptive immune system.[3]

Enhanced barrier function

Several factors, such as a mucous layer, secretory IgA, water and chloride secretion and the epithelial junctional adhesion complex, maintain the intestinal barrier function. Evidence suggests that disturbance of the intestinal barrier may contribute to the loss of immune tolerance of microbiota in the gut resulting in decreased immune response and development of IBS symptoms. There have been several experimental studies about the role of probiotics to maintain this barrier function. However, although probiotics have been shown to enhance the barrier function, the exact mechanism by which this occurs is still not known.[1,3]

Anti-inflammatory effects

Probiotics have demonstrated anti-inflammatory effects in some studies. Human studies and animal models have evaluated anti-inflammatory effects with specific probiotics. In an experimental rodent, *Lactobacillus reuteri* demonstrated a potential anti-inflammatory effect by inhibition of TNF-α-induced production of IL-8. Another experimental rodent study also showed that *Lactobacillus casei* can also significantly decrease TNF-α-release in ileal tissues. The anti-inflammatory effects of probiotics were also demonstrated in activity against cytokines and interferons in various other studies. In order to outline the precise role of probiotics in IBS, there needs to be additional trials to investigate the immunologic reaction of probiotics in humans and the correlation between IBS symptoms and immune cell activities.[1,3]

Colonic motility and transit

Colonic transit is significantly reduced with probiotics in IBS patients with predominant bloating. This effect on transit did not result in a worsening of bowel function.[1,3]

Effect on intestinal luminal environment

Supplements with probiotics could alter the intestinal luminal environment in IBS patients by:[1,3]

- preserving intestinal homoeostasis
- restoring the dysbiosis by the maintenance of luminal acidity
- inhibition of bacterial adherence
- producing anti-bacterial substances such as bacteriocin and defensin
- decrease in intracolonic gas from bacterial origin by increase in *Bifidobacteria* and *Lactobacilli* resulting in a decrease of *Clostridia* and *Veillonella*
- modification of the colonic metabolism of nutrient substrates to alter colonic transit and fluid fluxes
- decreased malabsorption of bile acids in diarrhoea predominant IBS. *Bifidobacteria* and *Lactobacilli* are capable of deconjugation and absorbing bile acids decreasing colonic secretion and mucosal permeability changes.

Changes in visceral hypersensitivity

A change in visceral perception and gut dysmotility are key contributors to symptoms of IBS. Visceral hypersensitivity is responsible for inducing abdominal pain in IBS patients, who generally show a lower threshold for discomfort compared with healthy controls. Studies have shown that *L. paracasei* inhibits visceral hypersensitivity association with inflammation in healthy mice in whom antibiotics have disturbed the bacterial microbiota. This study demonstrated a clear anti-inflammatory effect and also inhibition of SP staining (a marker of afferent pain pathways) which was increased after antibiotic treatment. In other experimental studies, *L. acidophilus* was shown to blunt visceral pain responses by increasing expression enterocyte opioid and cannabinoid receptors and by inhibiting sodium channels.[1,3,6]

Mono-strain probiotic vs multi-strain probiotic

A systematic review of recent randomised controlled trials by Dale et al., evaluating the effect of probiotic supplementation on symptoms in IBS patients, suggests a trend that multi-strain probiotic treatment had a tendency of a more beneficial effect in alleviating IBS symptoms compared to mono-strain probiotics or placebo.[2,5] A meta-analysis, by Ford et al., of randomised controlled trials published between 1946 and 2013, evaluated probiotics as a treatment option for IBS. The review concluded that probiotics had a beneficial effect on IBS symptoms and highlighted that the effect was more pronounced when using multi-strain probiotics. Another review and meta-analysis by Ford et al. was also cited which evaluated the efficacy of probiotics, prebiotics and antibiotics on IBS and was found to support their previous publication. They concluded that specific combinations of probiotics or specific species and strains, appeared to have beneficial effects on general IBS symptoms and abdominal pain.[2,5]

Conclusion

There is reasonable evidence that probiotics play a beneficial role in IBS patients, improving the overall symptom response and quality of life compared to placebo. Given their impressive safety profile, probiotics are certainly worth considering. Probiotic treatment seems appropriate in the context of dysbiosis as the pathogenesis of IBS, as it restores the intestinal microbiota. Clinical studies and systemic meta-analyses have also shown that some strains of probiotics have valuable outcomes in certain patients. Supplementation with multi-strain probiotics has also shown to be more beneficial than mono-strain probiotics. In order for probiotics to be an accepted treatment option, there needs to be clarity on which species are effective, on which subset of patients probiotics are effective, whether single or mixed species are indicated and dosage and duration of treatment. Collectively though, probiotics may have a favourable therapeutic role in IBS patients.

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An update on oral opioids for the management of pain

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Abstract

Pain is an uncomfortable experience associated with various pathologies, including cancer. Advances in medical science have allowed for the development of effective analgesics, and opioids are the most effective in combating pain. Concerted efforts from healthcare workers and an understanding of the characteristics of different opioid drugs are cardinal in the effective use of these chemical entities in the effective management of pain. This short review focuses on discussing the currently available opioids for the management of pain.

Keywords: pain, opioids

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Pain

Definition

According to the International Association on the Study of Pain, pain can be defined as "an unpleasant sensory and emotional experience associated with, or resembling that associated with actual or potential tissue damage".[1] Although the acknowledgement of pain as a pathological entity in its own right is debated,[2] it poses a huge burden in the healthcare system.[3] The continuous rehabilitation of patients with pain sensations, hinders them from conducting day-to-day activities, which has a detrimental effect on the economy.[3] According to the Global Burden of Disease Study in 2016, pain and pain-related pathologies are a leading cause of disease burden and disability.[4] The study further reaffirmed that the global burden caused by pain is increasing, as 1.9 billion people were found to have recurrent-type headaches.[4]

Types of pain

Pain can be classified according to the pattern of occurrence's duration into acute and chronic pain.[3] Acute pain is temporary, and typically results from specific stimulus (chemical, thermal and mechanical). The four classic features of acute pain are that it is time-limited, has a triggering event, has a sudden onset, and can potentially develop into a pathologic condition.[5] In contrast, chronic pain persists for three to six months beyond the expected time frame. Chronic pain can either be intermittent or continuous and may persist regardless of the presence of any obvious stimuli or pathology. Cancer and associated surgery, chemotherapy or radiotherapy can result in a debilitating amount of pain, known as chronic malignant or cancer pain.[6] On the other hand, chronic pain resulting from other pathologies is known as chronic non-cancer or non-malignant pain.[6]

Alternatively, symptoms, mechanisms and syndromes can be used to classify pain into nociceptive, neuropathic, and inflammatory pain.[7] Neuropathic pain occurs as a response to actual or potential damage to visceral and somatic, non-neural tissue. Such stimuli activate nociceptors (Aδ- and C fibres), which are ultimately responsible for detecting chemical, mechanical and thermal stimuli.[3] Neuropathic pain is associated with nerve damage or nerve impairment and is commonly associated with allodynia – a central pain sensitisation that happens due to repetitive non-painful stimulation of receptors. Such sensitisation triggers a pain response to stimuli that normally does not provoke pain.[3] The inflammatory process is a natural response to tissue damage, that serves to remove necrotic cells and initiate the tissue healing process.[8] Upon tissue injury, neutrophils gather at the site of inflammation, followed by the release of chemical mediators. Such chemical mediators interact with nociceptors in the inflamed area, leading to inflammatory pain. Inflammation can result in allodynia, hyperalgesia or sympathetic maintained pain.[8]

Pain pathways

Pain is perceived in three stages, namely-transduction, transmission, and modulation.[3] Following the presence of a noxious stimuli, nociceptors in the peripheral primary afferent fibres located alongside the spinal cord's dorsal root ganglia are activated. The transmission of pain signals occurs via two routes, the ascending and the descending pathways.[3] Transduction and transmission are major events in the ascending pathway. During transduction, noxious stimuli are converted from chemical events into electrical events that get subsequently transduced in the form of chemical neurotransmitters (substance P, glutamate, and other excitatory neurotransmitters) onto primary and secondary neurons in the spinal cord. Following transduction, electrical events are transmitted along the neuronal pathways, through the thalamus into the somatosensory cortex of the brain, leading to the perception of pain.[3]

In the descending pathway, spinothalamic nerves go downwards from the midbrain brain periaqueductal grey (PAG) via the spinal

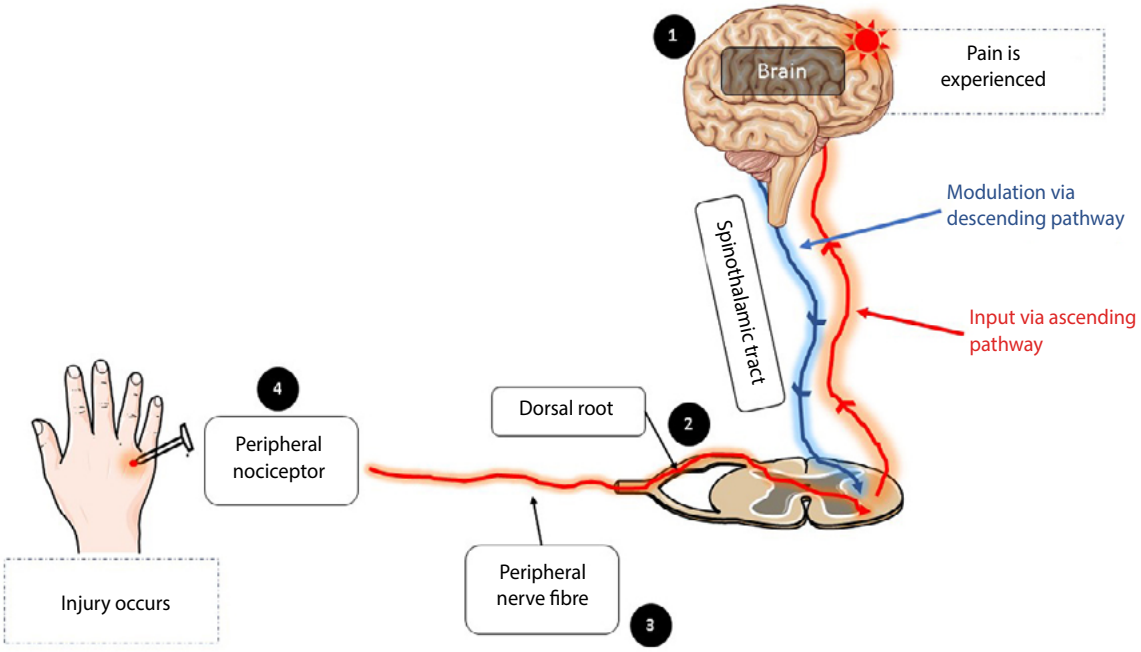

Figure 1: Adapted diagram showing the pain pathways and various targets for treatment options.[9] The target sites of the various treatment options are: (1) Opioids and α_2-adrenergic agonists in the brain; (2) Opioids, local anaesthetic agents and α_2-adrenergic agonists at the dorsal horn; (3) Local anaesthetics peripheral nerve fibre; (4) Local anaesthetics agents and non-steroidal anti-inflammatory drugs at peripheral nociceptors.

cord to the effector organs. Some AB fibres from peripheral tissues are also involved in the descending pathway.[3] The modulation of pain is facilitated through the inhibition of the spinothalamic tract by large fibres that impinge these neurons. Inhibition of the AB fibres stimulates the release of Mer-enkephalin from interneurons in the spinal cord.[3] Additionally, serotonergic fibres arising from the nucleus magnus raphe (NMR) release serotonin and norepinephrine fibres arising from the locus ceruleus (LC) release norepinephrine. When both these neurotransmitters are released, they inhibit the dorsal spinal neurons that transmit pain to the supraspinal structures. The pain pathways and various therapeutic targets are briefly outlined in Figure 1.

The elucidation of pain pathways and the physiology underlying pain has allowed for the development of analgesic agents. In the 1980s, the World Health Organization (WHO) developed a three-step ladder that has been used as a guideline for the pharmaceutical management of pain.[10] A major limitation of the initial guidelines is that they did not incorporate non-pharmacological interventions. The lack of consideration of alternative non-pharmacological strategies such as minimally invasive treatment can result in the irrational use of pharmacological agents (especially opioids), leading to unwanted side effects. As such, a revised four-step ladder that incorporates non-pharmacological treatments in conjunction with opioids and other analgesics has been proposed (Figure 2).[10]

As shown in Figure 2, opioids are critical in the management of

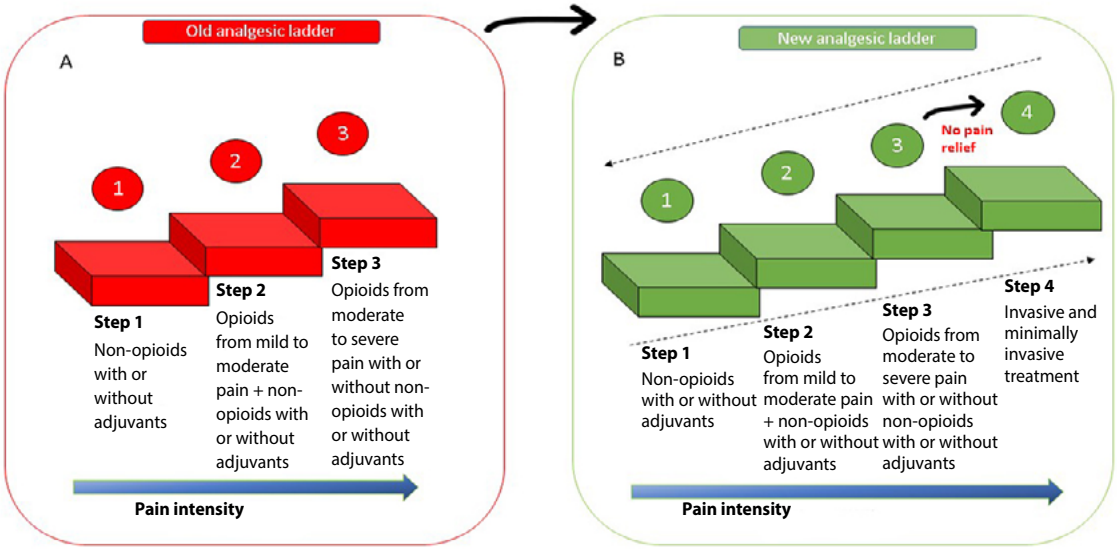

Figure 2: Transition from the initial WHO (A) three-step ladder to the (B) four-step ladder used as a guideline for the treatment of pain[10]

mild to moderate and severe pain. However, abuse and use-dependence preclude the optimal use of opioids in the management of pain.[11] This review aims to discuss oral opioids in the management of pain.

Mechanism of action of opioids

Opioid receptors

Opioid receptors are G protein-coupled receptors that are widely distributed in the brain, spinal cord, gastrointestinal tract, and skin.[12] There are three types of opioid receptors, the delta (δ), kappa (κ) and mu (μ) receptors.[13] Opioids and many metabolites bind to opioid receptors in the brain, leading to euphoria, respiratory depression and analgesia.[12] Although all three opioid receptors elicit an analgesic effect on the brain, they individually have distinct outcomes and distribution in various brain regions.[12] The μ receptors are found in the PAG, cerebral cortex, and thalamus, where they bind to endorphins and stimulate euphoria, use dependence and respiratory depression.[14] The δ receptors located in the PAG and hypothalamus bind to dynorphins to stimulate sedation and dysphoric effects.[14] The κ receptors are found in the basal ganglia, where they bind to enkephalins to induce an anxiolytic effect.[14]

Mechanism of opioid analgesia

Upon binding to receptors, opioids can modulate intracellular calcium disposition and alter protein phosphorylation.[15] Opioids exert their analgesic activity both pre- and postsynaptically. At the presynaptic level, they block the voltage-gated Ca^{2+} channels on afferent fibres. Consequently, neurotransmitters that contribute to nociception (e.g., substance P, serotonin, and glutamate) are reduced, leading to analgesia.[15] Postsynaptically, opioids result in the opening of K^{+} channels, leading to hyperpolarisation of neurons. This leads to decreased neuronal excitability, which ultimately results in analgesia.[15] Some opioids can inhibit serotonin uptake through various mechanisms, therefore, caution should be taken when administering opioids to patients already taking medication with serotonergic activity. Additionally, some opioids such as methadone act on the N-methyl-D-aspartate (or NMDA) receptors, where they antagonise glutamate. This is possibly why methadone has superior efficacy in combating neuropathic pain, compared to other opioids.[16]

Morphine

Morphine is one of the several important alkaloids derived from the poppy plant, *Papaver somniferum*.[17] The drug has remarkable efficacy in the relief of moderate to severe pain and serves as a standard by which other analgesic agents are measured.[17] Preoperatively, morphine is used to reduce anxiety, reduce the anaesthetic dose, and cause sedation.[17] Due to its vasodilatory and bradycardic activity, morphine is used in the treatment of myocardial infarction. Tolerance, physical dependence, respiratory depression, gastrointestinal effects at therapeutic doses are common side effects associated with morphine.[17] As a result, morphine is subject to abuse and is tightly controlled by national and international regulatory agencies.[17]

Hydromorphone

Hydromorphone is a hydrogenated semi-synthetic opioid agonist, with potent activity on the μ receptors, and weak activity on the κ opioid receptors.[6] Hydromorphone is used in the treatment of moderate to severe pain. Due to alterations (a keto-group instead of the hydroxyl group at position 6), hydromorphone is 5 to 10 times more potent compared to morphine, and has better distribution to the central nervous system, leading to enhanced analgesic activity.[18]

Although injections, oral solutions, suppositories and powder formulations are available in the USA, OROS®, a controlled-release oral hydromorphone formulation is the only formulation currently approved in the South African market (4 and 8 mg Jurnista®).[6] This formulation allows for the maintenance of constant plasma concentration levels of the drug, ensuring prolonged analgesia. In comparison to morphine, hydromorphone is better absorbed orally, and has a faster onset but shorter duration of action. This can be used as an advantage when trying to achieve short-term analgesia.[18] Compared to morphine and other opioids, hydromorphone has a similar side effect profile, however, euphoria, nausea, vomiting and constipation may be less pronounced.[6,19]

Oxycodone

Oxycodone is a semi-synthetic opioid used to treat moderate to severe pain. Oxycodone has strong agonistic activity at the κ receptors, and to a lesser degree, at the μ receptor.[20] Despite the use of oxycodone in combination with paracetamol for many years, it has been demonstrated that oxycodone may be safe and efficacious when used alone.[6] There are two main formulations of oxycodone; an immediate-release (conventional) preparation, and an extended-release preparation.[21] The conventional formulation can be used orally for the treatment of moderate to severe pain in conditions such as bursitis, dislocations, and postoperative, post-extraction and postpartum pain.[6] This formulation is available in oral capsules, with doses of 5, 10 and 20 mg.[6] It has a 10–15 minute onset of action, and a 3–6 hours duration of action.[6] The extended-release preparation is used in the treatment of moderate to severe pain, where continuous analgesia is required. This formulation maybe be advantageous in the treatment of cancer-associated pain, and for treating pain during rehabilitation.[6] The preparations for the extended-release formulation may be available in 10, 20, 40 and 80 mg strength. This formulation has a 1-hour onset of action and analgesic action can last up to 12 hours.[6]

Fentanyl

Fentanyl is a narcotic analgesic that was developed in the 1950s and 1960s in an effort to produce opioid analgesics with greater potency, analgesic efficacy, and fewer side effects compared to morphine.[22] Only injections and the transdermal formulations are registered in South Africa, however, a transmucosal immediate-release (TIRF) formulation is available in other countries.[6] These

short-acting fentanyls are delivered through sublingual (100, 200, 300, 400, 600 and 800 µg) and buccal tablets (100, 200, 400, 600 and 800 µg), intranasal sprays (100 µg/100 µL and 400 µg/100 µL) and troche/lozenges (200, 400, 600, 800, 1 200 and 1 600 µg).[6] These formulations are primarily indicated for the treatment of breakthrough cancer pain, in patients that are routinely taking other opioids for pain.[23] To mitigate the potential of abuse, misuse and addiction, TIRF preparations are administered to selected patients through the Risk Evaluation and Mitigation Strategy program of the United States Food and Drug Administration.[6]

Buprenorphine

Buprenorphine is an opioid derivative with higher potency (25–40 times) and has longer lasting analgesic effects compared to morphine.[24] The drug acts as a partial agonist at µ receptors, where it binds with great affinity but with low intrinsic activity.[24] It also has partial agonist effects at the κ receptors and is an antagonist at the delta receptors.[6] The rate of dissociation from the µ-receptors is slow, which results in an antagonistic effect to any other opioids that may be co-administered with buprenorphine.[24] Due to such antagonistic activity, buprenorphine is an effective treatment for opioid use disorder.[25] Approved oral preparations include a buprenorphine/naloxone tablet (2/0.5, 0.7/0.18, 1.4/0.36, 2.9/0.71, 5.7/1.4, 8.6/2.1, 11.4/2.9 mg/mg).[25] Constipation, asthenia, drowsiness, nausea and vomiting, fainting and dizziness, orthostatic hypotension, sweating, headaches, and insomnia are the most common side effects associated with buprenorphine use.[6]

Tilidine

Nortilidine, the main active metabolite of the opioid drug tilidine, has a high affinity to µ-receptors, but not to δ- or κ-receptors, and has typical opioid effects and side effects.[26] Tilidine is indicated for postoperative and severe pain, and is usually considered prior to stronger opioids.[27] Tilidine is available as Valoron® drops for use undiluted perilingually or sublingually with or without sugar.

Tramadol

Tramadol is a centrally acting opioid analgesic that has a multimode of action. In addition to acting as an agonist at the µ receptors, tramadol also acts as a noradrenaline reuptake inhibitor.[28] Tramadol is indicated for the treatment of moderate to severe pain, and does not cause much serious adverse side effects when compared with other opioids like morphine.[28] Although other formulations of tramadol exist, oral preparations include; Tramal® 50 mg capsules and 100 mg sustained-release tablets, Austell-tramadol® 50 mg capsules, Dolatram® and Domadol® 50 mg capsules, Tramahexal® 50 mg capsules, and Tramaspen® and Tramazac® 50 mg capsules. Tramadol is also available in combination with paracetamol as Tramacet® at a dose of 325 mg/37.5 mg respectively.[28]

Tapentadol

Tapentadol is a newer opioid that has dual activity as a µ receptor agonist, and a noradrenaline reuptake inhibitor.[6] In comparison to other opioids like morphine, tapentadol resembles tramadol the most and similar multimode mechanism of action. However, in contrast with tramadol, tapentadol additionally inhibits the reuptake of norepinephrine. Consequently, tapentadol has an additional anti-nociceptive activity at the descending pathway, by reducing the transmission of pain signals to the brain.[29] Although not currently registered in South Africa, tapentadol is available in the form of tablets and film-coated tablets with modified release patterns under the trade name Palexia.[30]

Conclusion

Pain is a devastating experience and has a detrimental effect on patients suffering from it, and poses a huge burden on the healthcare system. Fortunately, advances in medical science have allowed for the elucidation of the mechanisms driving pain, which has led to the development of effective analgesics. Opioids form a cardinal part of the pain treatment ladder proposed by the WHO, as they are effective treating moderate to severe pain. However, due to the wide distribution of opioid receptors, opioid drugs are associated with various side effects, and the most concerning ones are use dependence and addiction. This short review highlighted the different oral opioids available. Each opioid drug has its unique mechanism of analgesic action and side effect profile. Where possible, the use of opioid analgesics should be limited when invasive and minimally invasive approaches can result in analgesia. This will strengthen the patient's experience of symptomatic relief, while side effects are avoided.

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Focus on....

Xultophy®

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Type 2 diabetes is a heterogeneous disease characterised by chronic hyperglycaemia with variable degrees of insulin deficiency and resistance. Most patients with type 2 diabetes also have comorbidities, such as obesity, cardiovascular disease, chronic renal disease and heart failure.[1]

Normalising blood glucose levels is essential in preventing micro- and macrovascular complications and slowing disease progression.[1] Diabetes guidelines recommend tailoring the therapy according to the risks/benefits of the individual patient.[1] Where initiation of insulin is indicated, basal insulin is most often the preferred option.[1] For many type 2 diabetics, by the time basal insulin is initiated, an average of 9.2 years have passed since diagnosis.[2] This also coincides with an average glycated haemoglobin (HbA_{1c}) of 9.5%.[2] Where basal insulin has been titrated to acceptable levels and HbA_{1c} levels remain above target, consideration may be given to advancing treatment to combination injectable therapy.[3]

Xultophy® combines insulin degludec and liraglutide, a glucagon-like peptide 1(GLP-1) receptor agonist, in one pre-filled syringe.[4] Insulin degludec and liraglutide have been produced in *Saccharomyces cerevisiae* by recombinant DNA technology.[4]

Indications

Xultophy is indicated for the treatment of adults with type 2 diabetes mellitus to improve glycaemic control added to one or more oral hypoglycaemic medicines.[4]

Liraglutide is indicated to reduce the risk of major adverse cardiovascular events in adults with type 2 diabetes at high cardiovascular risk.[4] The effectiveness of Xultophy® on reducing the risk of cardiovascular events in adults with type 2 diabetes mellitus has not been established.[4]

Pharmacokinetics

Once-daily dosing of Xultophy® achieves steady-state concentration of insulin degludec and liraglutide after 2-3 days.[4] Both insulin degludec and liraglutide are extensively bound to plasma proteins.[4] Degradation of insulin degludec is similar to human insulin. Liraglutide is metabolised in a similar manner to large proteins without a specific organ being identified as a major route of elimination.[4]

The half-lives (t1/2) of insulin degludec and liraglutide are approximately 25 hours and 13 hours, respectively.[4]

Dosing

One 3 ml pre-filled syringe contains 300 units insulin degludec and 10.8 mg liraglutide.[4]

Xultophy® is administered as dose steps.[4] One dose step contains 1 unit of insulin degludec and 0.036 mg of liraglutide.[4] Xultophy® is administered subcutaneously once daily, preferably at the same time of each day.[4]

Table I: Recommended starting dose of Xultophy®:[4]

Add-on to oral glucose-lowering medicinal products	Transfer from GLP-1 receptor agonist	Transfer from any insulin regimen that includes a basal insulin component
10 dose steps Xultophy® can be added to existing oral antidiabetic therapy	**16 dose steps** Therapy with GLP-1 receptor agonists should be discontinued prior to initiation of Xultophy®	**16 dose steps** Other insulin regimens should be discontinued prior to initiation of Xultophy®

Table II: Xultophy® use in special populations (adults):[4]

Elderly populations (65 years)	Renal impairment	Hepatic impairment
Can be used in elderly patients and the dose should be adjusted on an individual basis.	The dose should be adjusted on an individual basis in patients with mild, moderate, or severe renal impairment. Xultophy® is not recommended for patients with end-stage renal disease.	When Xultophy® is used in patients with hepatic impairment, glucose monitoring is to be intensified and the dose adjusted on an individual basis.[4]

Consider XULTOPHY®
for your patients not optimally controlled on multiple daily injections

Xultophy®
insulin degludec/liraglutide
[rDNA origin] injection

Images shown are models, not real patients.

Reference: 1. Xultophy® Professional Information.

Scheduling status: S4 **Name of the medicine:** Xultophy®. **Qualitative and quantitative composition:** Each mℓ of solution contains 100 units insulin degludec and 3,6 mg liraglutide in a pre-filled pen. **Therapeutic indications:** Xultophy® is indicated for the treatment of adults with type 2 diabetes mellitus to improve glycaemic control added to one or more oral hypoglycaemic medicines. Liraglutide, a component of Xultophy®, is indicated to reduce the risk of major adverse cardiovascular events in adults with type 2 diabetes mellitus at high cardiovascular risk. However, the effectiveness of Xultophy® on reducing the risk of cardiovascular events in adults with type 2 diabetes mellitus has not been established. **Posology and method of administration:** Xultophy® is given once daily by subcutaneous administration and can be administered at any time of the day, preferably at the same time of the day. Injection sites should always be rotated within the same region in order to reduce the risk of lipodystrophy and cutaneous amyloidosis. Patients who forget a dose are advised to take it upon discovery and then resume their usual once-daily dosing schedule. A minimum of 8 hours between injections should always be ensured. This also applies when administration at the same time of the day is not possible. Xultophy® is to be dosed in accordance with the individual patient's needs. It is recommended to optimise glycaemic control via dose adjustment based on fasting plasma glucose. Xultophy® is administered as dose steps. The pre-filled pen can provide from 1 up to 50 dose steps in one injection in increments of one dose step. The maximum daily dose is 50 dose steps. The starting dose of Xultophy® as add-on to oral anti-diabetes drugs (OADs) is 10 dose steps and 16 dose steps when transferring from GLP-1 receptor agonist or any insulin therapy regimen. Close glucose monitoring is recommended during the transfer and in the following weeks when transferring from either GLP-1 receptor agonist or any insulin therapy regimen. In elderly patients, in patients with mild, moderate or severe renal impairment and hepatic impairment, glucose monitoring should be intensified and the dose adjusted on an individual basis. Xultophy® cannot be recommended for use in patients with end-stage renal disease. Xultophy® is not to be used in children/adolescents. **Contraindication:** Hypersensitivity to either or both active substances, i.e. insulin degludec and liraglutide or to any of the excipients, Type 1 diabetes mellitus, diabetic ketoacidosis, pancreatitis, pregnancy and lactation. **Special warnings and precautions for use:** Xultophy® should not be used in patients with type 1 diabetes or for the treatment of diabetic ketoacidosis. Too high dose, omission of a meal, or unplanned strenuous physical exercise may lead to hypoglycaemia. In combination with sulphonylurea, the risk of hypoglycaemia may be lowered by a reduction in the dose of sulphonylurea. Patients must be advised to take precautions to avoid hypoglycaemia while driving. Inadequate dosing and/or discontinuation of anti-diabetic treatment may lead to hyperglycaemia and potentially to hyperosmolar coma. Skin and subcutaneous tissue disorders: Patients must be instructed to perform continuous rotation of the injection site to reduce the risk of developing lipodystrophy and cutaneous amyloidosis. There is a potential risk of delayed insulin absorption and worsened glycaemic control following insulin injections at sites with these reactions. A sudden change in the injection site to an unaffected area has been reported to result in hypoglycaemia. Blood glucose monitoring is recommended after the change in the injection site from an affected to an unaffected area, and dose adjustment of antidiabetic medications may be considered. When using Xultophy® in combination with thiazolidinediones and insulin medicines, patients should be observed for signs and symptoms of heart failure, weight gain and oedema. Thiazolidinediones should be discontinued if any deterioration in cardiac symptoms occurs. Acute pancreatitis has been observed with the use of GLP-1 receptor agonists. Patients should be informed of the characteristic symptoms of acute pancreatitis. If pancreatitis is suspected, Xultophy® should be discontinued; if acute pancreatitis is confirmed, Xultophy® should not be restarted. In the absence of other signs and symptoms of acute pancreatitis, elevations in pancreatic enzymes alone are not predictive of acute pancreatitis. Thyroid adverse events, such as goitre has been reported in clinical trials with liraglutide and in particular in patients with pre-existing thyroid disease. Xultophy should therefore be used with caution in these patients. There is no experience with Xultophy® in patients with inflammatory bowel disease and diabetic gastroparesis. Xultophy® is not recommended in these patients. Signs and symptoms of dehydration, including renal impairment and acute renal failure, have been reported in clinical trials with GLP-1 receptor agonists including liraglutide. Patients must always check the pen label to avoid accidental mix-ups with other injectable diabetes medicinal products. Transfer to Xultophy® from doses of basal insulin <20 and >50 units has not been studied. There is no therapeutic experience in patients with congestive heart failure New York Heart Association (NYHA) class IV and Xultophy® is therefore not recommended for use in these patients. **Interaction with other medicines and other forms of interaction:** Substances that may reduce the Xultophy® requirement: Anti-diabetic products, monoamine oxidase inhibitors (MAOI), beta-blockers, angiotensin converting enzyme (ACE) inhibitors, salicylates, anabolic steroids and sulphonamides. Substances that may increase the Xultophy® requirement: Oral contraceptives, thiazides, glucocorticoids, thyroid hormones, sympathomimetics, growth hormones and danazol. Beta-blockers may mask the symptoms of hypoglycaemia. Octreotide/lanreotide may either increase or decrease the Xultophy® requirement. Alcohol may intensify or reduce the hypoglycaemic effect of Xultophy®. **Fertility, pregnancy and lactation:** Xultophy® should not be used during pregnancy. If a patient becomes pregnant, treatment with Xultophy® should be discontinued. Xultophy® should not be used during breast-feeding. **Undesirable effects:** Hypoglycaemia, decreased appetite, nausea, diarrhoea, vomiting, constipation, dyspepsia, gastritis, abdominal pain, gastroesophageal reflux disease, abdominal distension, injection site reaction, urticaria, hypersensitivity, dehydration, eructation, flatulence, rash, pruritus, lipodystrophy and increased heart rate, anaphylactic reaction, pancreatitis, peripheral oedema, fatigue, cholelithiasis, cholecystitis, increased lipase and increased amylase. Post-marketing sources: cutaneous amyloidosis. Skin and subcutaneous tissue disorders: Lipodystrophy (including lipohypertrophy, lipoatrophy) and cutaneous amyloidosis may occur at the injection site and delay local insulin absorption. Continuous rotation of the injection site within the given injection area may help to reduce or prevent these reactions Increased heart rate: In the LEADER trial, no long-term clinical impact of increased heart rate on the risk of cardiovascular events was observed with liraglutide (a component of Xultophy). **Overdose:** Hypoglycaemia may develop if a patient is dosed with more Xultophy® than required: Mild hypoglycaemic episodes can be treated by oral administration of glucose or other products containing sugar. Severe hypoglycaemic episodes, where the patient is not able to treat himself, can be treated with glucagon (0,5 to 1 mg) given intramuscularly or subcutaneously. **Reg. No.:** 50/21.13/0985

For full prescribing information, refer to the Professional Information approved by the Regulatory Authority.

Novo Nordisk (Pty) Ltd. Reg. No.: 1959/000833/07. 150 Rivonia Road, 10 Marion Street Office Park, Building C1, Sandton, Johannesburg, 2196.
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novo nordisk®

Xultophy® is dosed according to the patient's individual needs. It is recommended that fasting plasma glucose levels determine the dose adjustment needed to optimise glycaemic control.[4]

Efficacy

Insulin degludec, a basal insulin, forms soluble multi-hexamers upon subcutaneous injection.[4] This results in a depot that releases the insulin degludec continuously. The insulin degludec is slowly absorbed into the circulation, leading to a flat and stable glucose lowering effect with a low day-to-day variability in insulin action.[4] Insulin degludec binds to human insulin receptors and results in the same pharmacological effects as human insulin.[4]

Liraglutide, a GLP-1 analogue with 97% sequence homology to human GLP-1, binds and activates the GLP-1 receptor.[4] Glucagon-like peptide 1 receptor agonists (GLP-1 RAs) mimic incretins in that they lower fasting plasma glucose and postprandial glucose via stimulation of endogenous insulin and inhibition of glucagon secretion.[2] Body weight and body fat mass are also reduced by liraglutide through mechanisms involving reduced hunger and lowered energy intake.[4]

A phase 3, multinational, open-label, randomised clinical trial in 557 patients compared the effect of insulin glargine up-titration versus insulin degludec/liraglutide on glycated haemoglobin levels in patients with uncontrolled type 2 diabetes.[5] The results showed that "among patients taking glargine and metformin, treatment with degludec/liraglutide compared with up-titration of glargine resulted in noninferior HbA_{1c} levels." Secondary analyses indicated "greater HbA_{1c} level reduction after 26 weeks of treatment."[5]

Prandial insulin is sometimes initiated in patients with uncontrolled type 2 diabetes on basal insulin. A phase 3b, randomised trial in 506 type 2 diabetes patients compared efficacy and safety of IDegLira (insulin degludec 100 units/ml and liraglutide 3.6 mg/ml in a pre-filled syringe) versus basal-bolus insulin therapy in patients with type 2 diabetes uncontrolled on metformin and basal insulin.[2] The authors concluded that, in patients with uncontrolled type 2 diabetes on IGlar U100 and metformin, "IDegLira treatment elicited HbA_{1c} reductions comparable to basal-bolus, with statistically superior lower hypoglycaemia rates and weight loss versus weight gain."[2]

An open-label, phase 3b, randomised controlled trial involving 1 012 patients compared the durability of insulin IDegLira to IGlar U100 as initial injectable therapy in patients with type 2 diabetes.[7] Durability was defined as "one that requires fewer interventions over time compared with other treatments."[7] Fewer interventions benefit the diabetic patient in that there is a reduced risk of exposure to hyperglycaemia, possible simplification of regimens needed to maintain glycaemic goals, as well as a positive influence on the patients' perception of how their disease is managed.[7] The authors concluded that IDegLira "showed greater durability than IGlar U100 in reaching and maintaining patients at glycaemic goals for longer, thereby minimising the need for additional therapy, while also reducing the side-effects often associated with insulin-only therapy."[7]

Safety

Adverse effects

The most common adverse reactions reported during treatment with Xultophy® include hypoglycaemia and gastrointestinal adverse reactions.[4]

Warnings and special precautions

Xultophy® should not be used in patients with type 1 diabetes or for the treatment of diabetic ketoacidosis.[4]

Endocrine and metabolic

Risk of hypoglycaemia, hyperglycaemia, hypokalaemia.[6]

Skin and subcutaneous tissue disorders

Continuous rotation of the injection site should be performed in order to prevent lipodystrophy and cutaneous amyloidosis.[4]

Gastrointestinal

Acute pancreatitis has been reported with GLP-1 receptor agonists, including liraglutide. Patients should be monitored for pancreatitis and the product should be discontinued if suspected and not restarted if confirmed.[4]

GLP-1 RAs, including liraglutide, have a potential risk of dehydration associated with gastrointestinal side-effects.[4]

Drug interactions

Interaction studies with Xultophy® have not been performed.[4] A number of substances may affect glucose metabolism, thereby necessitating an increase or reduction in the dose of Xultophy®.[4] Glucose monitoring and dose adjustment should be made on an individual basis.[4]

Liraglutide delays gastric emptying to a small extent, and therefore there is a possibility that it may affect the absorption of concomitant oral medications.[4]

Important prescribing points

- Close glucose monitoring is recommended when transferring from another regimen to Xultophy®. It is also advised that close glucose monitoring be intensified when Xultophy® is administered to the elderly, as well as renally and hepatically impaired individuals.[4]
- A change in insulin regimen may affect glycaemic control and close glucose monitoring is recommended.[6]
- To reduce the risk of hypoglycaemia when Xultophy® is added to sulphonylurea therapy, a reduction in the dose of the sulphonylurea should be considered.[4]
- When switching to Xultophy® from a long-acting GLP-1 receptor agonist, Xultophy® should be initiated at the time when the

next dose of long-acting GLP-1 receptor agonist would have been taken.[4]

- Patients on thiazolidinediones and insulin products should be observed for signs and symptoms of heart failure, weight gain and oedema.[4] Thiazolidinediones should be discontinued if any deterioration in cardiac symptoms occurs.[4]
- Xultophy® should be administered once daily, preferably at the same time each day. If a patient forgets a dose, it should be taken upon discovery and then the once-daily schedule resumed. A minimum of 8 hours between injections should always be ensured.[4]
- Special precaution needs to be taken to prevent medication and dosing errors.[4]

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Presidential report 2022

Shawn Zeelie

President, SAAHIP

Shawn Zeelie

I am pleased to present the annual report sharing the SA Association of Hospital and Institutional Pharmacists (SAAHIP's) activities and achievements for 2021–2022.

National Executive Committee

Shawn Zeelie – National President	Thandeka Njapha (KwaZulu-Natal Coastal)
Kaajal Chetty – Vice President	Pearl Lentsoane (Northern Gauteng)
Hannes Stegmann – Honorary Treasurer	Rhulani Maluleke (Limpopo)
Nhlanhla Mafarafara – National Secretary	Armand Algra (North-West)
Refiloe Mogale – Past President	Vanessa Kreusch (Eastern Cape)
Rashmi Gosai (Southern Gauteng)	Alex Wehmeyer (co-opted)
Carrie de Beer (Western Cape)	Lourens van der Merwe (co-opted)
Vusi Dlamini (KwaZulu-Natal Inland)	Thanushya Pillaye (co-opted)
Nondumiso Makwakwa (Mpumalanga)	Lorraine Osman (co-opted)

COVID-19 pandemic

Since the start of COVID-19, we have had to relook the way we do things. COVID-19 had a major impact on life as we know it. The pandemic came with its own restrictions as a lockdown was imposed; healthcare staff had to work around the clock to ensure service delivery and to ensure services continued, even amidst the infection. Pharmacy personnel were at the frontline and faced the risk of potential infection either to themselves or to that of a family member. We lost quite a few of our loved ones as well as colleagues. The pandemic affected our ability to operate as an Association since we struggled to achieve our desired outcomes, but we did as much as we possibly could with the limited access to services (key working groups worked from home and projects became difficult to monitor and follow up, as most places worked with skeleton staff or on a rotational basis).

Membership

Our membership has increased incrementally over the past few years. The table below indicates the total membership, i.e., the current number of paid members per branch as at November 2021.

Northern Gauteng (NG) – 243	Western Cape (WC) – 523
Southern Gauteng (SG) – 391	Limpopo – 174
Mpumalanga – 121	KwaZulu-Natal Coastal (KZNC) – 425
North West (NW) – 138	Eastern Cape (EC) – 291
KwaZulu-Natal Inland (KZNI) – 256	Northern Cape/Free State (NC/FS) – 139
Non-residents – 2	

There was an increase in the number of members in all the branches. One branch in particular almost doubled the amount of members. Well done to KwaZulu-Natal Inland for all the hard work they have done in recruiting new members, even in this difficult time.

SAAHIP activities

Conference 2022

One of the highlights in the SAAHIP calendar year is conference. SAAHIP National Executive Committee (NEC) has decided to have a virtual conference with a virtual Annual General Meeting (AGM). We had our very first virtual AGM (due to COVID-19) in March 2021. We had to learn to adapt and use technology. We conducted the AGM using MS Teams platform. We had some technical issues, but that was to be expected as this was our very first virtual AGM, including the potential problems that can arise when using technology. We are hopeful that we might have a physical conference in 2023. We would like to thank the Mpumalanga branch for all the hard work they have done during this difficult time to still arrange the virtual AGM and conference 2022. The SG branch will be organising conference 2023.

Focus areas

We have revised our focus areas to have reference to our strategic plan and the new requirements stemming from the nine pillars of the Presidential Health Compact, National Health Insurance Bill and the

new Developments for Pharmacy 2030. All at NEC have been assigned a focus area. Below is a summary of the focus areas:

1. Policies and legislation – NEC (and NG after consultation with branch committee)
2. Membership and Marketing – EC
3. Relationships with employers and policy makers – PRESCO and Union liaison committee
4. Conference – Mpumalanga
5. Communication – NW
6. Compliance with Health System Standards – Limpopo
7. EDL/STG review committee participation – WC
8. Human Resources for Health – President and Past President
9. National Health Insurance – Working document
10. Improved access to essential medicines – KZNI
11. Quality and Safety of Health Services – KZNC
12. Governance and Leadership – SG and FS/NC

We will relook the focus areas going forward as the COVID-19 pandemic delayed progress in many areas.

Pharmacy Month

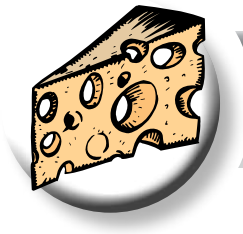
Due to the current pandemic, Pharmacy Month was postponed. This, however, didn't stop some of our branches and members from implementing health promotion in their facilities.

Social responsibility

One of our social responsibilities is Operation Smile. We will continue to support this initiative. Operation Smile is not the only drive that SAAHIP supports. Branches also support other charities, including outreach programmes, collecting canned foods and supporting old age homes.

Acknowledgement and conclusion

I would like to take this opportunity to extend my appreciation to all members of the NEC, for all their valuable contributions as well as all their sacrifices and hard work. I know this past year has been a difficult year, with the current pandemic making it difficult to fulfil our tasks and making our work harder, but I value all your expertise and willingness to dive right in where you are needed. To all our members, thank you for all your valiant efforts, I appreciate all that you do for the profession. Please stay safe and take care of yourself.



East, West, home's best…really???

Gary Black

Fish Hoek, December 2021

Since the onset of the COVID-19 epidemic, there has been a plethora of stories of the difficulties/advantages of working from home. Volumes of advice have been offered on how to make the transition from the routine of a structured, collegiate office environment to a successful, self-disciplined but often lonely circumstance of working from home. My musings here offer neither advice nor inspiration but merely reflect my personal (often amusing) experience.

I am acutely aware of the difficulties which some of my female colleagues, in particular, experienced during the darkest days of lockdown. At least one colleague found herself in the situation of having to work from home, while still seeing to the running of the household, but then also being required to supervise the homeschooling of two young children, and care for her elderly mother. All this while "hubby" went about his normal routine! By comparison, my own experience has been a walk in the park.

Some years ago, I converted our "wendy" house into a home office for myself at a fraction of the cost of adding a room in the roof. This little haven of writer's privacy is situated in the furthest corner of our property, far away from the hustle and bustle of the general household. In summer, it is sheltered and cooled by the shade of some old trees and in winter, it is easily warmed, dry and cosy. I can lose myself for hours here, in my own little world of thought, dreaming and writing at will. As long as Eskom behaves itself and the internet finds its way over the mountains down here to the Deep South of the Peninsula, I can research, work and communicate with committees and colleagues from far and wide. When we have an invasion of grandchildren, they have learned to pop in, give me a hug, and then leave their Grumpy-Grandpa to work while they play their noisy games on the other, far side of the property. Sounds idyllic? But wait, there is more to this than meets the eye!

Some 70 years ago, the folk who originally built our house had the foresight to plant plenty of trees which now provide a haven for a wide variety of bird species. Over the last thirty years, we have added more trees such as bottle-brush, yellow-wood, caprosma, wild olive and eugenia. Hedges of honeysuckle and indigenous plants such as protea, "wilde-dagga", buchu, aloe. etc. make our garden attractive to many birds. At any one time, you may see "witogies", rock-doves, "mossies", colourful sugarbirds, weavers or starlings. We have a pair of grey plovers on our large grass verge and a noisy clutch of nervous guineafowl. We have regular visits by an owl, and a yellow-billed kite will occasionally swoop down to raid the weavers' nests. Whilst it is a pleasure to host this feathered community, there are a few hooligans who get my blood boiling. These are the squawking crows who terrify all the little guys and the messy, raiding, starlings who will steal absolutely anything. Of course, worst of all, are the Hadeda ibis! At one stage, a pair nested in one of our old trees. Besides the irritating, nervous, noise they make, they empty their guts with a vile, smelly, white sludge that has almost nuclear properties in its ability to kill anything it lands on!

I had to resort to resuscitating my boyhood skills of using a *"kêtti"* to scare them off. But recently, this horrible hadeda re-visited my sanctuary with revenge! It happened like this…

It was a beautiful morning and I had been working away happily in my study without distraction. At 10.30 am I took a break, walked over to the kitchen in the house to make coffee and, of course, left my study door wide open. I came out to enjoy my coffee in the sun on the patio, only to be greeted by the sight of Mr Hadeda on the step at the door of my study! He had obviously taken advantage of my absence to raid my nearby vegetable patch and was now sneaking around looking for any snails or other titbits. Of course, I shouted at him, telling him in no uncertain terms to "go away"! Predictably, he panicked and rushed off in the opposite direction, through the open door, straight into my sanctuary! At this point I really lost it and went storming towards him, reminiscent of my days on the rugby field (some 50 years ago now!). In his state of fright, the first thing he did was deposit his innards on the carpet in the middle of my study! Liberally using a set of expletives which would make the most hardened sailor blush, I advanced on him with speed and agility I did not know I had left in this old body of mine, determined to wring his neck! Screeching and screaming blue murder, he flew up, narrowly missing my computer but successfully knocking a mug of water all over my printer and notes, before escaping through the open door! I was left to clean up the mess, vowing to get a new *"kêtti"* and take my revenge on the entire species at every opportunity!

Ja nee Boet, working from home down here in the Deep South appears to be quite idyllic, but it is not without its hazards/buzzards! This leaves us with just one question: "*Is working from home "for the birds"?"*

Ek vra maar net?

My reflection on pharmacy as a career in South Africa

Susan Buekes

On 8 December 2021, I tuned in to the South African Pharmacy Council's (SAPC) virtual Masterclass on the process of recording one's Continuing Professional Development (CPD) activities, as had been advertised on their Facebook page. As an aside, I am continually puzzled by the need of a regulatory body, and of professional associations, to make use of social media platforms, such as Facebook, to communicate with their members. After all, it is not an officially recognised medium, and not everyone who has an email address is partial to signing up for a presence on Facebook. The reluctance is surely greater since we learned from a whistleblower who went public recently, about the doings at Mark Zuckerberg's world-famous mega enterprise, and now known as Meta Platforms. The members of older generations are more prudent about sharing information on social media, and there are those who refuse to join Facebook.

I registered as a pharmacist in January 1962, and a few months later I joined the Pharmaceutical Society of South Africa (PSSA). I also became a member of the Royal Pharmaceutical Society (RPS) in 1965. I have remained a member of both ever since. When I switched my career path to hospital pharmacy in the 1970s, I became a member of the South African Association of Hospital and Institutional Pharmacists (SAAHIP), of which I am still an active member.

The history of SAAHIP is one of my keen interests, and one remarkable fact about SAAHIP is that its leaders have been passionate about providing continuing education to its members. Documentation dating back to the years since the organisation's inception can attest to this fact. Some examples include: pharmacology courses that were arranged in the 1950s, mini seminars on a Saturday were held in the 1980s, and speakers provided informative lectures as an item on the agendas of meetings over the years. Then, in 1987 SAAHIP started holding annual conferences at which members shared their innovations in the workplace, and these conferences became a platform for CPD. Thus, CPD has been part of SAAHIP's raison d'être since its beginnings.

When I retired from the KwaZulu Department of Health in 1998 I accepted an offer to work in retail pharmacy in the United Kingdom. Not content in retail, I joined a UK locum agency and started doing locums in hospitals. In September 2010, the General Pharmaceutical Council (GPhC) came into being and took over the regulatory side of the RPS. That was when the recording of CPD first came to my attention, and I started receiving all the information regarding the system. It was made easier because the Pharmaceutical Journal, the official journal of the RPS, published CPD articles every week, with guidance on how to record CPDs.

Soon thereafter, the SAPC started murmuring about making the recording of CPD compulsory. As it turned out, they had acquired the same programme that the GPhC was using for recording CPD. So, it was easy for me to duplicate what I had recorded on the UK system, onto the SAPC system. I have recently checked the archives of my CPD on the SAPC website and my recorded CPDs starting in 2012 and over subsequent years, are still to be found there.

The SAPC's programme was made available to pharmacists in 2012 but it was not until 2018 that the SAPC published its proposed legislation for making CPD compulsory. The proposed legislation was published for comment and, as it turned out, once again, pharmacists displayed their apathetic attitude towards their profession, by ignoring an opportunity to have their say on an event that would have a profound effect on their practice as a pharmacist.

Having had first-hand experience with the proposed system, I seized the opportunity to have my say. As it turned out, I later learnt that only one pharmacist took the trouble to submit comment to the Council. I have no idea what the PSSA, SAAHIP, and the other sectors, had to say on behalf of their members. What troubled me the most was that the GPhC in the UK no longer used the very system that the SAPC was now proposing as a compulsory CPD system for South Africa's registered pharmacists. I wrote in my submission:

Now that the SAPC has finally drafted regulations for making the online recording of CPD mandatory, it is notable that the General Pharmaceutical Council has recently changed its approach to CPD by changing to a system referred to as Revalidation. https://www.pharmacyregulation.org/revalidation (https://www.pharmacyregulation.org/sites/default/files/document/gphc_revalidation_framework_january_2018.pdf)

One good thing, though, the SAPC decided upon having six recorded CPDs per annum, instead of the original twelve.

To complicate matters, the system included domains and competencies, and there now exists a forty-six-page Guidance Document for CPD, published as Board Notice 82 of 2020. I printed the document after the Masterclass because I realised that the version I had in my possession was outdated, having been approved by the SAPC on 17 February 2016. The latest document

now included Behavioural Statements for each competency, a subtlety that I had been oblivious to all these years.

Unless I misunderstand the process, have newly qualified pharmacists not been exposed to the recording of activities during their internship year for the past number of years? Surely they do not need instruction. It's the backbone members of the pharmacy profession who now have to cope with online study and recording, and for some, this is foreign territory.

As I sat through the Masterclass presentation in which a step-by-step explanation was being given to an unknown number of registered pharmacists, whose livelihood depended on recording six CPD activities for this past year, 2021, a niggly feeling of resentment started creeping up on me. I had already recorded the required number of CPDs for 2021. I had done the same during the previous year, presumably to the satisfaction of the assessors, as I was in possession of a letter from the Council thanking me for my efforts, but I was also aware that the Council had extended the deadline by several months for 2020 submissions. Now here we were receiving instructions as though we were at primary school. Something was wrong with the picture.

Why were pharmacists being singled out for such stringent requirements for practicing their profession?

In my comments submitted to the SAPC regarding the proposed compulsory CPD regulations, I had pointed out the following:

"I have checked to determine what is required by other professions and the overview provided on the Health Professions Council of South Africa (HPCSA) website reads as follows:

"Healthcare practitioners have a responsibility to continually update their professional knowledge and skills for the end benefit of the patient or client.

"To this end the HPCSA has implemented a Continuing Professional Development programme. Every practitioner is required to accumulate 30 Continuing Education Units (CEUs) per twelve-month period and five of the units must be on ethics, human rights and medical law. Each CEU will be valid for 24 months from the date on which the activity took place (or ended, in the event of post-graduate studies) after which it would lapse. This means that practitioners should aim to accumulate a balance of 60 CEUs by the end of their second year of practise, and thereafter top-up the balance through additional CPD as each 24–month validity period expires.

"Mandatory random audits are conducted to ensure compliancy. Once a practitioner's name has been selected, they are required to submit a CPD portfolio to Council within 21 days. Non-compliant practitioners will be given six months in order to comply. After the period of 6 months, a practitioner will again be audited and if there is still non-compliance, the Professional Board will consider appropriate action. Practitioners are only required to submit their CPD portfolios when their names are drawn from a random sample audit and when requested to submit their completed form CPD 1 IAR with accompanying proof of CPD activities undertaken.

"This appears to be a more reasonable requirement. The activities are fewer in number, and some can be rolled over into the following year."

The HPCSA, together with the 12 Professional Boards under its ambit, is established to provide for control over the education, training and registration of practicing of health professions registered under the Health Professions Act. This is also the same reason for the existence of the SAPC. This, then, begs the question, what is so special about the pharmacy profession, that their CPD needs have to be so micromanaged?

This also leads to further reflection. When I embarked on my pharmacy career, the South African Pharmacy Board (SAPB) controlled the profession. Back then the Pharmacy Board was half the size of the present SAPC, and the majority of members were pharmacists elected by registered pharmacists. Compare this to the present government-controlled SAPC, despite their claim on their website that the ***SAPC is an independent statutory council which receives no grants or subsidies from government or any other source, but is wholly funded by the registered members of the profession.*** The composition of the body appears on the same page and reads as follows: ***The South African Pharmacy Council (SAPC) is constituted of a 25-member strong collective of experienced pharmacy professionals, educators and professionals from other key professions.***

Nine (9) members of Council are nominated by the profession, another nine are recommended by Members of Executive Committee (MECs) responsible for health in South Africa's nine provinces. Two members of Council are appointed by the Minister of Health following recommendations by universities that are accredited to offer pharmacy education. The Minister also appoints a representative of the Department of Health as well as four members from other sectors of the South African population.

But back to the 1950s... The exams for every subject were set by external examiners appointed by the SAPB. The courses were undertaken at pharmacy schools within Technical Colleges. In the 1950s, there was a pharmacy school in Cape Town, Durban, Port Elizabeth, and Johannesburg. As a result, every student doing pharmacy had to be au fait with the syllabus of every subject when writing the board exams. Pharmacy was renowned for being a difficult course because of the system of board exams. It was not unheard of that some students wrote an exam three or four times, before passing. Also, at that time, students did their "apprenticeships" before writing their finals. I did my first year, then did a two-year apprenticeship, before doing my last two years of study. There was no need for a pre-registration examination then, because all pharmacists wrote and passed the same board examinations and the successful students had all proved themselves capable pharmacists and were thus all of the same standard.

Since the 1960s, pharmacy courses have been introduced by the universities and pharmacists now register with a four-year BSc

degree and a one-year internship. But to ensure that registrants conform to the same standards, a pre-registration examination is now necessary. In addition, the government introduced a compulsory one-year community service a couple of decades ago, so that remote hospital pharmacies would be assured of at least one pharmacist on their staff.

Could it be that the SAPC is concerned that the pharmacists that are being turned out by the universities, and are doing internships and community service, within government hospitals, are not competent at keeping up to date with developments in their chosen profession of pharmacy? Why is it necessary for professionals to be spoon fed with CPD throughout their careers? Why do they have to record what they have learnt and provide proof thereof?

What is it costing the SAPC to assess the thousands of CPD submissions submitted annually? What is it costing to go through each pharmacist's submissions, checking if they are two step or four step, whether they fit into the correct domain, the correct competencies, and fit the correct behavioural statements?

I had decided to become a pharmacist because I considered it a suitable career for a woman. I have been a dedicated pharmacist to this present day. For me, it has not been a job, it has been a profession. I did not stop being a pharmacist when I went on pension from my full-time job. I belong to my professional organisations. I have worked in various fields of pharmacy, and in each field, whether it be retail, hospital, wholesale, quality control, quality assurance, no matter in which country, I made sure that I was capable of performing the work expected of me. I still consider myself a pharmacist, even though I have not been in paid employment for a number of years. I read pharmaceutical journals, I participate in webinars, and I am active in my professional organisations.

To me, it is insulting that the SAPC has seen fit to designate pharmacists as being either active or not active, or practising or non-practising. One is either a pharmacist or one is not. If one is a pharmacist, one must behave professionally. Does a university even include in its courses what it is to be a professional? If the SAPC is concerned about the quality of graduates that are being turned out by the universities, it should be devoting more time to ensuring that the universities are turning out well equipped, intelligent, professional pharmacists, who understand the importance of remaining abreast of developments in their field of expertise. Then perhaps the Council can be assured of a quality service being provided by registered pharmacists.

What distinguishes pharmacists from other health professionals? If the HPCSA is satisfied that its members may submit only an accumulation of points to remain registered, why does the SAPC require its pharmacists to record in detail what activities they have undertaken and to categorise the activities into domains and competencies, and then write lengthy descriptions of what has been learnt and why? Do I need to worry about the competency of the next doctor I consult, or the surgeon who may perform emergency surgery on one of my loved ones? What about the dentist who has to repair my teeth and those of my family?

After spending sixty plus years of my life as a pharmacist, I have no intention of bowing out gracefully from the profession, as quite a few colleagues have done. They simply cannot be bothered to figure out the complexities of the SAPC website and recording what they have learnt whether it be articles in journals or other avenues available to them. Reliable, knowledgeable pharmacists, who, though retired from fulltime practice, provide a valuable locum service, are being lost to the profession.

It is my intention to remain on the SAPC register as an active, practising pharmacist, although I do not intend to work for remuneration. But I want to describe myself as a pharmacist. I will behave professionally, and I will continue keeping myself informed about developments in the world of pharmacy. I still wish to continue having opinions on what takes place within the field of pharmacy, and hopefully inspire younger pharmacists to do the same. I end this piece with a quotation that has stuck in my mind for fifty years:

"If all pharmacists were laid end to end, would they even care?"

Disclaimer: *The views of the author of this opinion piece are her own, and are not necessarily the views of the PSSA, its members and/or its staff, who do not take responsibility for any possible inaccuracy/misunderstanding.*

Obituary

David George Boyce

3 December 1946 – 15 December 2021

David Boyce will be remembered as a man of great integrity, honour and humility.

He studied pharmacy in Cape Town, during which time he was involved in student organisations at local, national and international levels. Having been the president of the South African Pharmaceutical Students Federation (SAPSF), and Chairman of Publications of the International Pharmaceutical Students Federation, he never lost his interest in pharmacy students and played a significant role in the establishment of the Chair of Pharmacy at the University of the Witwatersrand.

Following his registration as a pharmacist, he spent time working in hospital, wholesale and community pharmacy practice, including owning and managing his own community pharmacy for ten years. David was ahead of his time in many ways – he firmly believed that the role of the pharmacist was both educational and clinical, with the patient as the focus. This influenced his continuing education initiatives in the PSSA. He fully supported a patient-centric approach to pharmacy practice in order for pharmacists to add benefit to their communities.

Having a continuously curious mind, he carried on studying, achieving a B.Com. with majors in Economics, Business Management and Computerised Information Systems. This served him well in his future career, and also benefited the PSSA immeasurably.

The Southern Transvaal branch of the PSSA (later to become the Southern Gauteng branch) recognised his knowledge and talents. At various stages, David was Chairman of the Branch, the Business Committee and Pharmaceutical Management Services. He was appointed to manage the financial and operational turnaround of its business entity, TPS.

At that stage, there were a number of prescription checking offices in large PSSA branches. This eventually led to the creation of MediKredit, which changed and modernised prescription claims to medical schemes.

Most of his working life was focused on pharmaceutical benefit management, health economics, pharmacoeconomics, computerised information systems and managed health care.

His pioneer work in medical informatics included the introduction of the first computerised community pharmacy dispensary management system. The NAPPI code system, which is still the standard for the coding of medicines, hospital consumables and surgical appliances, was developed by him. David's introduction of the first online, real-time Claims Transaction Processing Facility in the South African medical scheme industry changed the way claims were submitted.

Since 2003, David evaluated the impact of the regulated dispensing fee on community pharmacy and was regularly consulted by the PSSA. He was responsible for unprecedented economic research in this arena. He also served on SA Pharmacy Council committees investigating managed health care, tariff and franchising.

The effect of David Boyce's knowledge and actions in the pharmacy world did not go unnoticed – he received many awards and accolades. He was a fellow and honorary life member of the PSSA, and was also an honorary life member of the SAPSF. He was the first recipient of the JB Israelsohn Award, given by the Southern Transvaal Branch of the South African Association of Retail Pharmacists for services to community pharmacy, and the Alf Radis Award from the Cape Western Province Branch of the PSSA in recognition of the achievement of the establishment of the TPS Drug Information Centre. More recently, David received the William Paterson Memorial Award.

The PSSA's sincere condolences go to his wife Linda, his sons and his daughter.

Trevor Collett

16 January 1935 – 12 January 2022

Trevor's father owned a pharmacy in Cathcart, and Trevor was a popular figure at Collett's Pharmacy in Stutterheim, where he served the rural community and the many farmers in the area. They were pharmacists of stature.

After some years, he sold his pharmacy to Taki Kyriacos and retired to nearby seaside village, Kenton. However, he was soon occupied doing locums and was then appointed a SA Pharmacy Council inspector.

I wonder how many pharmacists remember the days of the 1970s and 1980s when community pharmacy was prospering and pharmacy conferences were joyous occasions. Highlights of the conferences were the vigorous debate and the debating prowess of a number of pharmacists.

Also well-arranged activities for the partners (mostly ladies in those days) and most entertaining evening events. Great participants in the evening events were the representatives of the Border Branch namely John Forbes of East London, Ray Palframan of King Williamstown and Trevor Collett. They certainly added to the fun of the evening and even arranged a Pharmacy Conference in East London using the Kings and the Kennaway Hotels.

Sadly, those days are no more, and Trevor passed away on 12 January 2022.

He will always be remembered for his love of his family, joy of living, his quick wit and easy laughter and, of course, his great singing ability.

Sanofi partnership strengthens mental health service delivery in South Africa

Sanofi South Africa has partnered with the National Department of Health, the Foundation for Professional Development and the World Association of Social Psychiatry to upskill health workers to diagnose and manage mental health disorders at primary and secondary levels of care.

This is in response to South Africa's rising burden of mental health disorders, with approximately 1 out of 3 South Africans suffering from a mental illness during their lifetime,[1] but only an estimated 25% of those with mental disorders receiving treatment.[2] This is mainly due to a shortage of health workers specialising in mental health, over-burdened specialist tertiary facilities, a high rate of readmission, and slow integration of mental health into primary health services.[3]

As highlighted in the Human Rights Commission Report on the state of mental health care in South Africa following the Life Esidimeni tragedy: "*although the Mental Health Policy Framework and Strategic Plan (2013–2020) emphasizes the value of a primary healthcare approach in reducing the treatment gap, the provision of mental health services seems to focus on care in psychiatric hospitals*."[4] Many barriers to providing mental health services were pointed out in this report. The lack of knowledgeable and skilled human resources to provide efficient and empathetic stigma-free services, especially in under-resourced rural areas, was highlighted.

The Sanofi South Africa partnership resulted in the South African National Mental Health Education Programme, and positive results from the first phase have just been published in the *African Journal of Primary Health Care & Family Medicine*.[3]

In this phase, 1 120 healthcare professionals (Medical Officers and Professional Nurses) were trained across all nine provinces within public health facilities, correctional services and university PHC clinics. The original one-year programme used a blended mental health care training approach, combining a 3-day face-to-face workshop with 4 months of e-learning.[3]

Results showed significant increases in their confidence in dealing with mental health issues:[3]

- Overall average confidence rating for performing mental health care activities increased from 5.8 before the course to 8.2 immediately after it, and was still 8.2 when followed up 3 months later ($p < 0.001$).
- Overall average confidence rating for managing mental health conditions increased from 5.8 before the course to 7.6 immediately after it, rising further to 7.9 when followed up 3 months later ($p < 0.001$).

Says Dr Beki Magazi, Medical Head: Sanofi General Medicines, South Africa: "Furthermore, at the 3-month follow-up after the training, participants reported approximately an overall 48% **decrease** in the mental health patients they had to refer to higher levels of care. This means they were able to assist these patients effectively themselves."

A second phase of this programme, with the aim of upskilling another 500 healthcare professionals across the country, was recently concluded.

Says Dr Magazi: "Ensuring that South Africans with mental disorders receive adequate care and treatment is essential – and becomes even more vital given the additional burden of HIV and AIDS in the country. Persons living with HIV/AIDS are at higher risk of some mental health conditions. For example, people living with HIV are twice as likely to have depression as people who do not have HIV.[5]

"The results of the first phase of the South African National Mental Health Education Programme are greatly heartening, and indicate that we will be able to make a significant impact in improving the numbers of South Africans with mental disorders who receive appropriate treatment at the level of care nearest to them."

To find out more about the South African National Mental Health Education Programme watch the BBC StoryWorks video here: https://ncdalliance.org/turning-the-tide/films/meeting-minds.

To find out more about Sanofi's commitment to people with mental disorders in low and middle income countries, watch the video here: Mental Health & Epilepsy: Tackling The Challenge of Access to Care.

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