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- SA Association of Hospital and Institutional Pharmacists
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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.

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Disruptions in healthcare – *Esprit de corpse* – Pharmacists unite towards patients' safety!

Natalie Schellack

Over the last three years, there have been many changes – the SARS-CoV-2 virus, the war in Ukraine at a global level – and, closer to home, the recent labour strikes by NEHAWU. These challenges impacted healthcare and inadvertently social healthcare. The pharmacy profession is arguably one of the most accessible healthcare providers to the public, and had to be resilient in the face of these challenges; providing access to medicines to ensure continuity of services in the interest of the patient's welfare. Resilience included changing practices from ensuring emergency pharmaceutical care to participating in vaccination outreaches during the pandemic. At the heart of it, all the pharmacists focussed on was the ethos of the profession – patient-centred. Each and every aspect involves the wellbeing of the patient.

This brings us to the ethical question of participating in labour strikes as a profession and the potential impact that would have on the wellbeing of the patient. Later in this edition, Mr J Hattingh describes the difference between a trade union and a professional society. Further to this, he explains that there is no trade union representing the pharmacy profession in South Africa. We will explore the implications of this in the ensuing editorial.

To this end, it is concerning that a Labour Appeal Court had to provide an interdict to stop the intimidation tactics of the National Education, Health and Allied Workers Union (NEHAWU) in governmental hospitals across South Africa. This is playing out in South Africa, which has one of the most progressive constitutions in the world—*The Constitution of the Republic of South Africa, 1996,* which was approved by the Constitutional Court (CC) on 4 December 1996 and took effect on 4 February 1997. The Constitution states very clearly that (per verbatim):

1. Everyone has the right to have access to
   a. healthcare services, including reproductive healthcare;
   b. sufficient food and water; and
   c. social security, including, if they are unable to support themselves and their dependants, appropriate social assistance.
2. *The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights.*
3. *No one may be refused emergency medical treatment.*

This is not the first time globally or in South Africa that healthcare workers take to the streets, leaving the most vulnerable unattended to. Thus, denying their fundamental constitutional rights. This in an already overburdened healthcare system, further eroding the public trust in our healthcare workers.

The pharmacy profession, which amongst many other duties, ensures access to medicines and healthcare, has a more important role to play than ever before. The right to withdraw services is subject to the overarching question of how essential that profession is to the wellbeing of society, and that should overrule their right to strike. The pharmacy profession is essential in every way possible for the provisioning of safe and reliable healthcare for the citizens of South Africa (and globally).

Patient safety has been the focus of a recently held conference (23 and 24 February 2023) in Montreux, Switzerland, namely "The Fifth Global Ministerial Summit on Patient Safety". Ministerial delegations from 80 countries (South Africa was not represented by a ministerial delegation) around the world came together to pledge their support to ensuring patient safety, reaffirming that patient harm in healthcare is an urgent public health issue. The Charter may be accessed here: https://apps.who.int/iris/rest/bitstreams/1360307/retrieve.

This sentiment was highlighted by Dr Tedros Adhanom Ghebreyesus, WHO Director-General. On the second day, in his address to the ministerial segment, Dr Tedros urged health ministers:

"To invest in patient safety as part of their commitment to universal health coverage and health security; to build a culture of safety and strengthen reporting and learning systems; to support health workforce and strengthen their capacity; to strengthen data systems; and to engage patients and families in their own care." Dr Tedros announced that the theme for World Patient Safety Day 2023 would be ***"Engaging patients for patient safety"***.

Ensuring patient safety is not a new role or responsibility for pharmacists. Historically, pharmacists have done this as part of their scope of practice in various healthcare sectors. For centuries, the community pharmacist (often the first health contact for patients) councils and communicates with the patients. Further to this, they provide medication information and pharmacist-

initiated therapy, whilst their hospital counterparts actively participate in medication reconciliation, preventing and reporting adverse medicine events, preventing drug-drug interactions, and promoting antimicrobial stewardship, to mention only a few.

It remains vitally important for the pharmacist to continue to evolve to ensure patient safety as outlined in the Montreux Patient Safety Charter. Seven strategic objectives have been set out to eliminate avoidable patient harm, and the most important role for the pharmacist is to remain the custodian of medicine, through accepting a challenge. The challenge is to lead global medication safety, through medication stewardship and providing medication without harm in many different ways in their everyday practice.

The South African Pharmaceutical Journal and the South African Pharmacist's Assistant Journal remain committed to ensuring a constant flow of information and knowledge to mitigate the risk of avoidable medication harm and improve the quality of patient care.

On a different note, I salute all women in healthcare as we celebrated International Women's Day on 8 March. The day was brought into existence in 1975 to highlight issues that affect women and raise awareness for those issues. One of the women that I want to draw attention to is Ms Lorraine Osman, who has been a mentor, friend, and fierce leader, not only to me but to the pharmacy profession in general. Lorraine, thank you for 25 years of commitment to the profession, passionately illustrated in your editorials that were aptly titled "Piece of my mind". We salute and honour you and wish you an incredible journey ahead.

With that, I will leave you with a quote from Marie Daly (The first African American woman to earn a PhD in Chemistry):

"Courage is like — it's a habitus, a habit, a virtue: you get it by courageous acts. It's like you learn to swim by swimming. You learn courage by couraging."

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President's Message

Should the PSSA engage in trade union activities?

Joggie Hattingh
PSSA President

Every now and again presidents of sectors and of the Pharmaceutical Society of South Africa (PSSA) are challenged to stand up for our members rights in the workplace or we get called upon to start a trade union for pharmacists and pharmacist's assistants (PAs), alternatively a group of very enthusiastic young professionals will announce on social media that they are starting a trade union for pharmacy staff!

Firstly, it is very important to distinguish between a trade union and a professional society.

The Labour Relations Act, 1995 defines a trade union as *"an association of employees, whose principal purpose is to regulate relations between employers and employees, including employer organisations."*

A trade union will represent members on bargaining councils and during disciplinary hearings. They will negotiate salary levels, conditions of service and rights of workers. Unfortunately, there is no trade union representing pharmacists and PAs specifically in South Africa. This is not for lack of trying, but due to legislative restrictions and our members' personal preferences. We make up such a small portion of the workforce that our voices are drowned out in the crowd of trade union members (PSA, NEHAWU, etc.).

Many years ago, unions were allowed to have "branches" for professional groupings, but with changes to the law this fell away and will never return. Also, to be a **representative** trade union, you must have a sufficient following in the sector. In our case the Healthcare Sector, not only within the pharmacist and pharmacy support segment of the sector. If all the pharmacy staff on the South African Pharmacy Council (SAPC) register worked for Government, we would still not have sufficient numbers to become a representative trade union. Even more unattainable is to be a **majority** trade union where 50% plus 1 of employees are required as members (see the Trade Unions (Recognition) Act 53/1998). One can start a trade union without registering, but you have no access to bargaining counsels and in fact, no influence at all.

Some years ago, we tried within the Hospital Sector to convince our members to all join a single trade union to give us at least a platform where we could be heard, but it just resulted in fighting due to personal loyalties to specific trade unions. It would have been easier to try and convince all members to vote for a single political party! Over the years there have been numerous attempts to establish a new trade union for pharmacists and PAs, but all failed due to the lack of numbers and loyalty/historic attachments to existing trade unions.

Secondly, why is a professional society like PSSA formed and what does it do?

The mission of a (any) professional society is primarily advocacy, education and information. Their influence flows from their continuing and highly visible functions: to publish journals, to develop professional excellence, to raise public awareness, to make submissions on behalf of the profession regarding policy, legislative and practice issues and to make awards. It is an association or society of professional persons, that represents their professional requirements. As the PSSA, we do not get involved in the "business side" of pharmacy, only on professional matters. For instance, we do not get involved in salary negotiations, as we live in a free market. If a salary offered is too low, then nobody should take the job! If a person's expectations are too high, they will not accept the offer that is made to them.

Obviously, as a professional society, we do not condone exploitation and will always denounce such actions. We will also act against members who make themselves guilty of such actions. This said, we are not the enforcer of law. Such complaints should be directed to the Department of Labour and if adverse findings are made, the SAPC will act against the perpetrator. We will also act against members found guilty of unprofessional conduct.

As the PSSA, we do not engage in representing our members in disciplinary hearings. We give sound advice and will support with legal counsel. It would be very detrimental to the professional image of our organisation to represent (and defend the actions of) members who are accused of unprofessional conduct. This would mean that we condone such conduct.

What do we as the PSSA then stand for and what do we offer members?

The PSSA promotes ethical and professional practice by all pharmacists and pharmacy support staff at all times. We support this by giving

our members access to continuing professional development (CPD) education, events and webinars, expert advice and support on practice and legal issues, professional legal service including human resource related queries, quarterly South African Pharmacist's Assistant journal (4 issues), bi-monthly South African Pharmaceutical Journal (6 issues), regular, informative and reliable electronic newsletters and cost effective and comprehensive insurance including professional indemnity, to name a few.

To promote our profession, the PSSA negotiates on behalf of the profession, we do national promotion of our profession to other health professionals and the public (think of Pharmacy Month!), we involve ourselves with interaction and benchmarking with colleagues from the same or different sector and branch and internationally. We also continually review and address healthcare legislation to ensure our members and our profession is adequately protected and empowered.

The PSSA's professional team supports our members in all of the above matters and currently the PSSA has a permanent staff member addressing membership of PAs in particular.

The PSSA thus fulfils a different role than that of the trade unions and it is important not to conflate the roles and responsibilities of two vastly different entities.

An update on cholera – pharmacist be vigilant!

Natalie Schellack

Vibrio cholerae, native to the aquatic environment and the causative agent of cholera, has undergone continuous evolution in different parts of the world. The World Health Organization (WHO) describes cholera as an acute intestinal infection caused by consumption of food or water contaminated with the bacterium *Vibrio cholerae*. Untreated, cholera can kill within hours, and people living in places with poor sanitation and unsafe drinking water are most at risk.

More close to home – the current cholera epidemics are occurring in a context of extreme climatic events, such as severe drought in the greater Horn of Africa, and seasonal rains and tropical storms in southern Africa, which exacerbate the risk of propagation of waterborne diseases. Combine this with gaps in water and sanitation infrastructures and services, poor hygiene, shortcomings in surveillance, a lack of healthcare systems and workforce to facilitate early detection for a prompt outbreak response, as well as insufficient political commitment to secure the necessary resources to impact changes. Therefore the WHO has warned that Africa is seeing an exponential rise in cholera and diarrhoea cases amid a global surge. In 2023 this year alone, the continent has recorded cholera cases in Burundi, Cameroon, Democratic Republic of the Congo, Ethiopia, Kenya, Malawi, Mozambique, Nigeria, Somalia, South Africa, and Zambia, while Zimbabwe has recorded two confirmed cases and more than 6 000 cases of diarrhoea. The first three cases were imported or import-related cases following travel to Malawi. Cases 4 and 5 acquired infection locally; they had not travelled, had no links to imported cases or to each other, and don't reside or work in the same area. These two are classified as indigenous cases. The sixth case is newly reported and under investigation.

In South Africa, as of 28 February 2023, a total of six confirmed cholera cases including one death have been reported in Gauteng Province. All cases are adults, ranging in age from 19 to 44 years. No confirmed cases have been reported in other provinces. Isolates from all cases are identified as toxigenic *Vibrio cholerae* O1 serotype Ogawa, and are susceptible to ciprofloxacin.

We are urging pharmacists and other healthcare workers and laboratorians countrywide to consider and test for cholera in persons with acute watery diarrhoea and other signs and symptoms. Some of the signs and symptoms include:

- large amounts of diarrhoea (which sometimes looks like rice water) – can cause dehydration (thirst, weakness or fatigue – sunken eyes and decreased skin elasticity)
- vomiting (which sometimes looks like rice water)
- leg cramps
- feeling weak

Most vulnerable populations include infants, young children, geriatrics and immunocompromised patients who are already sick are most at risk of getting severely ill if they get cholera. Symptoms usually start between 12 hours and 5 days after being exposed. Of people with symptoms, usually 20–30% develop severe disease.

The first intervention that the pharmacist can be involved with could include introducing a simple oral rehydration solution. This can be made at home by mixing 1 litre safe water, 6 teaspoons of sugar and half a teaspoon of salt. Then referring the patient to a health care facility. A killed cholera bacteria vaccine is available in South Africa for use in highly selected cases. It provides some protection for a limited period against cholera and perhaps even against the much more common 'traveller's diarrhoea'. The use of the vaccine may be considered by persons who may be regularly exposed to contaminated water in the course of their work or participating in water sports. South Africa has entered into a deal with another country for a manufacturing company to start the production of cholera vaccines locally within South Africa.

Local experts accepted in FIP Policy Statement committees

Every year at the FIP Council meeting, the Council agrees to a list of FIP policy statements that will be prepared for adoption at the upcoming FIP Council meeting during the coming year. These policy statements can either be revisions of older existing policies, or the development of new policies.

The policy statements reflect the FIP's stance on a variety of professional, ethical, social and other issues that are important for human health and are relevant to pharmacists worldwide. Member organisations may then use a statement for advocacy purposes or to advance the profession, backed by the recommendations agreed to by over 150 pharmacists' organisations at global level.

An FIP policy statement is usually 3–6 pages long and provides recommendations to different stakeholders. As part of your role as a member of the policy committee, you will be invited to provide input based on your expertise, your experience in a given practice setting, and your knowledge of the needs and priorities related to this topic in your country and region.

At the FIP Council meeting in Seville, Spain, in September 2022, it was agreed to develop and/or revise statements in 2023 or 2024 on the topics of antimicrobial resistance (AMR), medicines information, disaster management, life-course vaccination, environmentally sustainable pharmacy practice and the role of pharmacist in promoting a tobacco-free future.

FIP Member Organisations as well as members from the FIP Bureau, Board of Pharmacy Practice (BPP), Board of Pharmaceutical Sciences (BPS), FIP Educational Initiative (FIPEd) and Regional Forums are invited to submit nominations of experts in the respective fields to serve on these global policy statement committees. Such nominee should be fluent in English (as all the work will be conducted in English), knowledgeable in the field and available.

The PSSA, a proud member organisation of FIP, adheres to this call for nominations annually by proposing colleagues with experience and insight into their respective fields. The consultations are done via teleconferences (usually 1–2 times per month for max 2 hours) and email correspondence between February and July 2023, and a final draft should be ready for review by the FIP Bureau by the end of April. Prior to the meetings, committee members will be asked to review the statement, add their point of view and/or review/resolve comments.

Earlier this year, the PSSA nominated six South African pharmacists to each of these policy committees and recently received the great news that, despite FIP receiving an overwhelming response to the call for nominations and being tasked with the difficult job of selecting the most suitable candidates for each committee taking into consideration expertise, regional representation and a manageable size of the committees, all nominations from the PSSA were successful.

The following pharmacists will represent South Africa on the respective FIP Policy Committees:

- Revision FIP Statement of Policy on Control of Antimicrobial Resistance (AMR), adopted in 2017 – **Prof. Sabiha Essacks**, University of KwaZulu-Natal
- Revision FIP Statement of Policy on Strategic development of medicines information for the benefit of patients and users of medicines, adopted in 2017 – **Ms Mandy Ariefdien**, University of Cape Town Medicines Information Centre
- Revision FIP Statement of Policy on the Role of the pharmacist in disaster management, adopted in 2017 – **Dr Mariet Eksteen**, Pharmaceutical Society of South Africa
- New FIP Statement of Policy on the role of pharmacists in life-course vaccination – **Prof. Hannelie Meyer**, Sefako Makgatho Health Sciences University
- Revision FIP Statement of Policy on Environmentally sustainable pharmacy practice: Green Pharmacy, adopted in 2016 in Buenos Aires – **Prof. Renier Coetzee**, University of the Western Cape
- [2024] Revision FIP Statement of Policy on the Role of the pharmacist in promoting a tobacco-free future, adopted in 2003 – **Ms Jackie Maimin**, Independent Community Pharmacy Association *(This policy statement will serve for adoption at the FIP Council meeting in Cape Town during September 2024)*

Congratulations to the successful candidates. Thank you for your time and energy to represent the country on this international platform. The PSSA looks forward to reading the final policy statements.

The PSSA/Alpha Pharm distance learning programme 2023

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, 2023 – Common antibiotics and their uses

Antibiotics are among the most prescribed medicines. Most antibiotics for systemic use in humans are prescribed by general practitioners in the outpatient setting, with acute respiratory tract infections being the most common indication, followed by urinary tract infections.

The use of antibiotics, appropriate or otherwise, is an important factor leading to the development of antibiotic resistance. Furthermore, the inappropriate use of antibiotics for upper respiratory tract infections, most of which are viral, significantly contributes to antibiotic resistance.

Superbugs are bacteria resistant to one or more antibiotics, making it difficult to treat or cure infections that were once easily treated. The spread of superbugs is a serious and growing threat around the world. A tipping point has been reached globally, where we find ourselves on the brink of a 'post-antibiotic era'.

This module discusses commonly used antibiotics and provides guidance on their appropriate use for commonly occurring community-acquired bacterial infections. It will enable you to provide information to the public and prescribers on judicious antibiotic use which can help prevent unnecessary antibiotic use.

Improving the way healthcare professionals prescribe antibiotics and the way that patients take antibiotics can help fight antibiotic resistance and ensure that these life-saving medicines will be available for future generations.

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 2023 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, 2023 – Probiotics, prebiotics, and antibiotics

We know that many people use probiotics and prebiotics and that they are prescribed at times by doctors, but what do we know about these products? What do they do? How do they work and when should they be used? This module helps answer these important questions.

The human gastrointestinal tract or 'gut' contains a complex ecosystem of bacteria and other micro-organisms, most of which are non-pathogenic (i.e. do not cause disease) and help to protect against disease and maintain health.

It has long been known that the micro-organisms in the human gut play an important role in digestive health. However, more recent research indicates that our gut bacteria may relate to wider aspects of health, including immunity and disease prevention.

This module discusses gut health and the role of gut bacteria, probiotics, and prebiotics. The module also looks at antibiotics and the adverse effects of antibiotics on our gut bacteria.

The front shop staff in the pharmacy are well-placed to engage pharmacy customers on the role of the gut flora in maintaining health and the use of probiotic and prebiotic products.

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.

"Mentorship in the Pharmacy Profession" – an update

The PSSA conference that took place in September of 2022 had a session titled "*Mentorship in the Pharmacy Profession*," that highlighted the importance of passing acquired knowledge to the young pharmacists in the profession. We believe that this and many other efforts that went into the call for both mentees and mentors has led to the beginning of yet another mentorship programme cycle.

We are happy to announce that on 7 February 2023 the PSSA YPG officially launched its mentorship programme with 10 mentorship pairs who are all eager to embark on a year-long journey of professional development. We would like to thank all those that were in attendance, with a special thanks to our guest speakers, Dr Mariet J Eksteen, who gave a brief history of the mentorship programme and how it fits into the PSSA's objectives, Steven Levy the leadership coach who will be providing invaluable tools and skills to our mentorship pairs, and lastly, Joggie Hattingh who gave a warm word of welcome and well wishes of success to the mentorship pairs (illustrated in Figure 1).

The next few months of the journey will include an exciting series of coaching sessions and plenty of time for the mentorship pairs to discuss their goals and strategies to achieving these. We will be sure to provide more details on the progress of the programme.

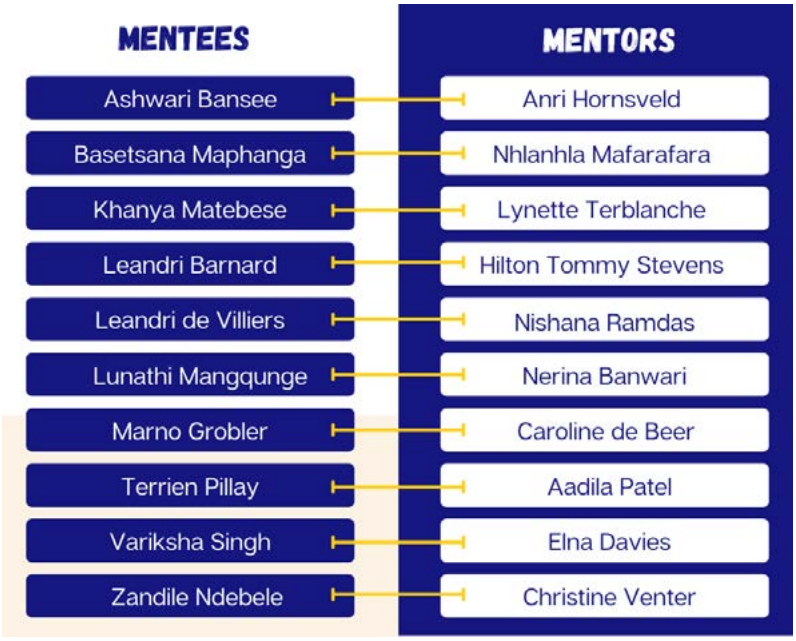
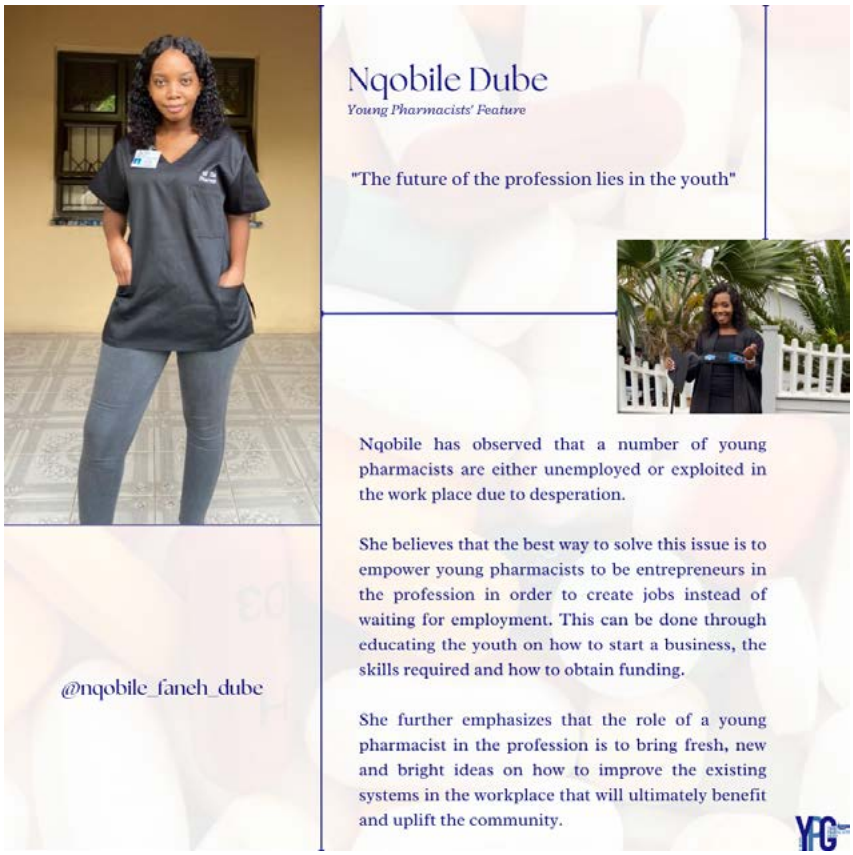


Figure 1: Mentor-mentee pairs

What is happening on social media?

The YPG's social media pages are exciting platforms with over 500 young pharmacists who are showing interest in contributing to the growth of and becoming active participants of the profession. Each week the YPG will feature a new young pharmacist who will share their knowledge and/or insight into matters of the profession with the aim of bringing the voices of the youth to the profession. We look forward to having more young voices on our platforms.



2022 Mentorship Programme: A reflection by Nadine Simmonds

Tell us a little bit about yourself:

I am Nadine Simmonds, a pharmacist graduate of North-West University and I have been practising since 2002. During my career, I have been exposed to a wide variety of sector environments: public and private hospital pharmacy, corporate and independent community pharmacy, quality assurance and most recently regulatory within the veterinary medicine space.

Why did you choose to become a mentor?

In many of the environments I have worked, I had interns or pharmacist's assistants assigned to me as a tutor. Recently, because I mostly worked as an independent contractor, I did not have anyone to invest into any longer and dearly missed the opportunity. I thought there would be many more suitable candidates applying to be mentors but I was pleasantly surprised and deeply thankful to be chosen for the 2022 programme.

What were the highlights of your mentorship journey?

What a pleasure it was to have deep conversations about the standing and direction of the profession today! Being able to convey my personal experiences and brainstorm possible solutions to everyday issues was a great honour. Yet my shining highlight of the programme was the deep self-discovery during the Strengths Finder sessions that enabled me to be a better coach and learner all at the same time.

Would you encourage other pharmacists to become mentors?

All pharmacists should at least do this once. This programme is vital for the creation of forward-thinking young leaders in the profession. We all have a story to tell of victories, defeats and a whole lot of learning along the way. Mentoring the up-and-coming professionals will ensure that they don't have to start from scratch, but from experience. That said, the youngsters should avail themselves and be teachable too: this is a two-way street of learning for both mentor and mentee!

Feel free to reach out to us at
Email: ypg@pssa.org.za | Facebook: Young Pharmacists' Group of PSSA | Instagram: @pssaypg
Young pharmacists – connected, engaged, empowered and inspired!

Management of migraine and tension-type headache: an algorithm for pharmacists

R Davidson, N Govender

Keywords: headache, migraine, tension-type headache, medication-overuse headache

S Afr Pharm J 2023;90(2):13-19

Introduction

Headache is one of the most common reasons patients seek help from healthcare practitioners. According to the Global Burden of Disease (GBD) study, headache disorders are among the most prevalent and disabling conditions worldwide. Approximately one-half (52%) of the adult population worldwide is affected by a headache disorder, with the estimated global prevalence of migraine and tension-type headaches (TTH) being 14% and 26% respectively.[1,2] Globally, 86% of people claim to have experienced head pain (either TTH or migraine) at some point in their life, and each day, 15.8% of the world's population have headache.[2,3] Saudi Arabia, South Africa, USA, India, Philippines, Indonesia, and Kenya have the highest prevalence of regular (weekly) head pain (31% or higher).[3]

Pharmacists are in a unique position, as they play an important role in the prevention and management of migraines and TTH.[4] They are often the first healthcare professionals that patients encounter when seeking relief for their head pain, with as many as 57% of headache sufferers seeking pain relief with non-prescription medication.

Most headache diagnoses are based entirely on patient history, and rarely does physical examination provide clues to diagnosis.[1] Although sometimes painful and debilitating, the majority of headaches can be treated with non-prescription painkillers and will disappear after a few hours. This, added to the large numbers of patients presenting to pharmacies for headache relief, without previously seeking advice from a doctor, makes it necessary for pharmacists to provide appropriate guidance and information to patients around headache management and analgesia, as well as signpost patients to onward care as necessary.[3]

The International Classification of Headache Disorders (ICHD) uses a variety of diagnostic criteria to differentiate between the various types of headache. Headache can be divided into two main categories: primary or secondary. A primary headache has no known underlying cause, whilst a secondary headache is the result of another condition causing traction on or inflammation of pain-sensitive structures. The most common primary headaches include migraine and TTH, with medication-overuse headache (MOH) a common secondary headache seen in pharmacy.[5]

Migraine, TTH, and MOH are of public health importance since they are responsible for high levels of disability and ill-health in the population. This article looks at these common types of headaches, along with their causes, treatment, prevention, and when to refer to a doctor.

Migraine headache

Migraine is a primary neurological condition that is characterised by recurrent episodes of headache with other associated symptoms such as nausea, vomiting, and sensitivity to sensory stimuli. Migraines with and without an aura, as well as TTH, as defined by the International Headache Society, are very common diseases all over the world. The one-year prevalence of migraine in adults is 6% among men and 15–18% among women.[6]

It is believed that migraine headaches are dependent upon the activation and sensitisation of the central trigeminal system. Migraine pain begins with the activation of trigeminal nerve fibres surrounding blood vessels. This activation triggers the release of vasoactive and pro-inflammatory neuropeptides, contributing to increased blood flow and plasma extravasation, eventually causing perivascular inflammation. This inflammation sensitises the trigeminal nerve cells to nonspecific stimuli, increasing pain perception. This trigeminal hyper-excitability, known as central sensitisation, results in allodynia and the prolongation of a migraine attack.[4]

Migraine is typically described as a unilateral headache, associated with a wide range of other symptoms that may occur before, during, and after the headache. In the hours to days before the onset of migraine headaches, the majority of patients report symptoms that may include feelings of fatigue, anorexia or food cravings, restlessness, and mood changes.[5] The underlying neurochemical changes leading to these preceding symptoms are not well understood. The ICHD, 3rd edition (ICHD-3), can be used to help with the clinical presentation and diagnosis of migraine (Table I).

Tension-type headache

TTH is the most common type of headache and has the highest economic cost, but is the least studied.[5] TTH affects more than 40% of the adult population worldwide.[1] As many as 90% of adults

Table I: ICHD-3 diagnostic criteria for migraine with and without aura[7]

	Migraine without aura	Migraine with aura
A	At least five attacks fulfilling criteria B–D	At least two attacks fulfilling criteria B and C
B	Headache attacks lasting 4–72 hours (untreated or unsuccessfully treated)	One or more of the following fully reversible aura symptoms: 1. Visual 2. Sensory 3. Speech/language 4. Motor 5. Brainstem 6. Retinal
C	Headache has at least two of the following four characteristics: 1. Unilateral location 2. Pulsating quality 3. Moderate or severe pain intensity 4. Aggravation by or causing avoidance of routine physical activity	At least two of the following four characteristics: 1. At least one aura symptom spreads gradually over ≥ 5 minutes 2. Two or more aura symptoms occur in succession 3. Each individual aura symptom lasts 5–60 minutes 4. At least one aura symptom is unilateral 5. At least one aura symptom is positive 6. The aura is accompanied, or followed within 60 minutes, by headache
D	During headache, at least one of the following: 1. Nausea/vomiting 2. Photophobia and phonophobia	

have had TTH.[8] TTH are more common in females and occurs at any age.[1] TTH is less likely than migraine to cause severe pain and functional impairment.[8] While sufferers of migraines are more likely to miss work, more lost work days are attributable to TTH.[8]

The pathophysiology of TTH is poorly understood, and although there may be a genetic element in the development of TTH, environmental factors likely play a larger role than in migraine. Tenderness of pericranial muscles, co-existing mood disorders, and mechanical disorders of the spine and neck may be contributing factors.[5]

The ICHD-3 subdivides TTH into three major categories based on frequency: infrequent episodic, frequent episodic, and chronic (Table II).

The symptoms, diagnosis, and treatment of TTH significantly overlap with migraine. It is therefore important to differentiate between the two types of headaches.[9] TTH often manifests in response to stress, anxiety, depression, emotional conflicts, and other stimuli (whereas migraine headaches arise from a complex interaction of neuronal and vascular factors, e.g. fatigue, fasting, menses, vasoactive substances in food, etc.).[4,9] Table III lists characteristics that differentiate TTH from migraine headaches.

Dangerous headaches

Most headaches are rarely a sign of something more serious and most people can manage them efficiently with non-prescription analgesics. However, anyone who experiences severe, persistent, recurrent, or worsening headaches should consult a doctor.

Distinguishing dangerous headaches from benign or low-risk headaches is a significant challenge because the symptoms can overlap.[1] The characteristics of dangerous headaches and associated red-flag symptoms that should be referred to a physician are listed in Table IV.

Table II: ICHD-3 diagnostic criteria for TTH

	Infrequent[a] or frequent[b] TTH	Chronic TTH
A	At least 10 episodes of headache fulfilling criteria B–D	Headache occurring on ± 15 days per month on average for > 3 months (± 180 days per year), fulfilling criteria B–D
B	Lasting from 30 minutes to 7 days	Lasting hours to days, or unremitting
C	At least two of the following four characteristics: 1. Bilateral location 2. Pressing or tightening (non-pulsatile) quality 3. Mild or moderate pain intensity 4. Not aggravated by routine physical activity	At least two of the following four characteristics: 1. Bilateral location 2. Pressing or tightening (non-pulsatile) quality 3. Mild or moderate pain intensity 4. Not aggravated by routine physical activity
D	Both of the following: 1. No nausea/vomiting 2. Either photophobia or phonophobia	Both of the following: 1. Only photophobia, phonophobia, or mild nausea 2. Neither moderate or severe nausea nor vomiting

[a]Infrequent TTH – Defined as pain on < 1 day per month on average
[b]Frequent TTH – Defined as pain on 1–14 days per month on average for > 3 months

Table III: Characteristics differentiating TTH from migraine headache[10]

	TTH	Migraine headache
Location	• Bilateral • Over the top of head, extending to base of skull	• Usually, unilateral
Nature of pain	• Varies from diffuse to tight, pressing, constricting pain	• Throbbing/pulsating • May be preceded by aura • Aggravated by routine physical activity
Onset	• Gradual	• Sudden
Duration	• 30 minutes to 7 days	• 4–72 hours

Table IV: Red flag signs and symptoms for referral[1,5,11-13]

Red flags		
Emergent (Immediate referral)	**Urgent**	**Indicators of secondary headaches**
Thunderclap onset • Severe headache with onset of pain within 5 minutes	Elderly patient: new headache with cognitive change	New headache that has recently started in a person older than 50 years of age
Symptoms of acute narrow-angle glaucoma • Painful red eye, misty vision, haloes and semi-dilated pupil	Frequent headaches (≥ 10 per month), change in headache pattern and severity, headaches lasting more than 72 hours	Unexplained focal signs
Infection symptoms • Fever (especially with stiff neck and reduced consciousness)		Atypical headaches
Neurological (related to the brain) symptoms • Stiff neck • Reduced consciousness • Change in personality • Cognitive dysfunction that has recently started • Neurological dysfunction that has recently started		Unusual headache precipitants
Symptoms of stroke • Drooping face, paralysis on one side of body, slurred/ jumbled speech		Unusual aura symptoms
		Aggravation by neck movement

Table V: Non-pharmacological strategies[7,9,10]

Lifestyle changes	Migraine	TTH
Pay attention to food and beverages as they can trigger migraine attacks	Possible triggers include red wine (sulphites), aged cheeses, and chocolate.	
Good sleeping and eating patterns	Keep a regular schedule of sleep, exercise, and good nutrition. Poor sleeping and eating patterns are triggers for headaches.	Getting enough sleep.
Rearrange work or study areas to avoid physical strain	For example, moving computer screens to eye level. Lowering chairs so that thighs are parallel to the floor, using a lumbar roll to maintain good sitting posture, and using a phone headset instead of cradling the phone on the neck.	Improving sitting and standing posture.
Stretching	Gentle stretching exercises and relaxation techniques to prevent neck pain. Heat and ice to relieve neck pain as well as gentle stretching to help loosen tension in the neck is recommended.	Regular exercise and stretching.
Eyesight/emotional wellbeing		Having an eye test. Management of stress, anxiety, or depression.
Limit caffeine intake	Limiting caffeine intake to no more than two cups a day to avoid caffeine withdrawal headaches.	
Limit pain medication intake	Limiting the use of non-prescription pain medicines, or decongestants (such as pseudoephedrine) to no more than two days a week for headaches, to avoid MOH.	

General treatment approach to migraine and TTH management

Management aims to ease the severity of symptoms and reduce functional impairment, rather than achieve the complete cessation of pain. As for any complex condition, both non-pharmacological and pharmacological management are required.[9] Appropriate treatment should consider the patient's medical comorbidities, preferences and needs, symptoms, and their frequency, severity, and impact on quality of life.[10] Additionally, it is very important to educate patients on the importance of limiting the use of non-prescription analgesics to no more than two days per week, as overuse of analgesics can lead to MOH.[4]

Non-pharmacological strategies

The first step to the management of headaches should include lifestyle changes. Table V provides some examples of non-pharmacological strategies.

Pharmacological treatment: basic analgesia[5,8,10,11]

Basic analgesia, with non-prescription analgesics such as paracetamol or nonsteroidal anti-inflammatory drugs (NSAIDs), is recommended for mild to moderate pain associated with migraine and TTH (Table VI). Opioids like codeine should not be routinely recommended owing to the high risk of developing MOH and the risk of withdrawal symptoms on cessation. If a treatment is effective, there should be a significant response within two hours (e.g. significant reduction or complete relief of pain). If this is not the case, an alternative treatment or combination treatment should be considered. It is very important to educate patients on the importance of limiting the use of analgesics to no more than two days per week, as overuse of analgesics can lead to MOH.[4]

Pharmacological strategies for migraine and TTH management

Paracetamol[4,13-15]

Paracetamol is a well-established analgesic and is often recommended as first-line drug treatment in mild to moderate pain states, including headaches. It has a central analgesic effect that is mediated by the inhibition of prostaglandin (PG) synthesis; through the activation of descending serotonergic pathways and an active metabolite influencing cannabinoid receptors.

Randomised, double-blind, placebo-controlled studies have documented the superiority of paracetamol over placebo in patients with migraine and TTH.[14,15] Paracetamol can also be combined with muscle relaxants such as orphenadrine, and this can also be used as an option should paracetamol alone not offer relief, especially when there is tension in the back of the head and/or neck.

Aspirin

Aspirin has analgesic and anti-inflammatory properties and is an irreversible inhibitor of the enzyme cyclo-oxygenase, which results in the direct inhibition of the biosynthesis of PGs from arachidonic acid. Aspirin is used for the relief of mild to moderate pain and acute inflammation. High-dose aspirin (900–1000 mg) has been established as an effective treatment option for acute migraine and TTH.[15]

Nonsteroidal anti-inflammatory drugs[4,13,16]

NSAIDs are a group of drugs that possess anti-inflammatory and analgesic properties due to reversible inhibition of cyclo-oxygenase and thus PG synthesis. Common non-prescription NSAIDs include ibuprofen, diclofenac, and naproxen. NSAIDs in general are a good starting point for acute migraines and TTH. They represent the most used acute therapy for both migraine and TTH.[16] Several clinical studies have demonstrated the efficacy of ibuprofen in the management of migraine, with doses ranging from 200 mg to 1 200 mg. Both the 200 mg and 400 mg tablets have been proven to provide clinical benefit two hours post-administration.

Caffeine as an adjuvant[17,18]

Caffeine has been added to formulations containing aspirin, paracetamol, and other NSAIDs for some time and the effects of caffeine in combination with aspirin (and other NSAIDs) and paracetamol have been examined in detail.[18] Compared with analgesic medication alone, combinations of caffeine with analgesic medications, including paracetamol, aspirin, and NSAIDs, showed significantly improved efficacy in the treatment of patients with migraine or TTH, with favourable tolerability in the vast majority of patients.[17]

Multimodal analgesia[19]

Multimodal analgesia is a pharmacological method of pain management which combines various groups of medications for pain relief. The scientific rationale behind multi-target combinations is the therapeutic benefit that could not be achieved by the individual constituents and that the single substances of the combinations act together additively or even multiplicatively. As an example, the fixed-dose combination of acetylsalicylic acid

Table VI: Common non-prescription medicines to manage migraine and TTH[10,21]

Migraine	TTH
• Ibuprofen 400 mg 8 hourly • ASA 1 000 mg 8 hourly • Naproxen sodium 500–550 mg 8–12 hourly • Paracetamol 1 000 mg 4–6 hourly (max 4 g per 24 hours) • Diclofenac 50 mg 8 hourly • Adjuvants, e.g. caffeine • Fixed-dose combination analgesics (with codeine if necessary, however not recommended for routine use) • Ergots, triptans, anti-nausea (e.g. cyclizine)	• Ibuprofen 400 mg 8 hourly • ASA 1 000 mg 8 hourly • Naproxen sodium 500–550 mg 8–12 hourly • Paracetamol 1 000 mg 4–6 hourly (max 4 g per 24 hours) • Diclofenac 50 mg 8 hourly • Adjuvants, e.g. caffeine, muscle relaxants • Fixed-dose combination analgesics (with codeine if necessary, however not recommended for routine use)

Calpol Tablets

Release starts here

With Optizorb formulation to improve paracetamol absorption providing more predictable pain relief*[2]:

- Starts releasing its medicine in 5 minutes[2]
- Has 2x better absorption than standard paracetamol[#2]
- Starts to relieve pain in just 15 minutes*[2]
- Improved absorption for consistent pain relief*[2,3]

WITH OPTIZORB FORMULATION

Calpol Tablets for 'Adults[1]' contain 500 mg Paracetamol

5X RELEASES MEDICINE FASTER*[1]

Help **Release** their pain.
Have pain management discussions with your patients.

*Than standard paracetamol1 tablets. #From 20 minutes to 50 minutes.

References: 1. CALPOL TABLETS Package Insert. November 2020. 2. Wilson CG, Clarke CP, Starkey YY, Clarke D. Comparison of a novel fast-dissolving acetaminophen tablet formulation (FD-APAP) and standard acetaminophen tablets using gamma scintigraphy and pharmacokinetic studies. Drug development and industrial pharmacy. 2011 Jul. 1;37(7):747-53. 3. Clarke C, et al. A new fast dissolving tablet formulation of paracetamol (Calpol Tablets with Optizorb Technology) reduces variability of absorption – results of a repeat dose pharmacokinetics study. Presented at the International Association for the Study of Pain (IASP) conference.

Table VII: Assessment and management of MOH[20]

Assess	Manage
• Taking prescription medicines for ≥ 10 days per month (e.g. ergots, triptans, combination analgesics, or codeine or other opioids); OR • Taking OTC analgesics for ≥ 15 days per month (e.g. paracetamol, NSAIDS, aspirin) • Occurs daily or nearly daily • Often the worst first thing in the morning – after waking up • Tends to get worse when medicine is stopped	• Educate patient • Consider prophylactic medication • Provide an effective acute medication for severe attacks with limitations on frequency of use • Gradual withdrawal of combination analgesics with opioids • Abrupt (or gradual) withdrawal of paracetamol, NSAIDs, or triptans

(ASA), paracetamol, and caffeine provide more rapid and superior pain relief compared to ibuprofen. The major advantage of using such a fixed combination is that the active ingredients act on different but distinct molecular targets and thus can act on more signalling cascades involved in pain than most single analgesics without adding more side effects to the therapy. Common non-prescription combination analgesics contain combinations of paracetamol, aspirin, NSAIDs, caffeine, and codeine. There is substantial clinical evidence that such a multi-component therapy is more effective than mono-component therapies. This broadens the array of therapeutic options and enables the completeness of the therapeutic effect. It also allows pharmacists to customise treatment to the patient's specific needs and is an opioid-sparing strategy.[19]

Medication-overuse headache[20]

An unintended consequence of the management of patients with established primary headache disorders like migraine or TTH is MOH. Patients with migraine or TTH overuse medication for their acute headaches and inadvertently increase the frequency and intensity of their headaches. As this vicious cycle of further drug consumption and increased headache frequency develops, it transforms the treatment for their headache into the actual cause of their disease (MOH). The diagnosis of MOH is related to

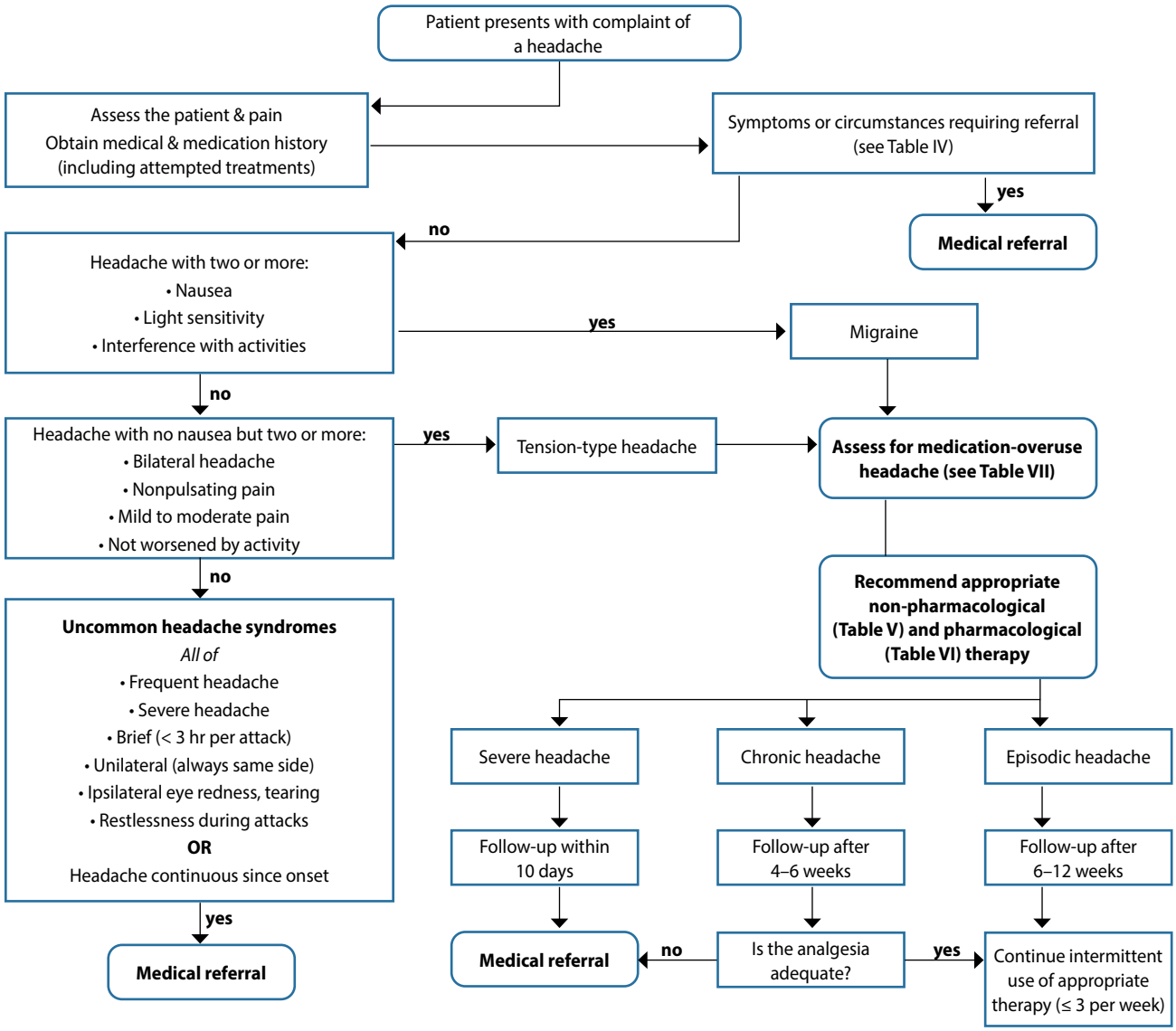


Figure 1: Point-of-care approach to migraine and TTH management
Adapted from Becker et al.[13] and Berardi et al.[21]

the frequency of a headache (not quality or intensity) and the management approach includes patient education, effective prophylaxis, discontinuation of the overused analgesic, and follow-up to prevent a recurrence (Table VII).[20]

Point-of-care management

In the pharmacy setting, the successful management of patients with migraine or TTH depends on adequate assessment, pharmacological management, as well as identifying headache sufferers that require referral. Figure 1 summarises a point-of-care approach to migraine or TTH management.

Conclusion

Headache severity and associated features, such as nausea, vomiting, or previous treatment responses, can guide the selection of medication for acute treatment. Simple analgesics or NSAIDs, with or without antiemetics, are usually the first-line treatment and are effective in treating migraine and TTH. Multi-component therapy represents second-line therapies and allows the pharmacist to customise treatment to the patient's specific needs, with the additive benefit of sparing the use of opioids.

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COVID-19 vaccine acceptability amongst South African pharmacists

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Abstract

Background: Phase III trials, corroborated by early post-marketing data globally show that COVID-19 vaccination reduces the risk of severe disease, hospitalisation and death. Despite this, vaccine hesitancy persists amongst some healthcare workers. This study aimed to assess the acceptability of the COVID-19 vaccine amongst South African pharmacists and highlight vaccine-related concerns and predictors of vaccination hesitancy.

Methods: Nested within an online survey (14 April 2021 to 18 May 2021) assessing the mental health of South African pharmacists during the COVID-19 pandemic, vaccine acceptability and vaccine-related concerns were studied. A multivariate logistic regression analysis identified factors associated with vaccine hesitancy.

Results: From 2 454 registered South African pharmacists sampled, 755 responded to the vaccine acceptability survey (response rate: 30.8%). Vaccine acceptability was 71.9%, while 72.4% and 53.3% were concerned about serious COVID-19 vaccine-related side effects and the lack of vaccine safety data, respectively. Pharmacists aged 20–30 years were more likely to be vaccine-hesitant compared to those aged > 60 years (aOR 3.2, 95% CI 1.1–9.6). Compared to their Caucasian colleagues, Black/African pharmacists were twice as likely to be vaccine-hesitant (aOR2.2, 95% CI 1.2–4.0).

Conclusion: COVID-19 vaccine hesitancy among South African pharmacists exists amongst a small but significant proportion. Targeted interventions to address concerns are necessary.

Keywords: COVID-19, vaccine hesitancy, pharmacists, acceptability, SARS-CoV-2, South Africa

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Introduction

The novel Coronavirus disease 2019 (COVID-19) pandemic continues to have devastating effects globally, with over 4 million positive cases identified in South Africa, accounting for over 100 000 deaths, as at 25 January 2023.[1] Strategies to combat the spread of COVID-19, in South Africa, follow the global norms of mask-wearing in public, social distancing, isolation if COVID-19 positive patients and strategic countrywide lockdowns to reduce viral spread. Despite these non-pharmaceutical interventions, without an effective treatment or cure, high COVID-19 vaccination rates are a public health priority.[2,3] The race for a safe and effective COVID-19 vaccine began when COVID-19 was first sequenced in 2020, and as of 5 December 2022, more than 30 vaccines have undergone rigorous clinical trial testing and are authorised for use by several regulatory authorities globally with several vaccine candidates still under development.[4,5] The main benefits of COVID-19 vaccination include protecting oneself from severe disease, hospitalisation and death and, in turn, protecting others by reducing transmission.[2,3] High vaccination coverage would therefore reduce the significant burden that severe infection causes on the healthcare system and healthcare workers (HCWs). Consequentially, with reduced transmission amongst the vaccinated, virus spread and viral evolution will decrease, reducing the risk of the emergence of variants of concern with the potential to escape vaccine neutralisation.[6]

It is postulated that the spread of the pandemic could be slowed if herd immunity against the virus, through vaccination, is acquired by more than 67% of the population.[7] However, achieving herd immunity by vaccination depends on vaccine acceptability and uptake, a goal that can be hampered not only by lack of availability and access but also by vaccine hesitancy, defined as the delay in acceptance or refusal of vaccination despite its availability.[8,9] Vaccine hesitancy is influenced by various factors such as complacency (low risk perception), lack of confidence in the vaccine (by expressing concerns over the efficacy and safety), and convenience (including ease of access and availability of vaccines).[10] The consequence of vaccine hesitancy can have detrimental effects for both the individual by increasing their risk of having the disease, and potentially the community because of greater virus transmission. Vaccine hesitancy is a key determinant of a COVID-19 vaccination programme's success or failure.[11] In South Africa, the COVID-19 vaccine first became available in February 2021, with frontline HCWs, pharmacists included, receiving priority access.[12] As of 2 December 2022, there has been a total of six vaccines approved for use in South Africa, with over 38 million vaccines administered as of 30 January 2023.[13,14]

COVID-19 vaccine hesitancy by frontline pharmacists and advice provided to patients by pharmacists could be influenced by their own perceptions, which will affect the public's decision to get vaccinated.[15] The current study aimed to assess and understand

the acceptability of the COVID-19 vaccine amongst South African pharmacists, highlight vaccine-related concerns and identify predictors of vaccination hesitancy to better support the national COVID-19 vaccination programme in South Africa.

Research methods and design

Study design and setting

This quantitative cross-sectional study, nested within a parent online survey assessing the mental health of South African pharmacists during COVID-19, also assessed vaccine acceptability, attitudes towards vaccination and vaccine-related concerns. The online survey questionnaire, hosted on SurveyMonkey®, was accessed via a web link in the invitation email detailing information about the purpose and scope of the survey.

Study population and sampling strategy

An electronic list of registered pharmacists, which included their email addresses, was obtained from the South African Pharmacy Council (SAPC). Stratified random sampling, based on the pharmacists' location by province in South Africa was used and the overall target sample size was 2 454 individuals. Pharmacists who were between 18–65 years old, currently registered to practice in all pharmacy sectors in South Africa, had a valid email address, were able to read and understand English and provided consent to use anonymised survey data, were eligible and included in this study. The survey was accessible from 14 April to 18 May 2021.

Data collection

Sociodemographic data, clinical characteristics, COVID-19 risk perception and attitudes and concerns related to COVID-19 vaccination were assessed. When the survey was open, only the Johnson & Johnson®: Ad26.COV2. S vaccine was available to HWCs.

Data analysis

To assess COVID-19 vaccine acceptance, pharmacists were asked, "If any vaccine to prevent COVID-19 were offered to you today, will you take it?", those who responded 'Yes' to this question were considered as vaccine acceptors and those who responded 'No' were considered as vaccine-hesitant. The data was analysed using SAS version 9.4 (SAS Institute, Cary, North Carolina). A chi-square analysis was performed to determine how well-matched the demographics of the overall sample of vaccine-accepting and -hesitant respondents were. A multiple logistic regression model (MLRM) was used to determine factors and possible interactions associated with vaccine hesitancy. To build the best fit MLRM, a bivariate analysis of associations between vaccine hesitancy and each covariate using a chi-square test was performed. Potential covariates to add to the build-up of the MLRM had a *p*-value less than 0.05. To assess possible confounders, a chi-square test of association was performed between the covariates. The resulting estimates from the MLRM are reported as adjusted odds ratios (aORs) and their corresponding 95% confidence intervals (CIs).

Results

From the targeted sample size of 2 454 pharmacists who were sent the survey, a total of 755 responses to the vaccine acceptability survey were received for an overall response rate of 30.8%.

COVID-19 vaccine acceptability was 71.9% among respondents. Sociodemographic and other characteristics were assessed and compared based on vaccine acceptance or vaccine hesitancy status (Table I). Among the 212 vaccine-hesitant pharmacists, 127 (59.9%) were under 40 years old, the majority were female (76.4%), 44.8% were Caucasian, and 50.9% worked in community/retail pharmacy. Pre-existing health conditions were reported in 29.7% of those classified as vaccine-hesitant, while the majority of the hesitant (71.2%) perceived themselves to be at medium/high risk of contracting COVID-19.

Pharmacists expressed several vaccine-related concerns (Table II). Serious side effects related to the vaccine and a perception of insufficient safety data availability were concerns expressed by 89.6% and 74.1% of the vaccine-hesitant, respectively. Despite these, 68.9% and 68.5% of all pharmacists sampled indicated receiving a COVID-19 vaccine will positively impact their well-being and work-life respectively. The majority of the respondents (505; 66.9%) indicated that media or social media did not affect their decision to get vaccinated. More than half of the respondents (451; 59.7%) indicated that they were comfortable with the selection and scheduling of the COVID-19 vaccine that was currently available (i.e., the single dose of the Johnson and Johnson® vaccine).

Pharmacists' attitudes/feelings toward a COVID-19 vaccine being made available to HCWs in South Africa was assessed (Figure 1). Some of the 'Other' feelings reported by 15 pharmacists were positive, e.g., "gratitude, happy that things can get back to normal sooner", while some negative responses included "distrust, feeling like a 'guinea pig', the vaccine being a 'germ warfare' and 'a waste of money', pessimistic and embarrassment at the slow roll-out of the vaccination programme".

Results of the multivariate logistic regression used to determine potential risk factors for vaccine hesitancy (Table III) show that compared to their older colleagues (> 60 years), pharmacists aged 20–30 years were three times more likely to be vaccine-hesitant (aOR 3.2, 95% CI 1.1–9.6). In addition, Black/African pharmacists were more likely to be vaccine-hesitant than their Indian/Asian or Caucasian colleagues (aOR 2.2, 95% CI 1.2–4.02). Pharmacists working in a community/retail pharmacy were twice as likely to be vaccine-hesitant compared to those working in other sectors of pharmacy (aOR 1.9, 95% CI 1.3–2.7). Pharmacists who did not work in a private hospital/clinic but perceived themselves to be at medium/high risk of COVID-19 were less likely to be vaccine-hesitant. Furthermore, pharmacists aged between 31–40 years that had pre-existing chronic health conditions had a 64% lower likelihood of being vaccine-hesitant (aOR 0.4, 95% CI 0.3–0.7), while the odds of being vaccine-hesitant among those aged between 41–50 years that had pre-existing chronic health conditions were almost three-fold (aOR 2.7, 95% CI 1.3–5.8).

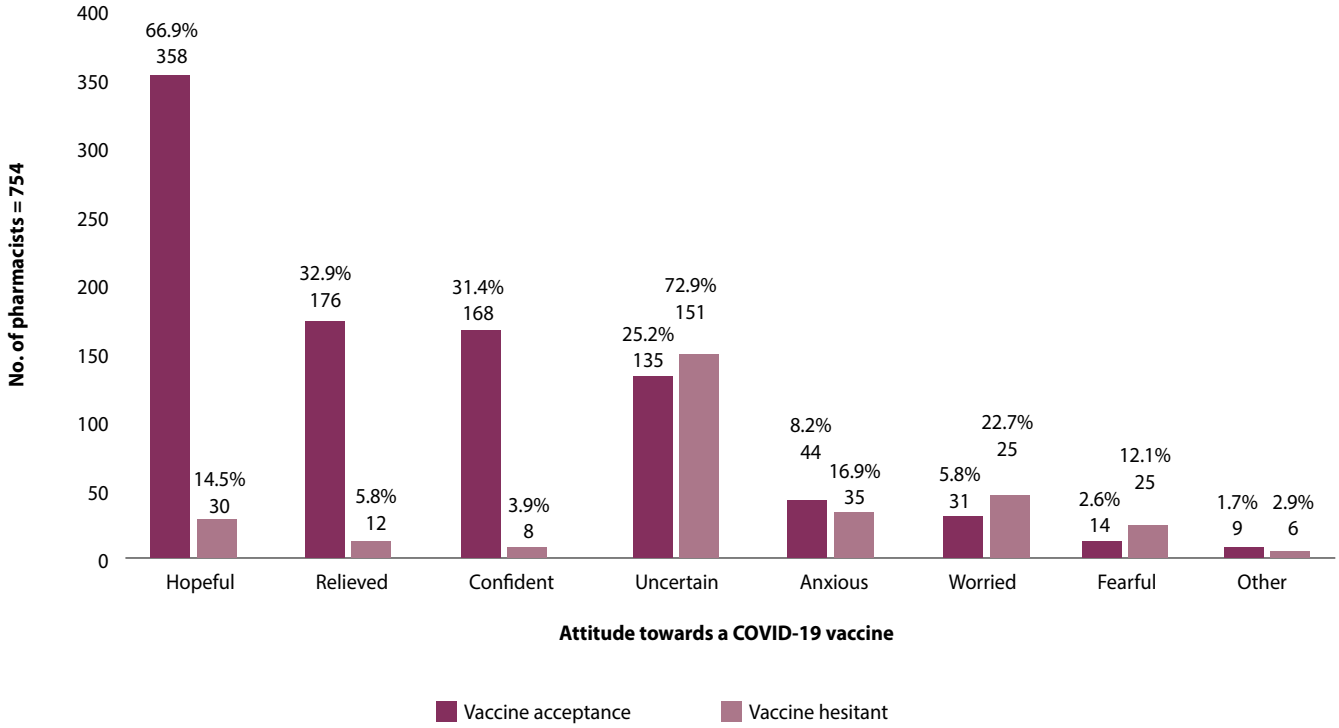

Figure 1: Pharmacists' attitude towards the COVID-19 vaccine availability in South Africa (*n* = 742)

Table I: Sociodemographic and other characteristics of survey respondents (*n* = 755)

Variables		Categories	Total *n* = 755	Vaccine acceptance *n* = 543 (71.9%)	Vaccine hesitant *n* = 212 (28.1%)	*p*-value
Socio-demographics	Age (years)	20–30	160 (21.2)	103 (19)	57 (26.9)	**0.029**
		31–40	225 (29.8)	155 (28.5)	70 (33)	
		41–50	167 (22.1)	128 (23.6)	39 (18.4)	
		51–60	155 (20.5)	118 (21.7)	37 (17.5)	
		> 60	48 (6.4)	39 (7.2)	9 (4.2)	
	Gender	Female	591 (78.3)	429 (79)	162 (76.4)	0.438
		Male	164 (21.7)	114 (21)	50 (23.6)	
	Race/ethnicity	Caucasian/White	371 (49.1)	276 (50.8)	95 (44.8)	**< 0.001**
		Indian/Asian	186 (24.6)	147 (27.1)	39 (18.4)	
		Black/African	157 (20.8)	89 (16.4)	68 (32.1)	
		Coloured	41 (5.4)	31 (5.7)	10 (4.7)	
	Marital status	Married	480 (63.6)	347 (63.9)	133 (62.7)	0.912
		Never married	173 (22.9)	123 (22.7)	50 (23.6)	
		Divorced	49 (6.5)	36 (6.6)	13 (6.1)	
		Living together as married partners	39 (5.2)	26 (4.8)	13 (6.1)	
		Widowed	14 (1.9)	11 (2)	3 (1.4)	
	Highest qualification	Bachelors	616 (81.6)	434 (79.9)	182 (85.8)	0.158
		Masters	119 (15.8)	94 (17.3)	25 (11.8)	
		Doctoral	20 (2.6)	15 (2.8)	5 (2.4)	
	Professional experience (years)	0–5	129 (17.1)	82 (15.1)	47 (22.2)	**0.007**
		5–10	133 (17.6)	86 (15.8)	47 (22.2)	
		10–20	206 (27.3)	156 (28.7)	50 (23.6)	
		≥ 20	287 (38)	219 (40.3)	68 (32.1)	

Socio-demographics	Current pharmacy practice sector*	Community/retail pharmacy	334 (44.2)	226 (41.6)	108 (50.9)	**0.021**
		Public hospital or clinic	173 (22.9)	126 (23.2)	47 (22.2)	0.761
		Pharmaceutical industry	114 (15.1)	77 (14.2)	37 (17.5)	0.259
		Private hospital or clinic	100 (13.2)	81 (14.9)	19 (8)	**0.030**
		Pharmaceutical wholesaler/ distributor	36 (4.8)	28 (5.2)	8 (3.8)	0.423
		Academia	27 (3.6)	21 (3.9)	6 (2.8)	0.490
		Research pharmacy	23 (3)	18 (3.3)	5 (2.4)	0.492
		None of the above	55 (7.3)	43 (7.9)	12 (5.7)	
	Province (geographic/ practice location)	Gauteng	279 (37)	201 (37)	78 (36.8)	0.138
		KwaZulu-Natal	146 (19.3)	112 (20.6)	34 (16)	
		Western Cape	135 (17.9)	101 (18.6)	34 (16)	
		Eastern Cape	62 (8.2)	42 (7.7)	20 (9.4)	
		North West	40 (5.3)	28 (5.2)	12 (5.7)	
		Limpopo	32 (4.2)	17 (3.1)	15 (7.1)	
		Mpumalanga	27 (3.6)	16 (2.9)	11 (5.2)	
		Free State	19 (2.5)	13 (2.4)	6 (2.8)	
		Northern Cape	15 (2)	13 (2.4)	2 (0.9)	
Clinical characteristics	Pre-existing chronic health conditions	Yes	251 (33.2)	188 (34.6)	63 (29.7)	0.199
		No	504 (66.8)	355 (65.4)	149 (70.3)	
	History of a mental health condition/s	Yes	136 (18)	103 (19)	33 (15.6)	0.274
		No	619 (82)	440 (80)	179 (84.4)	
	Ever tested positive for COVID-19	Yes	145 (19.2)	111 (20.4)	34 (16)	0.167
		No	610 (80.8)	432 (79.6)	178 (84)	
Influence of the COVID-19 pandemic	Lived apart from immediate family during the pandemic	Yes	238 (31.5)	165 (30.4)	73 (34.4)	0.282
		No	517 (68.5)	378 (69.6)	139 (65.6)	
	Risk perception of contracting COVID-19 at work	Low	181 (24)	120 (22.2)	61 (28.8)	0.057
		Medium-high	572 (76)	421 (77.8)	151 (71.2)	
		Missing	2 (0.3)			

* $n = 862$, pharmacists practised across multiple sectors during the pandemic, $p < 0.05$ indicated in bold

Table II: Pharmacists' concerns about the COVID-19 vaccine ($n = 755$)

Concern expressed	Total $n = 755$	Vaccine acceptance $n = 543$ (71.9%)	Vaccine hesitant $n = 212$ (28.1%)	*p*-value
I am concerned about experiencing a serious side effect from a COVID-19 vaccination	406 (72.4)	233 (63.3)	173 (89.6)	**0.004**
There is not enough data about the safety of the vaccine	299 (53.3)	156 (42.4)	143 (74.1)	0.488
The vaccination roll-out strategy may not be implemented as planned and in time	251 (44.7)	217 (59)	34 (17.6)	**< 0.0001**
The vaccine development process was too fast	223 (39.8)	104 (28.3)	119 (61.7)	0.3485
I may have access to the vaccine, but I am concerned about access for my family	156 (27.8)	138 (37.5)	18 (9.3)	**< 0.0001**
I am concerned that pharmacists will not be included in the first phase of the vaccination roll-out strategy	130 (23.2)	117 (31.8)	13 (6.7)	**< 0.0001**
Other vaccine-related concerns (*n*): • vaccine effectiveness in people who previously contracted the virus (6) • safe use in pregnancy and breastfeeding (7) • lack of data on boosters, resistance, and effect on new strains (7) • complacency after vaccination (5) • vaccine production challenges and maintenance of cold chain (7) • lack of individual choice in vaccine selection (14) • influence of social media influences on vaccine acceptability (7)	53 (9.4)	35 (9.5)	18 (9.3)	0.028

$p < 0.05$ indicated in bold

Table III: Multivariate logistic regression of potential risk factors for vaccine hesitancy in South African pharmacists

Variable	Categories *(Reference)*	*p*-value	Vaccine hesitancy aOR [95% CI]
Gender	Female *(Male)*	0.8439	0.960 [0.641, 1.439]
Age (years)	20–30 *(> 60)*	0.0325	*3.223 [1.083, 9.591]
	31-40 *(> 60)*	0.4951	1.656 [0.577, 4.751]
	41–50 (> 60)	0.4462	1.706 [0.600, 4.854]
	51–60 (> 60)	0.6037	1.534 [0.543, 4.336]
Ethnicity	Black/African *(Caucasian)*	0.0065	*2.174 [1.175, 4.021]
	Indian/Asian *(Caucasian)*	0.7534	0.789 [0.428, 1.456]
	Coloured (*Caucasian*)	0.9340	0.786 [0.277, 2.232]
	Black/African *(Indian/Asian)*	0.0004	*2.755 [1.427, 5.319]
	Black/African *(Coloured)*	0.0704	2.767 [0.946, 8.093]
	Indian/Asian *(Coloured)*	1.0000	1.005 [0.337, 2.996]
Tested positive for COVID-19	Yes *(No)*	0.0658	0.650 [0.411, 1.029]
Pharmacy practice sector			
Private hospital or clinic	Yes *(No)*	0.0285	*0.399 [0.176, 0.908]
Community/retail pharmacy	Yes *(No)*	0.0011	*1.861 [1.281, 2.702]
Interaction effect			
Private hospital or clinic	**Perceived risk of contracting COVID-19**		
Yes	Medium-High (*Low*)	0.2841	2.380 [0.487, 11.633]
No	Medium-High (*Low*)	0.0002	*0.447 [0.291, 0.686]
Age (years)	**Presence of chronic disease**		
20–30	Yes (*No*)	0.1349	1.978 [0.809, 4.836]
31–40	Yes (*No*)	0.0107	*0.361 [0.166, 0.789]
41–50	Yes (*No*)	0.0111	*2.701 [1.255, 5.813]
51–60	Yes (*No*)	0.9995	1.000 [0.465, 2.151]
60	Yes (*No*)	0.5054	1.696 [0.358, 8.036]

aOR – adjusted odds ratio, *aOR, CI and $p < 0.05$

Discussion

This cross-sectional survey of 755 South African pharmacists demonstrated COVID-19 vaccine hesitancy in 28.1% of respondents.

Ethnicity (Black/African), younger pharmacists (aged between 20–30), pharmacy practice sector (those working in community/retail pharmacies) and pharmacists between 41–50 years with pre-existing chronic conditions were predictive of vaccine hesitancy.

While the majority of pharmacists reported a positive attitude towards the availability of the COVID-19 vaccine (hopeful, relieved and confident), more than half of respondents (63%) indicated that they had concerns about the COVID-19 vaccine and concerns about experiencing a serious side effect from a COVID-19 vaccination being the major concern reported. In this study, the acceptance of the COVID-19 vaccine among pharmacists was lower (71.9%) than both the average acceptance of 74% amongst HCWs globally,[16] and 90.1% amongst non-pharmacist HCWs in South Africa.[17] Several other studies evaluating the acceptance rate of the COVID-19 vaccine amongst HCWs, in various parts of the world, found the vaccine acceptance to range from 27.7–91.7%.[18-26] Two studies in the USA focused on the COVID-19 vaccine acceptability among pharmacists and reported an acceptance rate of 67.1% and 69%.[27,28] The vaccine acceptance rate observed in this cohort of South African pharmacists could partially be ascribed to the limited availability of vaccine-related information for the vaccine being administered 'under clinical trial' conditions at the time of the survey.[29]

Similar to the current study, previous studies found vaccine acceptance to be significantly higher amongst Asian HCWs than their African/Black colleagues.[18] Other significant factors for vaccine hesitancy were previous COVID-19 infection[19,26] and younger age (≤ 34 years).[26] Furthermore, in contrast to the current study, younger age, those aged between 21–30 years[20] and 31–40 years were associated with vaccine acceptance,[21] as was male gender.[18,19]

Furthermore, some concerns expressed by pharmacists are congruent with previous reports, including mistrust in the vaccine due to its rapid development, serious side effects from vaccination,[26,27] insufficient safety and effectiveness data,[17,19,24-26] and lack of trust in authorities and pharmaceutical companies.[20]

Additionally, in April 2021, vaccination of HCWs was temporarily paused in South Africa due to concerns about the safety of the

vaccine and the emergence of blood clots in people who have been vaccinated with the Johnson and Johnson® vaccine in the United States,[30] and although it was considered a rare event,[30] this could have heightened vaccine hesitancy among South African HCWs, particularly those with pre-existing conditions.

This study has several limitations. Firstly, the investigators relied on the South African Pharmacy Council records for the current validity of the pharmacist's email addresses and geographic location; in some instances, email addresses or geographical location was omitted. It was therefore impossible to estimate the true participation rate and hence the representativeness of the sample. Secondly, the low response rate (30.8%) may impact the generalisability of study findings. Thirdly, limited vaccine options and limited data regarding the safety and effectiveness of the vaccine were available at the time of the survey, which would have impacted the responses. Lastly, this survey did not enquire about the professional advice pharmacists would actually give their patients regarding COVID-19 vaccination; hence this data could not be extrapolated further.

Despite these limitations, this is the first documented study to assess the COVID-19 vaccine acceptability and concerns among South African pharmacists. Interventions, such as public acknowledgements of vaccinations made via professional associations, providing pharmacists with continuous and updated vaccine information, and using positive reinforcements such as offering ethical incentives to vaccinated pharmacists who support evidence-based vaccination strategies, can be utilised to improve vaccine acceptability among this group of HCWs. As a trusted and easily accessed cadre of HCWs, ongoing assessment and understanding of COVID-19 vaccine hesitancy among pharmacists in South Africa is needed considering that several vaccines have since been approved by the South African Health Products Regulatory Authority and the mass roll-out of vaccines have been carried out.

Conclusion and recommendations

Vaccine acceptability amongst South African pharmacists was lower than the average acceptance rate amongst HCWs globally. Most pharmacists were concerned about serious COVID-19 vaccine-related side effects and the lack of vaccine safety data. Pharmacists aged 20–30 years were more likely to be vaccine-hesitant compared to those aged > 60 years. Compared to their Caucasian colleagues, Black/African pharmacists were twice as likely to be vaccine-hesitant.

Interventions that help to understand and ease pharmacists' concerns could improve their COVID-19 vaccine knowledge, vaccination uptake and positively influence the populations they serve.

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Conflict of interest

The authors declare no conflict of interest.

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Ethical approval

This report is a component of a cross-sectional study which assessed the mental health outcomes and workplace quality of life in pharmacists during the second wave of the COVID-19 pandemic in South Africa. Ethics approval was received from the Biomedical Research Ethics Committee, University of KwaZulu-Natal, South Africa (Ref# BREC/00002511/2021).

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An overview of sore throat, strep throat and tonsilitis

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Abstract

Pharyngitis and tonsilitis are common reasons why people seek medical care. These diseases are commonly caused by viral and bacterial infections, with group A β-haemolytic streptococcus being pharyngitis's most common bacterial pathogen. The majority of tonsilitis cases are of viral aetiology. The symptoms of viral and bacterial infections often overlap, making it difficult to distinguish them. These symptoms generally resolve within a few days with symptomatic treatment, however, in some cases, the use of antibiotics is necessary. The prescription of antibiotics for the treatment of pharyngitis and tonsilitis should be justified to avoid irrational antibiotic prescribing, which contributes to antimicrobial resistance. This article provides a brief overview of the symptoms, diagnostic methods, and treatment of pharyngitis and tonsilitis.

Keywords: Group A β-haemolytic streptococcus, penicillin pharyngitis, strep throat, tonsilitis

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Pharyngitis

During the recent outbreak of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a lot of individuals suffered from a sore throat, one of the symptoms that signify a SARS-CoV-2 infection.[1] In primary healthcare, a sore throat/pharyngitis is one of the common reasons why patients consult with their medical practitioners.[2] Though viral infections are responsible for some pharyngitis cases, 20–35% of cases are of bacterial aetiology, specifically, the group A β-haemolytic streptococcus (GABHS/strep throat).[3]

Although studies on the global incidence of GABHS infection in adults are limited, approximately 288.6 million annual cases of strep throat occur amongst children aged 5 to 14 years globally, which accounts for more than 100 000 disability-adjusted life-years globally.[4] Additionally, one in three children experience one or more episodes of a sore throat over a 12-month period.[4] Based on 2005 estimates, it was postulated that GABHS is the 5th most lethal pathogen, causing 163 000 global deaths annually.[5]

Clinical evaluation and treatment of pharyngitis

Additional to a sore throat, symptoms of strep throat include headache, fever, chills and, in some cases, abdominal pain, nausea and vomiting.[6] Distinguishing the clinical features of viral and bacterial pharyngitis is challenging due to similarities in presentation.[7] Diagnosis of strep throat is often complicated due to the substantial overlap of symptoms across different aetiologies.[6] This necessitates more in-depth diagnostic tests in addition to physical examination of the patient. There are five types of diagnostic tests that are routinely used to confirm the presence of GABHS infection, namely clinical scoring systems, throat culture, rapid antigen detection tests (RADTs), nucleic acid amplification tests (NAATs), and machine learning and artificial intelligence (AI) (Table I).[8]

Numerous clinical scoring systems have been designed and implemented, the most popular being the Centor criteria and McIsaac scoring system, but there is uncertainty regarding the ability of these systems to provide an adequate basis for GABHS diagnosis.[8] As such, clinical scoring systems are often used to inform the appropriateness of implementing other diagnostic tests, such as RADTs, NAATs or throat cultures, which offer increased diagnostic accuracy and are able to distinguish between viral and bacterial aetiologies of pharyngitis.[9,10]

Complications associated with GABHS are divided into suppurative and non-suppurative complications. Suppurative complications are caused by the involvement of structures near the area of infection, or the spread of the infection to drainage areas.[16] These suppurative complications include sinusitis, otitis media, peritonsillar abscess, cellulitis, necrotising fasciitis, and meningitis.[16] On the other hand, non-suppurative complications include glomerulonephritis, acute rheumatic fever, and reactive arthritis.[16]

Strep throat is self-limiting, and often resolves within 10–14 days without the use of any therapeutic interventions.[17] Available treatment strategies aim to provide symptomatic relief, shorten duration of the disease, reduce the risk of transmission, prevent non-suppurative and suppurative complications, and reduce the use of antibiotics.[18]

Symptomatic relief is achieved through analgesics and antipyretic drugs such as paracetamol and ibuprofen.[19] Oral corticosteroids can be used to facilitate healing and reduce pain in patients with a sore throat.[20] Various randomised clinical trials in the

Table I: Different methods used in the diagnosis of strep throat

Diagnostic method	Principle	Comments
Clinical scoring systems[10]	These scoring tools use algorithms that integrate information from different variables to assess the likeliness of GABHS infection.	Since these tools do not require specialised equipment or tests, they are easy to implement by healthcare providers to complement further diagnostic tests.
Rapid antigen detection tests[11]	Following a throat swab, the presence of GABHS-specific cell wall antigen (Lancefield group A carbohydrate) is ascertained through an immunological reaction.	Although substantial variation in the specificity and sensitivity of RADTs has been reported, these tests are still useful clinical tools in the detection of GABHS. This is attributed to their low cost, ease of use and speed of delivering results.
Throat culture[12]	A nasopharyngeal swab is taken and cultured. Assessment of colony morphology, Gram staining and serogrouping are used to identify GABHS.	Considered to be the gold standard for diagnosing GABHS, throat culture displays high sensitivity and specificity and is relatively cheap. Its main disadvantage is that test results are only obtained after 24 to 48 hours, delaying diagnosis and treatment.
Nucleic acid amplification tests[13]	Nucleic acid sequences specific to GABHS are probed for, amplified, and detected. Various amplification techniques exist, including isothermal and polymerase chain reaction techniques.	NAATs possess higher sensitivity than RADTs, but the excessive cost thereof prohibits the extensive use of NAATs in the clinical setting.
Machine learning and artificial intelligence[14,15]	Image capture and processing algorithms may be employed to diagnose GABHS infection from pictures of patients' throats. The automation of examining throat cultures is made possible by artificial intelligence algorithms.	These techniques may provide improved diagnostic accuracy and decrease clinicians' workload, but further validation studies are needed before they can be implemented.

treatment of patients aged 5 or older, with clinical signs of acute tonsillitis, pharyngitis and sore throat have demonstrated that corticosteroids such as dexamethasone (maximum dose: 10 mg) provide pain relief without an increase in serious adverse events.[20] Lozenges, anti-inflammatory gargles, and local anaesthetics can additionally be used for symptomatic relief.[21]

Antibiotics may reduce the development of suppurative and non-suppurative complications of GABHS. The rate of the transmission of GABHS is 35%,[22] and antibiotics may reduce the communicability to 24 hours, which limits the spread to high-risk patients.[18] In achieving these goals, the benefit of antibiotic use must outweigh the associated costs. In medical settings, there is an overprescription of antibiotics for the treatment of pharyngitis. For example, a 2015 study in Egypt reported that antibiotics were prescribed in 86% of patients with pharyngitis.[23] Irrational prescribing of antibiotics in patients with pharyngitis results in wasteful expenditure.[18] The unnecessary use of antibiotics can lead to the development of side effects such as diarrhoea and allergies.[18] Moreover, the irrational use of antibiotics in the treatment of GABHS has contributed to resistance to broad-spectrum macrolides and fluoroquinolones.[24] As such, patients unlikely to benefit from antibiotic treatment are advised to seek medical help if there is no remission of symptoms after one week, or when the symptoms worsen.[21]

Antibiotics with narrow spectrums are recommended for the treatment of GABHS, with penicillin V being the antibiotic of choice of many physicians.[18] In South Africa, the standard treatment guidelines and the essential medicines list recommend 500 mg penicillin V, two to three times a day for 10 days in adults and adolescents weighing more than 30 kg as first-line treatment for patients with GABHS.[21] Relatively low costs, fewer side effects and a narrow spectrum of activity render penicillin the favourable drug of choice when treating GABHS. Additionally, penicillin is useful in the reduction of the incidence of rheumatic fever in patients with strep throat infection.[25] Although there are conflicting opinions on the efficacy and safety of using a shorter course of penicillin, a recent systematic review and meta-analysis of 50 clinical trials suggested that long-term penicillin V treatment should remain the first-line therapy in patients with a GAHBS infection.[26] Some cephalosporins can be used as an alternative to penicillin therapy. For example, cefprozil has been demonstrated to have higher eradication rates of GAHBS compared to erythromycin.[27] Furthermore, despite significant in vitro efficacy of penicillin, studies have reported the inability to eradicate GAHBS in 35% of patients with pharyngitis.[28] In contrast, a once-daily dose of cefprozil has the ability to eradicate the streptococcal carrier state.[28]

Allergies and intolerance can limit the use of penicillin in some individuals. In such cases, the National Institute for Health and Care Excellence recommends a dose ranging from 250 mg to 500 mg of clarithromycin twice daily for 5 days as alternative first-line therapy.[29] In patients with resistance to macrolides, a 7 mg/kg dose of clindamycin can be administered three times daily.[21] The disease is usually no longer contagious after 24 hours of antibiotic treatment, and individuals may return to school or work after this time period. Follow-up visits are not usually required following treatment.[25]

Tonsilitis

Closely related to pharyngitis, tonsilitis is the inflammation of the tonsils – the lymph nodes found on the lateral oropharynx, and makes up about 1.3% of outpatient visits.[30] Similar to pharyngitis,

tonsilitis can be caused by virus or bacteria, however viral aetiologies are more common.[30] The GABHS pathogen is commonly responsible for bacterial tonsilitis, however, *Staphylococcus aureus*, *Streptococcus pneumoniae, Mycobacterium tuberculosis*, and *Haemophilus influenza* have also been implicated.[31] Common viral causes include the pathogens that cause the common cold (rhinovirus, adenovirus, and coronavirus).[32] Other viral causes of tonsilitis include HIV, Epstein-Barr, cytomegalovirus, and Hepatitis A.[32] In sexually active adults, various sexually transmitted infections should be considered as a probable cause.[33] Although rare, complications associated with tonsillitis include glomerulonephritis, scarlet, and rheumatic fever.[30]

Clinical evaluation and treatment of tonsilitis

Evaluation of tonsillitis involves physical examination, stratification of patents according to the Centor score, and evaluation of the need for collection of samples for antigen testing/throat culture.[34] Imaging is not often required, however, in complicated cases where there are unstable vital signs, difficulty swallowing, and toxic appearance, more investigations may be required.[35] These investigations include computerised tomography imaging and further laboratory tests on blood samples.[30]

Owing to the common viral aetiology of tonsilitis, supportive care involving adequate hydration and analgesics, with corticosteroids often used as an adjunct therapy, is sufficient for treatment.[36] In cases of bacterial tonsilitis, and when antibiotic therapy is needed, a similar treatment strategy for the treatment of GABHS pharyngitis is followed.[28] When tonsilitis is recurrent, partial or complete tonsillotomy or tonsillectomy, respectively, can be used as treatment strategies. Careful consideration and adherence criteria for surgical management decision making should be conducted prior to surgical intervention.[37]

Conclusion

Pharyngitis and tonsilitis are commonly encountered in various outpatient settings. Although these conditions are self-limiting and resolve without the need for hospitalisations, they sometimes lead to complications that put patients' health at risk. As such, careful evaluation should be conducted when deciding whether to use antibiotics as therapy. This evaluation will prevent the irrational prescribing of antibiotics, which ultimately contributes to antibiotic resistance, a current threat to human health around the world.

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A review of asthma management in adult patients

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Abstract

Asthma is a chronic inflammatory condition characterised by intermittent episodes of wheezing, coughing, chest tightness, dyspnoea and variable airflow limitation, and airway hyper-responsiveness. Asthma severity varies uniquely between individuals and may change over time. Identifying asthma severity is integral to asthma management and linking appropriate treatment to establish asthma control. Asthma management is based on a step-wise approach on severity of patient presentation and includes bronchodilators, inhaled corticosteroids and mast cell stabilisers. This article provides an overview of the diagnosis, characterisation and treatment of asthma.

Keywords: asthma, inhaled corticosteroids, beta-adrenergic agonist, step-wise approach

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Introduction

Asthma is an inflammatory disease of the airways, which has already been recognised and recorded by ancient Greek physicians.[1] In 1032, editor Robert Cooke changed the idea that asthma is fundamentally the expression of an allergic reaction. In the early 1960s, asthma was thought to be a disease of smooth muscle, whereas, in the 1980s, the focus of asthma returned to inflammation.[1] Currently, the link between asthma and inflammation is clear; however, recently, the focus has been on the heterogeneity of the disease and the impact of the various inflammatory pathways and their role in asthma phenotypes.[1] Asthma is described as a heterogeneous disease, marked by chronic airway inflammation, with a substantial global disease burden of disability.[2] Globally, it is considered one of the most common chronic diseases, characterised by bronchial hyper-responsiveness and reversible airflow limitation or obstruction. Phenotypically, asthma can be classified into allergic, non-allergic, paediatric, late-onset, obesity, occupational, severe asthma, as well as asthma with fixed airflow obstruction and asthma in the elderly.[3,4] According to The Global Asthma Report, asthma is estimated to affect 262 million people worldwide, with around 1 000 people per day dying from asthma exacerbations.[5] The Global Initiative for Asthma (GINA) emphasises goals to achieve and maintain control of the symptoms, maintain pulmonary function as close to normal, and prevent exacerbations and mortality in the effective management of asthma.[6] The Global Asthma Report recommends that the World Health Organization (WHO) develop a global asthma control strategy to emphasise the need for asthma to be managed as a chronic disease rather than acute episodes or attacks. The report urged governments to ensure all people with asthma can access and afford essential asthma medicines and care.[5] Furthermore, policies to reduce tobacco consumption, encourage healthy eating and reduce exposure to potentially harmful chemicals, smoke and dust need to be strengthened. Between a third and a half of children, adolescents and adults with asthma symptoms have severe symptoms that regularly interfere with everyday life.

Despite a marked decline in asthma-related deaths between 2001–2005 and 2011–2015, South Africa ranks third out of 28 low-and-middle-income countries (LMICs) for asthma-related mortality.[5] This is due to inadequate implementation of guidelines advising on asthma management.[7] Shortcomings may be attributed to challenges within the healthcare system, along with behaviours of healthcare providers, patients and/or caregivers. Urbanisation, obesity, respiratory infections, such as tuberculosis and pneumonia (and more recently SARS-CoV-2), and environmental pollutants, can be considered additional factors precipitating the high asthma prevalence in South Africa. This may suggest a need to look into appropriate diagnosis, treatment and access to care.[8,9] Both airway inflammation and airway remodelling are pathologies that must be considered.[10] Features of airway remodelling include mucus hypersecretion, subepithelial fibrosis, smooth muscle hypertrophy and angiogenesis, which result in a degree of airway limitation/constriction, leading to obstruction of airflow and ultimately to limited lung function.

Figure 1 is a diagrammatical overview of the pathophysiology.

Signs and symptoms of acute and chronic asthma

Asthma exacerbation, referred to as acute asthma, is defined as an episodic asthma attack that progresses rapidly. Early recognition is of utmost importance in order to administer rescue medication timeously. Exposure to triggers like allergens and tobacco smoke is a major factor influencing asthma control.[2,11] Symptoms of an acute asthma attack include severe dyspnoea, tightness in the

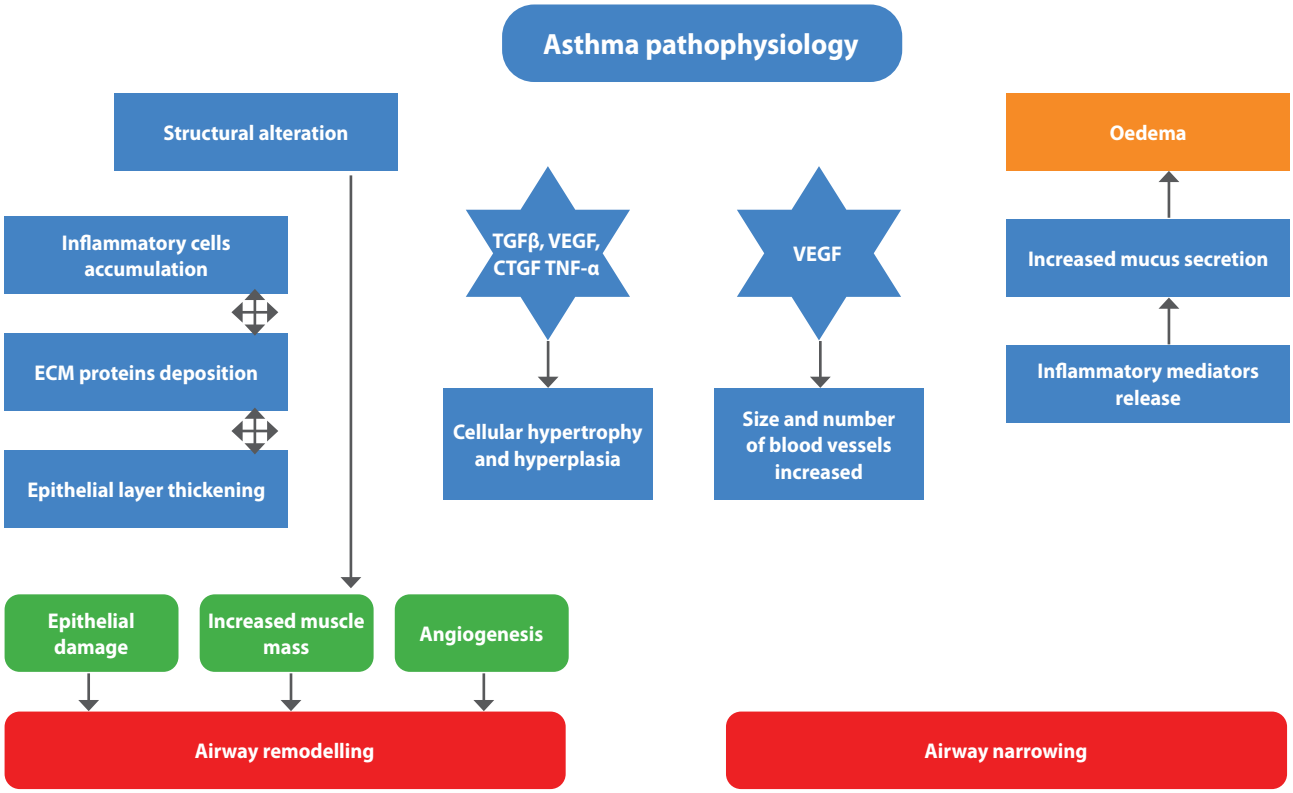

Figure 1: Pathology of asthma

chest, severe shortness of breath and acute respiratory distress, often leading to anxiety, which will magnify the symptoms. On physical examination, the patient presents with tachycardia, tachypnoea, expiratory and inspiratory wheezing, cyanotic or pale skin, hyper-inflated chest and dry hacking cough.[2,11]

Chronic asthma is a life-long condition that varies in nature from daily to intermittent symptoms. Signs and symptoms may be triggered during exercise, or when exposed to an allergen. Continuous lifelong treatment and management of inflammation are essential. The signs and symptoms of chronic asthma include a dry hacking cough, expiratory wheezing and sometimes, allergic rhinitis or eczema. These may be triggered during exercise or exposure to allergens. Chronic asthma episodes also include nocturnal cough, chest tightness and wheezing or.[11]

Identifying precipitating triggers may assist in adequately controlling and preventing acute asthma attacks, and can reduce disease progression into chronic asthma. Table I provides an overview and classification of some precipitating factors.

Classification of severity of asthma

Classifying the severity or degree of the asthma exacerbation is important before implementing treatment. The management of the condition should be reviewed periodically, and determining the severity of asthma plays an important role in establishing adequate control of the condition. The diagnosis of asthma is based on identifying a characteristic pattern of respiratory symptoms and variable expiratory airflow obstruction.[6]

Table I: Triggers of asthma exacerbations

Category	Triggers
Viral respiratory infections	• Rhinovirus (particularly subtypes A and C) • Respiratory syncytial virus (most frequent in infants and young children) • Least frequent: parainfluenza virus, coronavirus, adenovirus and influenza viruses
Environmental factors	• Air pollution/irritants: ozone, sulphur dioxide, tobacco smoke (prenatal exposure also implicated), motor vehicle emissions, particulate matter, strong fumes (including cosmetics/aerosol sprays) • Allergens: airborne pollen, animal fur, fungal spores, house-dust mites and cockroaches, mould and damp • Weather changes
Occupational factors	• Industrial inhalants and irritants: hay, mould, Arabic gum, spices, flour dust and chemicals (azo-dyes, polyvinyl chloride, formaldehyde, ethylenediamine, anhydrides, etc.)
Food additives and nutritional factors	• Preservatives: sulphites, benzalkonium chloride • Metabisulfites: in wine, beer and dried fruit • Vitamin D insufficiency in children
Medication	• Cyclooxygenase (COX) inhibitors: aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) • Paracetamol • Non-selective β-blockers
Lifestyle factors	• Obesity • Exercise in a cold, dry climate
Psychological factors	• Stress, anxiety, depression
Gastrointestinal factors	• Gastro-oesophageal reflux disease

Consider the following aspects:

- Based on patient history and physical examination: Determine if symptoms of recurrent airway obstruction are present:
- History of cough, recurrent wheezing, recurrent difficulty in breathing, recurrent chest tightness
- Symptoms occur or worsen at night or with exercise, viral infection, exposure to allergens and irritants, changes in weather, hard laughing or crying, stress or other factors
- Spirometry is recommended in all patients > 5 years of age to determine whether airway obstruction is partially reversible.
- Consider other causes of obstruction.

The four categories for determining the severity of asthma include classification into two groups (mild intermittent and chronic persistent) based on presentation and symptoms. The categories can be classified as category I–IV, based on the presentation of day- and night-time symptoms and peak expiratory flow. Daytime symptoms refer to any cough, wheeze and chest tightness and are classified into mild, moderate or severe asthma depending on the frequency of occurrence per week. Night-time symptoms include any cough, wheeze, tight chest and nocturnal wakening.[12] The peak expiratory flow drops below 60% in severe asthma, whereas it should be 80% or above in mild to moderate asthma.

Diagnosis

To clinically diagnose asthma, objective airflow measurement is required. A patient with recurrent respiratory symptoms of wheezing, coughing, shortness of breath and chest tightness should be assessed for bronchial hyperresponsiveness. A bronchial challenge test (bronchodilator responsiveness) can be used to positively diagnose asthma.[13] Any alternative diagnosis should be excluded.[14] Step-by-step procedures can be followed to diagnose and then treat asthma.[13] The spirometer is used for an objective lung function test called spirometry and can be used to confirm airway obstruction. By adding a bronchodilator (short-acting β2-agonist), reversibility of obstruction can be demonstrated, if present.[14] The spirometry test measures the forced expiratory volume in 1 second (FEV1) and the forced vital capacity (FVC, the maximum volume of air that can be exhaled). The ratio of FEV1/FVC can then be calculated. The patient is told to breathe in the largest breath possible and to seal the lips around the mouthpiece of the spirometer. The patient must then blow the air out as fully and as rapidly as possible. The FEV1/FVC ratio in a normal adult population is usually greater than 0.80. Airflow obstruction is diagnosed in values of less than 0.80. An FEV1/FVC ratio of less than 0.70, following the administration of a bronchodilator, indicates airway obstruction associated with chronic obstructive pulmonary disease (COPD).[14] If the spirometry results are non-diagnostic for a patient that has a normal FEV1/FVC ratio, but asthma is still suspected considering the patient's signs and symptoms, further objective tests are available to confirm the presence of this condition, for instance, promoting peak flow monitoring by using a measuring device called a peak flow meter. Peak flow monitoring measures the fastest expired flow rate. The patient should be advised to take the deepest possible breath and then to blow it out as fast and hard as possible into the peak flow meter.

The normal values of peak expiratory flow (PEF) for men aged 15–85 years, with height measurements of between 160 and 190 cm, is 420–670 ml/min, and for women aged 15–85 years, with height measurements between 152 and 183 cm, 310–470 ml/min.[15]

The two parameters supporting the diagnosis and confirmation of asthma using the peak flow meter are as follows: periodic variation in peak expiratory flow of more than 20% (or, with twice-daily readings of more than 10% at each reading), and an improvement of at least 60 ml/min or at least 20% after inhalation of a rapid-acting bronchodilator.[13]

The management approach to asthma

Effective asthma management involves the ability to step up the treatment when asthma control is not achieved, or to step down once good asthma control is established. Therefore, patients should be reviewed frequently until the desired level of control is achieved.[15] Pharmacological and non-pharmacological treatments are adjusted in a continuous cycle that involves assessment, treatment and review.

Non-pharmacological interventions include:[6]

- Cessation of smoking
- Physical activity and weight reduction in obese patients
- Avoidance of occupational exposures and allergens
- Avoidance of medications that make asthma worse (NSAIDs and aspirin)
- Healthy diet
- Dealing with emotional stress

When symptoms are consistent with asthma and other conditions ruled out:

- Administer short-acting β2-agonist as needed to relieve symptoms
- Start anti-inflammatory therapy (e.g. a low-dose inhaled corticosteroid)
- Consider allergy testing to eliminate triggers, and treat appropriately
- Spirometry before and after an inhaled, rapid-acting bronchodilator:
  Preferred option; high level of accuracy
  FVC, FEV1 and the FEV1/FVC ratios

When spirometry measurements are normal:

- Consider an alternative diagnosis, and/or
- Peak flow monitoring, and/or
- Bronchial hyper-responsiveness testing

Introduction of treatment (only for those patients with a high likelihood of asthma or confirmed asthma diagnosis).

Re-evaluate the diagnosis, control and treatment at a follow-up visit

This can further be classified (Table IV) as controlled, partly controlled or uncontrolled asthma for a given week. The patient can be assessed for adherence and the level of asthma control. Complete asthma control is possible and should be achieved with minimal side effects.[15]

Poor asthma control presents with the following factors and should be assessed for re-evaluation of asthma treatment:[6,13]

- Use of β2-agonists three or more times a week
- Sporadic symptoms three or more times a week, or
- Nocturnal awakening one night per week due to symptoms.

Factors that can be re-assessed with the patient to achieve asthma control are:[15]

- Assess reasons for poor adherence
- Clarify misunderstandings in terms of the difference between relievers and controllers
- Check the inhaler technique

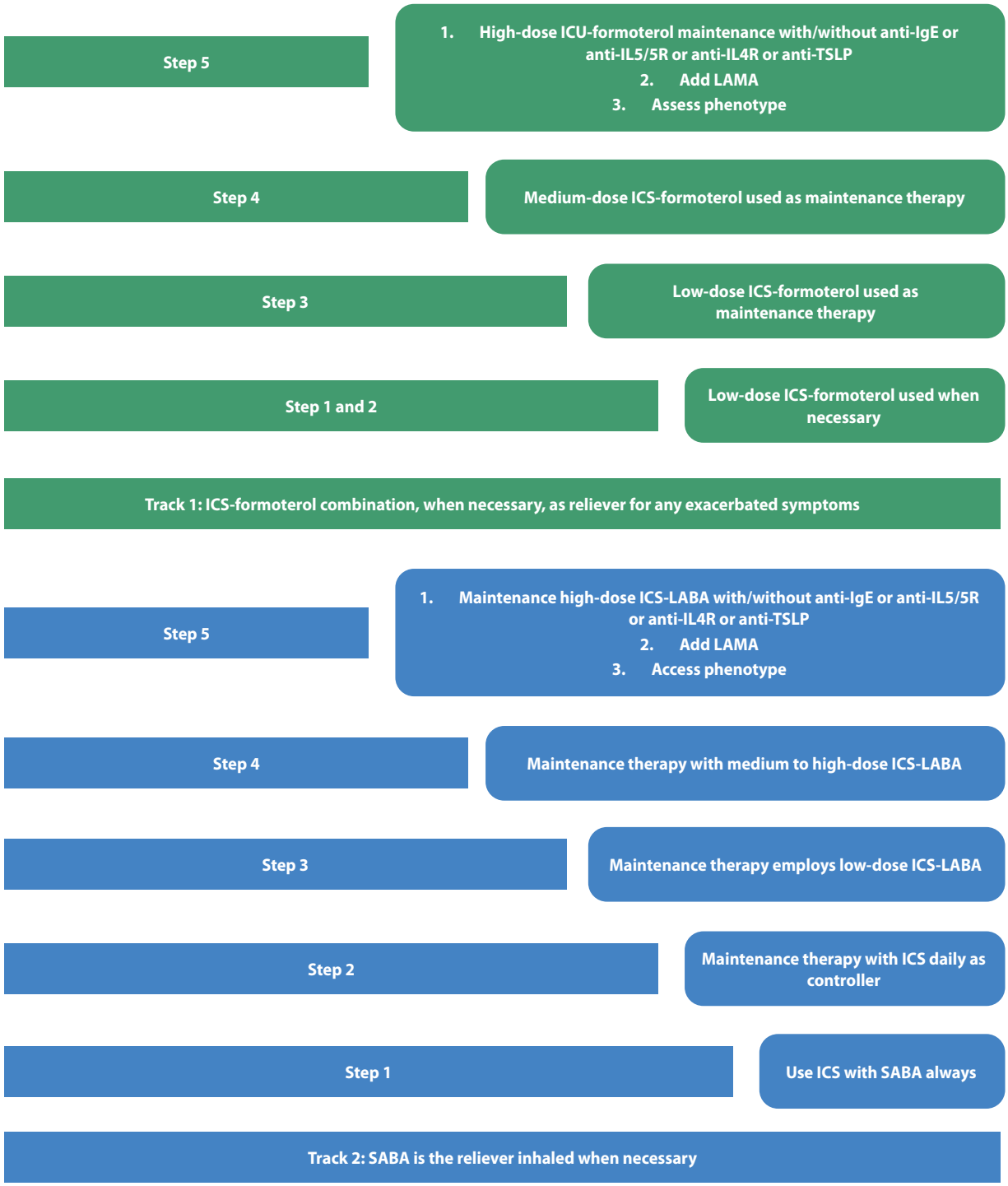

Figure 2: Two track treatment approach[6]

- Identify exposure to trigger factors at home or work
- Check for the presence of gastro-oesophageal (acid) reflux disease
- Assess for rhinitis and sinusitis
- Identify other medications that may aggravate asthma, such as aspirin, NSAIDs and beta-blockers
- Identify other medical conditions, such as COPD, that may aggravate asthma

Step-wise approach

The current GINA treatment guidelines recommend therapy in two formats, denoted as Tracks. The rationale for having two track systems in place is to escalate and de-escalate therapy. The current GINA guidelines recommend Track 1 as the preferential treatment option, which is predicated on a low-dose inhaled corticosteroid (ICS)-formoterol combination as the reliever. Current research shows a substantial decrease in hospitalisations and exacerbations compared to the Track 2 strategy, with similar symptom control and lung function. Track 2 is predicated on short-acting beta-agonists (SABA) as its reliever. Current GINA guidelines recommend the application of Track 2 strategies for low- to middle-income communities as Track 1 imposes higher costs and is not as readily available in LMICs.[6]

Bronchodilators

Bronchial smooth muscle contains both muscarinic and β2 adrenergic receptors. Stimulation of these receptors by β2 adrenergic agonist medication will facilitate bronchial smooth muscle relaxation and bronchodilation. Two possible mechanisms of medication action include active and passive bronchodilation.[16]

The selective β2-receptor agonists are selective agonists at the adrenergic β2-receptors (also referred to as the β2-adrenoceptors) of the bronchial smooth muscle when inhaled directly into their biophase, causing a localised effect in the smooth muscle of the lower respiratory tract. Intravenous or oral administration will cause a loss of selectivity, which will produce cardiac (β1-receptor) effects. Examples of short-acting agents (SABA) are salbutamol (albuterol), fenoterol, hexoprenaline and terbutaline. These medication act as active bronchodilators by increasing the concentration of cAMP, acting as physiological antagonists of spasmogens causing bronchoconstriction. Side effects of SABA include tachycardia, palpitations, skeletal muscle tremors and increased arterial blood pressure. In contrast to the short-acting β2-agonists, which have an average onset of action of approximately half an hour (or less), and a duration of action in the range of four to six hours, the long-acting β2-agonists (LABA) will have a slower onset and more sustained duration of action, lasting up to 12 hours. Examples of LABAs include salmeterol, formoterol and vilanterol (newly available in South Africa [SA] arformoterol and indacaterol).[16,17]

Fixed-combination inhalers are also available in SA, ensuring that a LABA is combined with an ICS due to decreased asthma-related mortality in LABA monotherapy. Examples include fluticasone/salmeterol and budesonide/formoterol. Newer ICS/LABA combination inhalers include fluticasone furoate/vilanterol.[17]

The short-acting **anti-muscarinic** medicine of choice is ipratropium bromide, as it is a quaternary ammonium derivative of atropine which does not cause thickening of the bronchial secretions. Blocking the muscarinic receptors will inhibit acetylcholine-induced bronchoconstriction, and implies that adrenergic stimulation of β2-adrenoceptors in the bronchial smooth muscle will not be opposed by parasympathetic outflow from the vagus nerves. This results in bronchodilation. Therefore, ipratropium bromide is a passive bronchodilator. Tiotropium bromide is a long-acting muscarinic antagonist (LAMA). Both drugs are particularly important in managing COPD, and because they are poorly absorbed following inhalation, they cause very few systemic side effects. Enhanced bronchodilation may be achieved when combining ipratropium bromide with a short-acting, selective β2-agonist, such as salbutamol or fenoterol, due to the synergism between their mechanisms of action.[16]

Disease modifiers

Inhaled glucocorticosteroids, such as budesonide, beclomethasone, ciclesonide and fluticasone, are much safer for long-term use than systemic corticosteroids. They will alter the course of the disease process and are life-preserving in the long run. ICS will not manage acute bronchospasm but will decrease bronchial hyperreactivity and the risk of a relapse. Nasal sprays are also available for the management of allergic rhinitis. In addition to budesonide, beclomethasone and fluticasone, mometasone, and triamcinolone are also available for the latter indication. An important side effect of ICS is oral thrush (i.e. oral candidiasis). Patients should be advised to rinse their mouths with clean water following inhalers to reduce the possibility. These drugs are the main anti-inflammatory agents used in the management of asthma.[16]

The leukotriene receptor antagonists like zafirlukast and montelukast are effective in controlling exercise- and aspirin-induced asthma, and may be used in the chronic treatment of asthma. They are competitive antagonists of the cysLT1-receptor and have the advantage of oral administration; montelukast is even available as a sprinkle and in a chewable tablet form for paediatric use.[16]

Zileuton is a 5-lipoxygenase (5-LOX) inhibitor and therefore acts as a leukotriene synthesis inhibitor. Zileuton has the added advantage of also inhibiting the formation of leukotriene B4 (LTB4).

The **mast cell stabilisers**, such as sodium cromoglycate (also known as cromolyn sodium) and ketotifen, may be used in (allergic) asthma prophylaxis and for the prevention and treatment of allergic rhinitis. These medicine act by stabilising the plasma membranes of mast cells, preventing these cells from degranulation and release of histamine and other spasmogens. The term 'mast cell stabiliser' is actually somewhat limiting because sodium cromoglycate, and the closely related nedocromil sodium,

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- Greater asthma control at a lower ICS dose *vs.* larger particle ICS/LABA combinations*[4,5]

*_vs._ budesonide/formoterol (Dry Powder Inhaler) and _vs._ fluticasone propionate/salmeterol (pressurised metered dose inhaler and Dry Powder Inhaler)[5]
ICS – inhaled corticosteroid; LABA – long-acting beta$_2$-agonist, GINA - Global Initiative for Asthma

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S4 INNUVAIR® Inhaler. Each metered dose contains beclomethasone dipropionate 100 µg; formoterol fumarate dihydrate 6 µg. Reg. No. 42/21.5.1/0895. For full prescribing information refer to the package insert approved by the medicines regulatory authority. 2022031410190240. March 2022.

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have effects on many other cells that form part of the inflammatory response as well, and ketotifen also acts as an antagonist at H1-receptors.[16]

The novel monoclonal antibody, omalizumab, is an **immunoglobulin E (IgE) antagonist** that is administered subcutaneously once or twice per month. However, as a protein-therapeutic agent, it may elicit allergic reactions (or even anaphylaxis).

Conclusion

Asthma is defined as an inflammatory condition of reversible airflow obstruction, and it can be effectively managed with the right treatment. Timeous diagnosis and classification of the severity of the disease are essential for effective treatment and disease modification. A step-wise approach to treatment with increasing dosages of ICSs according to the patient's response to treatment is recommended. Patients who are resistant to treatment should be referred to a respiratory specialist.

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A day in the life of an allergist: thinking outside the box

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Abstract

Allergology is so much more than 'itchy noses'. It is a broad sub-specialty which encompasses immunological 'mishaps' in many organ systems. Part of the art of allergology is sorting out the 'normal' from the 'allergic' from the 'alternative diagnoses'. The allergist needs to be able to see through common misperceptions, arrange appropriate tests for the patient in a targeted rather than a generic way, and recognise patterns of symptoms which can lead to the diagnosis. The allergist then needs to gently guide the patient into accepting the real diagnosis, and set out management plans for the long term as well as for acute exacerbations and emergencies. It is one of the few sub-specialties that deals with the whole patient rather than homing in on a specific organ system. The variety is stimulating and challenging, as demonstrated by a series of cases in the 'day in the life of an allergist'.

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Introduction

When people ask me about the specialty of allergology, I often comment that I spend as much time 'disproving' allergies as I do 'confirming' them. Patients (and doctors) like to put a name to things, and the term 'allergies' is a common justification used to explain a wide variety of presentations. One of the important skills in allergology is to recognise allergies but also to think laterally and recognise alternative diagnoses, even in someone who has been labelled 'allergic'.[1]

In this part of the series, 'a day in the life of the allergist', I have taken the liberty of condensing some of the interesting cases which I have seen in the past eight weeks (January–February 2021) into a 'day'. Two themes have come to the fore: management strategies in chronic itch/urticaria and conditions simulating asthma.

Part I: Of itching and urticaria…

Case 1

A 21-year-old university student came to see me for the third time in three months. He had been diagnosed with cholinergic urticaria (CU) – a sub-type of the chronic inducible urticarias – brought on by a rise in body temperature or sweating. He had, for the preceding six months, experienced recurrent episodes of a sudden onset of small, intensely itchy hives, whenever he started any form of exercise (even walking up a flight of stairs) and when he became upset/angry ('emotional'). This had become rather troubling as he was not able to participate in any form of physical activity, was unable to take a warm shower and felt awful whenever he became upset, anxious or irritated. Since he had started consulting me three months previously, we had tried a combination of high-dose rupatadine (20 mg twice daily) with montelukast 10 mg daily and ketotifen 2 mg at night.[2] He had tried a variety of other antihistamines, up to four times the recommended daily dose, without significant effect.

Today we needed to try something different. He was reluctant to start omalizumab because of financial and time constraints.

Our next port of call was propranolol, a beta-blocker. We started at 20 mg twice daily and moved up to 40 mg twice daily.[3] We continued the rupatadine and montelukast. When we had to review his blood pressure and pulse two weeks later, he arrived with a gleeful grin, reporting a significant improvement in the symptoms. He had even had a pillow fight with his flatmate and had not developed hives or itching! *And* he tolerated a warm shower afterwards! This had not happened for a while.

Comment: One theory of the pathogenesis of CU is that increased sympathetic tone stimulates the post-ganglionic cholinergic fibres,

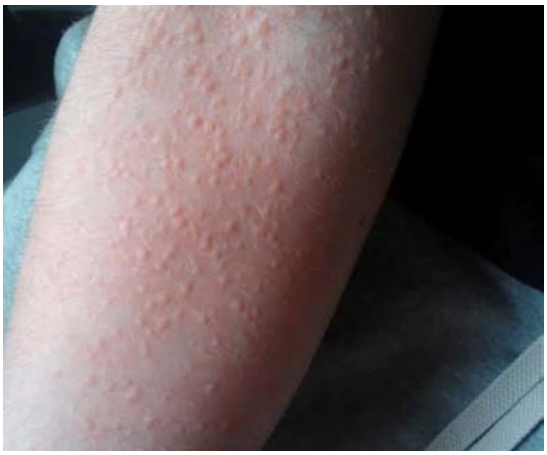

Figure 1: Photograph depicting the typical small hives of cholinergic urticaria

leading to mast cell granulation. In such cases, a beta-blocker may be a very useful addition to antihistamines and antileukotrienes.

Case 2

Hot on the heels of the 21-year-old patient with chronic urticaria was a 12-year-old girl with a six-month history of recurrent, severe urticaria and angioedema when showering, swimming and exercising. She was completely disheartened as her dream was to play waterpolo for her school – an impossible activity, given her urticaria. During the COVID-19 lockdown we had done some telephonic consultations and also prescribed regular high-dose rupatadine, and montelukast, with cetirizine in between as needed. This was barely working, and in considering alternative strategies, I thought about the successful use of propranolol in the previous patient. But this girl was more complicated in her medical history – she had coeliac disease as well as Type 1 diabetes, so I did not wish to interfere with her sympathetic nervous system, which could blunt responses to blood-glucose irregularities.

We talked about omalizumab. Omalizumab has now become the licensed second-line agent in the chronic spontaneous or inducible urticarias which fail to respond to high-dose antihistamines.[4] Both the parents and the patient were keen to try it, as her quality of life had deteriorated significantly with the recurrent itching and rashes. We talked about the complexities of attaining medical insurance cover for the omalizumab. However, in view of the severity of her symptoms and the urgency to try a new treatment, the parents opted to pay for the omalizumab privately. This sped up the process significantly, as we were able to set up an omalizumab injection for later that week. We opted for 150 mg in view of her young age.

For three weeks after the injection she experienced a significant improvement in urticaria and itching. She attended swimming lessons and was able to make it through the practice session without breaking out in hives. She could shower and wash her hair. The occasional hive was managed with a dose of cetirizine. In week 4 post injection, the symptoms started to recur. At the next injection, four weeks after the initial one, we discussed the initially impressive effect but then the waning efficacy in the past week and decided to try a 300 mg dose instead of 150 mg. Doubling the dose of omalizumab has not been found to have any significant side effects, but may well improve the efficacy or longevity of action. The outcome of the increased dose remains to be seen at the time of writing this article.

Comment: Omalizumab has worked its way up the chronic urticaria ladder and is now a second-line agent, after high-dose antihistamines. It can be highly effective. The dosage and dosing interval may need to be adjusted according to symptom-relief patterns and side effect profile.[5]

Case 3

A 48-year-old man with a ten-year history of intermittent discoid eczema presented with an eight-month history of acutely itchy skin, worsened by expose to sun, alcohol and hot showers. He also experienced dermatographism. Apart from eczema lesions on his trunk, the itch on the rest of the body was not associated with any particular lesions or rashes; just an intensely debilitating itch. He was concerned about a possible drug reaction to thyroid-replacement medications, but had not experienced significant improvement on stopping the medications temporarily. A previous full blood count, renal function tests and liver functions were normal. We ordered a baseline tryptase level, which was normal.

I generally realise that when middle-aged or elderly adults come into a paediatric allergy centre, they have come to the 'end of the road', desperate for answers, after having seen numerous family doctors and specialists! My first inclination was to manage this gentleman as a chronic spontaneous urticaria (CSU) case in addition to his longstanding eczema, hence I started him on fexofenadine 180 mg twice daily and montelukast 10 mg daily, as well as topical treatment for the eczema patches. On review two weeks later, he reported that the initial response to an antihistamine treatment had been pleasing, but that after a week his generalised skin itching was again severe and debilitating, especially at night. I was not comfortable with this atypical response to treatment, therefore I decided to repeat some blood tests.

We repeated his blood count and found a raised haemoglobin of 17.8 g/dL (normal range 13.5–17.5 g/dL). We therefore added on iron studies and were surprised to find a markedly raised ferritin level of 410 ng/ml (normal range 20–250 ng/ml).

I called for the assistance of a helpful haematologist, whose detailed work-up ruled out malignancies and found the patient to be a carrier for haemochromatosis. In view of the high ferritin, he underwent serial venesection.

It is with delight that I heard the feedback that once the ferritin

was down to normal, the itch settled almost completely.[6]

Comment: Atypical itching/urticaria should prompt consideration of an alternative diagnosis: uraemia, cholestasis, polycythaemia, hyper-ferritinaemia and haemochromatosis can all lead to itching.[6] Approximately 30% of patients with Hodgkin's disease feel significantly itchy.

Learning points

- Chronic itch and urticaria can have a variety of underlying causes.
- Typical CSU which does not respond to high-dose anti-histamines may require a trial of beta-blockers (especially in CU) or omalizumab.
- If the urticaria/itch is not typical, then think laterally and consider systemic causes.

Part II: Shortness of breath: not only asthma…

Case 1

A ten-year-old boy came to our allergy centre with his father during the latter part of the second wave of the COVID-19

pandemic. He was a longstanding asthma patient of mine, but had outgrown his asthma symptoms by the age of six years and had been comfortably off controller therapy for four years. There was a concern about the return of asthma. Of late, when he walked up stairs or ran while playing in the garden, he became very short of breath. I questioned further: there was no audible wheeze and no cough. The sensation of dyspnoea was mainly on inspiration. The boy examined well with a clear chest and a normal age-and-height-related peak flow. However, he had noticeably gained a significant amount of weight since his last visit – his weight of 47 kg lay on the 98th centile, whereas his height of 138 cm was average for age. On prompting, he admitted to having been very sedentary during the lockdown; the entire year had been sports-free at school, and the quality of his diet had slipped into luxury-dominance. Of the many indirect consequences of COVID-19, lockdown-related inactivity and an increase in obesity have been visibly common.[7]

In this case, the shortness of breath was ascribable to obesity and deconditioning (being 'unfit'). There were no signs of asthma. We counselled the family on healthy diet and exercise habits, and the importance of staying in shape for one's general health.

Comment: A lack of exercise and obesity can contribute to shortness of breath, especially on exertion, which can be confused with asthma. In addition, obesity can worsen pre-existing asthma.[8] When assessing patients for chest issues, their nutrition and body mass index (BMI) should be taken into consideration.

Case 2

A 12-year-old girl came in for an assessment for asthma. She was fit and well, with no underlying atopy. During the preceding three months, she had started making some strange noises when breathing, which the parents thought were possibly due to asthma. On further questioning, the strange breathing did not worsen from exercise or extremes of emotion and there was no associated cough. The strange breathing occurred only during the day, even when distracted and resting, and disappeared at night.

Examination showed the chest was totally normal and aeroallergen tests were negative. During the consultation, she had three episodes of the unusual breathing pattern, in which she took a deep sighing inspiration, similar to a yawn. Oxygen saturation was normal; ears, nose and throat (ENT) examination was normal, and a chest X-ray was normal with no constriction or swelling around the upper airway.

A diagnosis of *sighing dyspnoea* (or 'sigh syndrome') was made. Sighing dyspnoea is an uncomfortable sensation of feeling unable to take a deep, satisfying breath during normal breathing, leading to recurrent deep sighing or yawning-type breathing.[9] The inspiration can be quite exaggerated and staccato-style, leading to a concern about breathing difficulties. It is more common in females. Conversation remains normal, and episodes tend to occur more when the patient is alone or at rest. Sighing dyspnoea tends to occur in 'blocks' lasting days to weeks and can be helped by 'slow breathing' exercises. It is an entirely benign and transient condition, but it can evoke a lot of concern and unnecessary investigation if the physician is not familiar with the syndrome.[10]

Comment: In the past year I have seen four patients with 'sighing dyspnoea'. Many presented with extreme concern about a serious respiratory condition, and I will admit that I over-investigated the first such patient I had. But with pattern-recognition this has become a simple condition to diagnose, and reassurance with breathing exercises (and 'putting a name' to the condition) are usually all that is needed to manage the condition.

Case 3

An 18-month-old boy came in with a one-week history of a worsening cough. He had experienced two prior episodes of viral-induced wheezing, at ten and 12 months of age respectively. The little boy was active and afebrile, but the breathing had become more laboured in the preceding few days. The chest was clear on examination despite tachypnoea (respiratory rate 60) and subcostal recessions; and the oxygen saturation was reduced at 92%. I was concerned about pneumonia but confused regarding the clear chest, and so I proceeded to ask about COVID-19 exposure or any other unusual recent events or exposures. The father informed us that the little boy had eaten a handful of peanuts a week previously, and had suddenly coughed a lot at the time as if choking, hence the parents had taken him to the ER. There he had examined well and had a clear chest X-ray, so he had been given the all-clear.

Against this history, the worry about a foreign-body inhalation escalated, the little boy had an immediate chest X-ray (which showed hyperinflation but no localised consolidation) and was transferred within hours to our willing paediatric pulmonologists. The very next morning he had a bronchoscopy and half a peanut was retrieved from the right main bronchus. He made an uneventful recovery after this.

Comment: In a young child with shortness of breath or a progressive cough which is not explained by a typical bronchiolitis or pneumonia, always ask about the possibility of foreign-body inhalation.[11]

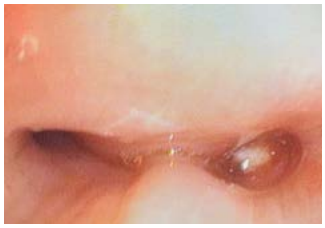

Figure 2a: Peanut visible in right main bronchus on bronchoscopy

Figure 2b: Removal of the peanut bronchoscopically

(These are true photographs of the patient in the case, courtesy of Dr Taryn Gray, Paediatric Pulmonologist, Cape Town)

Conclusion

So many different clusters of symptoms and signs can present to an allergologist. If a referring doctor or the patients and/or caregivers have labelled the patient as 'allergic', do not take it at face value. Listen, examine and investigate appropriately but judiciously. Yes, some will be 'barn door' allergies, but some may require lateral thinking, taking the patient's current age or situation into account and practising astute pattern recognition.

Conflict of interest

The author declares no conflict of interest.

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Conference 2024 – an opportunity to engage with global Hospital Pharmacy

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In February 2023, the SAAHIP National Executive Committee confirmed that there will be no SAAHIP Conference in 2024, as all efforts will be directed towards the International Pharmaceutical Federation (FIP) World Congress of Pharmacy and Pharmaceutical Sciences, to be held in Cape Town from 1–5 September 2024. Early planning for this event has started, with the dates and venues set and the logo confirmed (Figure 1).

Figure 1: FIP World Congress logo for Cape Town 2024

This article seeks to introduce SAAHIP members to the format of FIP congresses and what they can expect when they attend in 2024.

The first FIP Congress in sub-Saharan Africa

FIP has arranged congresses in different venues since it was established in 1912. There was a break during the First World War, with the next congress only held in 1922. The Second World War resulted in another break, from 1939 to 1945. Those early congresses were all held in European cities. However, in recent years, FIP has sought to arrange its annual World Congress of Pharmacy and Pharmaceutical Sciences in a wider variety of settings, in both high-income and middle-income countries.

Although an FIP congress was held in Cairo in 2005, the Cape Town congress will be the first for a sub-Saharan African setting. This provides a unique opportunity for South African pharmacists to engage with their global counterparts.

In addition to the World Congress of Pharmacy and Pharmaceutical Sciences, FIP also arranges a Pharmaceutical Sciences World Congress (PSWC) every three to four years, as well as regional conferences. The last PSWC was held virtually in 2020 and the last regional conferences were held in Ankara, Türkiye (for the European region), and Amman, Jordan (for the Eastern Mediterranean region), in 2019. A Global Conference on Pharmacy and Pharmaceutical Sciences Education was held in Nanjing, China, in 2016.

Barriers to attendance of FIP World Congresses

Especially when they are held in high-income countries, FIP World Congresses are out of reach for many pharmacists, especially those who are employed and not individual business owners. The barriers include the high cost of travel to the congress venue, the high cost of accommodation in the host cities and the relatively high cost of registration as an individual congress attendee. Sometimes there are also visa fees.

For the 2023 World Congress in Brisbane, Australia, the registration fee for a non-member of FIP is Australian $1 300, if paid between 16 June and 1 August 2023. That is just over R16 000 at the current exchange rate. An "early bird" discount fee of A$1 150 is available if payment is made before 15 June, but a higher fee (A$1 450) is due for registrations after 1 August 2023. For FIP individual members, the registration fees range from A$850 to A$1 450. For more details, see https://brisbane2023.fip.org/registration/registration-fees/. Critically, the registration fee covers some social functions (not all), but not accommodation or travel costs. Block bookings are made in a range of hotels, at varying prices, but delegates to the Congress are also free to arrange their own accommodation. The Congress hotel, usually located closest to the venue, is often a more pricey option.

However, members of the member organisation that is hosting the Congress get access to a reduced registration fee, and also have access to country-specific events held in parallel with the World Congress. The registration fee for South Africans attending the Cape Town Congress has yet to be decided.

The shape of FIP

For those who have not been engaged with FIP, the Federation can present a rather opaque and confusing picture. First and foremost, FIP is a federation of member organisations. There are currently 153 member organisations (see https://www.fip.org/member-organisations), which collectively represent over four million pharmacists, pharmaceutical scientists and pharmaceutical educators around the world. The Pharmaceutical Society of South Africa (PSSA) is a full member

organisation of FIP. As all SAAHIP members are simultaneously PSSA members, they are represented in FIP by the Society. The PSSA is also a member of the Commonwealth Pharmacists Association, which has observer status at FIP. In addition, provision is made for Schools of Pharmacy to join as academic institutional members (AIMs). At present, the schools at North-West University, Rhodes University, the University of the Witwatersrand and the University of the Western Cape are part of AIM.

FIP also provides for individual membership by pharmacists, pharmaceutical scientists and pharmaceutical educators. It is this type of member who can register for a lower fee, not a member of a member organisation. Individual membership is far more affordable, as it varies by economic development status of the country where the member lives. At present, individual membership costs Euro 60 (approximately R1 200) per year for a South African pharmacist.

The supreme governance structure in FIP is the Council, where member organisations have voting rights, determine policy and elect office bearers such as the President. Individual members exercise their rights through two sets of structures. Pharmaceutical scientists are members of special interest groups (SIGs), which together form the Board of Pharmaceutical Sciences. Examples of SIGs are those for drug delivery and manufacturing, personalised and precision medicine, pharmacy practice research and regulatory sciences and quality. Pharmacists practising in a wide range of settings are members of the Sections, which in turn form the Board of Pharmacy Practice. The Hospital Pharmacy Section (HPS) represents those practising in organised healthcare settings. Each Section is run by a President and executive committee. In HPS, there are Vice Presidents for each of the World Health Organization's (WHO's) regions. However, any individual member may choose to affiliate with additional Sections (at a cost of Euro 16 per year per section for South Africans). Currently there are Sections representing academic pharmacy, clinical biology, community pharmacy, health and medicines information pharmacy, hospital pharmacy, industrial pharmacy, military and emergency pharmacy and social and administrative pharmacy. Pharmacy educators are part of FIP Education (FIP*Ed*), but can also join the Academic Pharmacy Section (AcPS), in addition to being involved in AIM. There is also a cross-cutting structure for early career pharmacists, previously known as the Young Pharmacists' Group (YPG), but now called the Early Career Pharmacists Group (ECPG).

The net result of this complex organisational structure is that individual members have many opportunities to find their own niche, seek elected office, contribute to working groups, and present at a Congress.

Structure of a World Congress

FIP World Congress' usually run from a Sunday to a Thursday. The Cape Town Congress will follow this traditional pattern. The Opening Ceremony is held on the Sunday afternoon, and usually includes keynote addresses from senior political or government figures, the presentation of awards, and also entertainment that is provided by the host country. This Ceremony is followed by a Welcome Reception, attended by all delegates and included in the registration fee. The Hospital Pharmacy Section has also traditionally provided a reception, free of charge for Section members, following the Welcome Reception on the Sunday evening. This is the first opportunity to meet fellow hospital pharmacists from around the world and to get to know the Section leadership.

On the days preceding the Opening Ceremony, the senior leadership of FIP (called the Bureau) meets, as does the Council. Individual members are able to attend the Council meeting as observers. There are also sometimes pre-conference events or training programmes.

The academic programme starts on the Monday morning, with a plenary session, followed by a large number of parallel sessions. These sessions are arranged by one or more Section or SIG, usually working in collaboration to present a topical series of podium presentations or interactive workshops. These sessions continue until the Thursday. For the most part, podium presentations are invited, not submitted. However, every Congress delegate is also able to submit an abstract for a poster presentation. Hundreds of posters are hung every year and there are opportunities for engagement between poster presenters and delegates. In the HPS, there is keen competition for a Best Poster Prize, which is awarded at the Section Dinner.

Interspersed with the academic programme, there are meetings of the Section and SIG leaderships, meetings of working groups, and also Business Meetings (akin to annual general meetings) of the Sections. Lastly, there are annual meetings of the regional pharmaceutical fora, such as the African Pharmaceutical Forum.

The PSSA will arrange South African-specific events in parallel, including annual general meetings of the Society and relevant sectors. A shortened SAAHIP AGM is expected to form part of this parallel series of meetings.

In the evenings, there are Section dinners (for which an additional charge is paid), a President's reception (to which member organisations' representatives are invited), a Fellows Dinner (by invitation only) and invited receptions hosted by various member organisations or countries, universities and regional organisations. The Closing Dinner (also requiring a separate fee) is not only a glittering gala occasion, but also an opportunity to hand over responsibility for the Congress to the next host organisation. In Brisbane, the Australian host organisations will hand over to the PSSA.

Planning for Cape Town

Usually this issue of FORUM would be the Call for Abstracts for the next SAAHIP Conference. Since no standard conference is planned, there is no call being issued at this time. That does not mean that SAAHIP members will lose out on an entire year of engagement and opportunities.

SAAHIP members are therefore urged to watch for the call for registration for the Cape Town World Congress in early 2024, and particularly for news about registration fees for PSSA members. They can also consider investing in individual membership of FIP. The Cape Town Congress will provide multiple opportunities to get involved, especially in the HPS, other Sections and SIGs, and as poster presenters. Planning ahead for leave, accommodation (if possible with family or friends), and saving for the costs involved in attending the Congress are also important. So, watch this space and get ready to engage with Global Hospital Pharmacy and the broader profession!

Cum Laude

Academy of Pharmaceutical Sciences

Diabetic foot ulcers: Highlighting the role of the pharmacist in a multidisciplinary healthcare team

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Maxine is the winner of the 2022 Young Scientist award in the practice-based category

Abstract

Diabetic foot syndrome is defined as the presence of a diabetic foot ulcer (DFU) associated with neuropathy, peripheral artery disease and infection. Consequences of diabetic foot syndrome and DFUs include reduced quality of life, financial burden, infection and subsequent amputation. The role of the pharmacist in a multidisciplinary team involved in the care of patients presenting with DFUs is paramount. This case study aims to highlight the importance of the pharmacist in a multidisciplinary healthcare team.

S Afr Pharm J 2023;90(2):43-46

Introduction

Maxine Jill Turner

Diabetic foot ulcers (DFUs) are a common complication of diabetes mellitus and occur in as many as 28% of diabetic patients presenting to primary healthcare clinics in the South African public healthcare system.[1] Consequences of DFUs include reduced quality of life, adverse economic effects, infection and amputation. Multimorbidity and subsequent polypharmacy are a common occurrence in diabetic patients due to the high likelihood of macrovascular and microvascular complications.[2] It is thus the role of the pharmacist to ensure effective and efficient treatment plans are implemented for these patients. Diabetic foot ulcers are preventable and the role of the pharmacist within a multidisciplinary healthcare team should not be overlooked. From a study examining the antimicrobial resistance patterns and past treatment plans of DFUs, the patient in this case report was chosen as it best highlights the role of the pharmacist in preventing and managing DFUs.[3]

A systematic review found that effective contributions by community pharmacists in the care of diabetic patients included patient education about the progression of diabetes, medications, and lifestyle changes as well as the monitoring of glycaemic control.[4] While the role of pharmacists in diabetes care is multifaceted, a study highlighting the current insights in the role of the pharmacist in type 2 diabetes care found that the perception of the patient regarding the role of the pharmacist is a potential barrier to enhancing patient care.[5] Patients perceive that the only role of the pharmacist is to provide medication and counselling in the use thereof, however, patients may doubt the knowledge and competency of a pharmacist in providing additional healthcare services.[5] In order to change this perception, the proactive promotion of the ability of the pharmacist to deliver additional services in the management of diabetes needs to occur.[5] The importance of improving patient perceptions should be emphasised as multiple studies have proven that extending the role of the pharmacist beyond dispensing medication in the context of diabetes care has resulted in improved patient outcomes.[4,6-8] The case report below highlights the need to encourage the extended role of pharmacists in managing DFUs.

Case report

A diabetic patient presented to the podiatry unit at the Charlotte Maxeke Johannesburg Academic Hospital on 12 January 2022 for treatment of a DFU (Figure 1). The patient is a 48-year-old, type 2 diabetic female with no history of a previous amputation. This patient had presented with a lower foot ulcer one year and three months prior to 12 January 2022, with no improvement made to the wound, despite treatment. The patient reported making

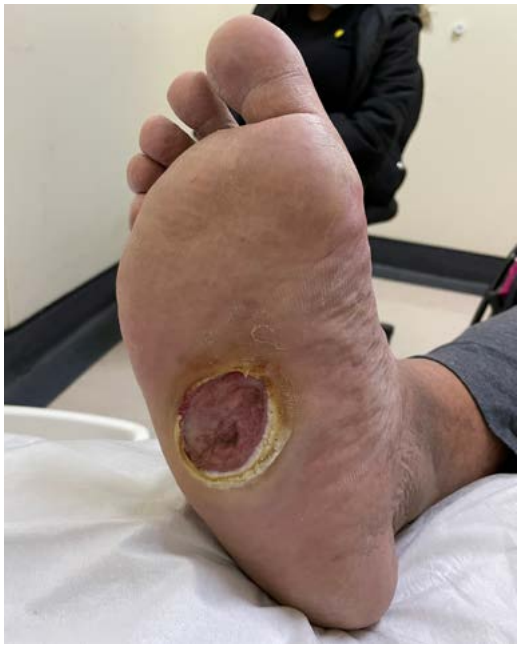

Figure 1: The diabetic foot ulcer of patient A020 (Ethics approval: M210431)

use of a removable walker as a pressure off-loading device and preventative measure against DFU while in public, and crutches or a wheelchair at home. Concurrent chronic conditions for this patient included hypertension, dyslipidaemia, congestive heart failure and asthma.

The patient's chronic medication list comprised of 14 different medications (Supplementary Table I). Insulin was used for glycaemic management. For the treatment of dyslipidaemia, the patient was prescribed two β-Hydroxy β-methylglutaryl-CoA (HMG-CoA) reductase inhibitors.

For the treatment of hypertension and heart failure, five medications were noted including two beta-blockers. For neuropathic pain, the patient was prescribed both amitriptyline and carbamazepine. This patient was also prescribed an anti-epileptic medication (topiramate), a benzodiazepine, a selective serotonin re-uptake inhibitor and zolpidem for the treatment of insomnia. From this list of medication, the potential for multiple unwanted drug-drug interactions exists (Table I). A total of six potential minor interactions, six moderate interactions and seven severe interactions were noted. The most common

Table I: Summary of the potential drug-drug interactions of patient A020 is at risk of developing. Interaction information was taken from the South African Medicines Formulary as well as the Essential Medicine Guidance interaction checker (available at: https://emguidance.com/interactions)

Drug A	Drug B	Interaction severity	Potential effect of interaction
Atorvastatin	Simvastatin	Minor	Myopathy, rhabdomyolysis, hepatotoxicity
Atorvastatin	Carbamazepine	Minor	Hepatotoxicity due to increased serum levels of carbamazepine
Atorvastatin	Citalopram	Minor	QT interval prolongation, side effects of citalopram increased
Atorvastatin	Amitriptyline	Minor	QT interval prolongation risk due to increased serum levels of amitriptyline
Simvastatin	Citalopram	Minor	QT interval prolongation, side effects of citalopram increased
Amitriptyline	Carbamazepine	Minor	Increased anticholinergic effect, hyponatraemia, seizure (especially in elderly)
Simvastatin	Carbamazepine	Moderate	Hepatotoxicity
Amlodipine	Simvastatin	Moderate	Myopathy or rhabdomyolysis
Hydrochlorothiazide	Citalopram	Moderate	Hyponatraemia, QT interval prolongation, Torsade de pointes risk, hypokalaemia, cardiac arrhythmias
Hydrochlorothiazide	Amitriptyline	Moderate	Hyponatraemia, QT interval prolongation, Torsade de pointes risk, nephrotoxicity, cardiac arrhythmias, increased hypotensive effect
Alprazolam	Zolpidem	Moderate	Complex sleep behaviours, CNS depression
Lisinopril	Hydrochlorothiazide	Moderate	Renal failure, increased hypotensive effect
Lisinopril	Atenolol	Severe	Fatal hyperkalaemia in at risk patients, cardiac arrhythmias, increased hypotensive effect
Lisinopril	Propranolol	Severe	Fatal hyperkalaemia in at risk patients, cardiac arrhythmias, increased hypotensive effect
Lisinopril	Amlodipine	Severe	Fatal hyperkalaemia in at risk patients, cardiac arrhythmias, increased hypotensive effect
Propranolol	Atenolol	Severe	Fatal hyperkalaemia in at risk patients, cardiac arrhythmias, PR interval prolongation, additive bradycardia, increased hypotensive effect
Atenolol	Amlodipine	Severe	Cardiac failure, fatal hyperkalaemia in at risk patients, additive bradycardia, cardiac arrhythmias, increased hypotensive effect
Propranolol	Amlodipine	Severe	Cardiac failure, fatal hyperkalaemia in at risk patients, additive bradycardia, cardiac arrhythmias, increased hypotensive effect
Amitriptyline	Citalopram	Severe	Hyponatraemia, QT interval prolongation, serotonin toxicity, Torsade de pointes risk

potential adverse outcome was that of cardiac arrhythmias and hyperkalaemia.

Discussion

It has been found that diabetic patients are twice as likely to experience a drug-drug interaction when compared to patients without diabetes due to the presence of multiple comorbid conditions in diabetic populations.[2] A study undertaken in Jordan found that interventions put forward by a clinical pharmacist reduced prescribing errors in diabetic patients with major polypharmacy by 88.1%.[9] From the list of medications for patient A020, it can be seen that there are various duplications in treatment, where medications have the same mechanism of action and treatment outcome. For example, atorvastatin and simvastatin are both lipid-lowering agents prescribed to this patient and atenolol and propranolol are both beta-blockers. By eliminating one beta-blocker and one lipid-lowering agent, the number of potential drug-drug interactions is reduced by seven. This point highlights both the importance of reviewing a patient's medication list and the role of the pharmacist in patient healthcare.

In the case of patient A020, it should be of concern that the majority or severe interactions may result in fatal hyperkalaemia and cardiac arrhythmias and that the additive effect of these medications may put the patient at risk for development of either event, given the patient's history of cardiac conditions. The patient's medication list should be reviewed at every visit to ensure that unnecessary medications resulting in polypharmacy are not taken by the patient.

Consideration should also be taken that in the case of many potential mild and moderate interactions, evidence-based medicine has shown that the likelihood of the interactions occurring is minimal.[10] In these cases, the benefit of using the combination of medicines often outweighs the risks. This highlights the importance of communication between prescribing members of the healthcare team and the pharmacist.[10]

In Africa, the use of protective footwear as a preventative measure is not routinely prescribed when compared to Western countries, largely as a result of the poor socio-economic factors present in Africa.[11] All healthcare providers at primary level, including pharmacists, should be able to carry out basic screening examinations as well as provide the education required in order to prevent and manage DFUs.[12,13]

A study carried out in the Tshwane district of South Africa found that both diabetes care and screening practices were sub-optimal.[14] Only 6% of participants had been noted to have received a foot examination within the previous year.[14] Another South African study determined that only 32.5% of patients had their feet examined by a doctor or nurse and only 5.8% had their feet examined by a podiatrist where no data was available pertaining to pharmacists.[15]

When looking at the preventative measure used by patient A020, it is promising to see that the removable walker is being used. The removable walker is considered one of the gold standard methods of pressure off-loading in DFU patients.[13] However, the patient stated that she only makes use of the removable walker in public. Ideally the patient should use the removable walker at all times in order to improve healing time and prevent ulcer reoccurrence. The patient was aware of this fact but noted the cumbersome nature of wearing the removable walker in the home space. This suggests that the patient has been well-informed about preventative measures use and foot care but patient adherence was non-compliant.

A systematic review evaluating methods to overcome patient non-adherence concluded that community pharmacist-led interventions have shown to improve patient adherence.[16] These interventions included an educational component which again highlights the importance of continued patient education.[16] A systematic review examining pharmacist-led foot care interventions in diabetic patients concluded that pharmacists are both accessible to the public and capable of numerous foot care interventions to patients with diabetes, helping prevent or detect problems and provide prompt interventions.[17]

Conclusion

Pharmacists are important role players in a multidisciplinary healthcare team and are directly involved in both medication supply and patient management. In the case of diabetic patients, a pharmacist is ideally positioned in the healthcare team to provide patient education and screening services over and above ensuring safe medication use. In addition, a pharmacist should ensure that multiple chronic medication use by the patient does not contribute negatively towards the development or progression of additional complications including DFUs. Pharmacist-led interventions include: counselling the patient on the importance of controlling their blood sugar levels, lifestyle modification advise and explaining risk factors that predispose an individual to developing DFUs.[18] In addition, pharmacists can advise on the importance of foot hygiene, appropriate footwear and preventative measure use.[18] The role of the pharmacist as part of a multidisciplinary healthcare team should therefore not be overlooked.

Supplementary data

Table I: A summary of patient A020's medication and preventative measure use

Medications	Indication	WHO ATC classification
Insulin	Type 2 diabetes mellitus	A10A
Atorvastatin	Dyslipidaemia	C10AA05
Simvastatin	Dyslipidaemia	C10AA01
Lisinopril	Hypertension/heart failure	C09AA03
Atenolol	Hypertension/heart failure	C07AB03

Propranolol	Hypertension/heart failure	C07AA05
Hydrochlorothiazide	Hypertension/heart failure	C03AA03
Amlodipine	Hypertension/heart failure	C08CA01
Medications	**Indication**	**WHO ATC classification**
Amitriptyline	Depression/neuropathy	N06AA09
Carbamazepine	Epilepsy/Neuropathic pain	N03AF01
Topiramate	Epilepsy	N03AX11
Alprazolam	Depression	N05BA12
Citalopram	Depression	N06AB04
Zolpidem	Insomnia	N05CF02
Preventative measure use		
Removable walker used when in public Crutches or wheelchair used when at home		

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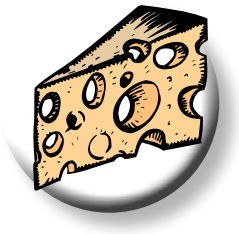

Deliveries… going the extra mile!

Gary Black

One of the positive *side effects* of the COVID-19 epidemic has been the expansion of delivery services. Pharmacy, of course, has provided such delivery services for decades with courier services of chronic medicine becoming the norm in more recent times. By the early 1990s, a pharmacy delivery service had become prohibitively expensive and pharmacies needed to levy a fee for this service. However, in Fish Hoek, we had many elderly patients who physically just could not get to the pharmacy, so deliveries remained an essential free service offered by the pharmacies in our valley.

Granted, the world of pharmacy was certainly a different place some 32 years ago when I first moved to Fish Hoek to manage Hillside Pharmacy. This small pharmacy had clients of twenty to thirty years standing, thanks to the ethos of good customer service which had been established by the original owner "Snowy" McInroy. Now, everybody knows that I personally subscribe to the philosophy that community pharmacy is first and foremost a professional service business rather than a product or price business. So I enjoyed building on the legacy of good professional service that I had inherited and was constantly encouraging the staff to excel in this regard.

Deliveries were certainly a vital ingredient in our service mix as many of our ageing clientele were, if not permanently impaired, often just too ill or tired to visit the pharmacy. This made Karl, our deliveryman, an important link in the chain of service and communication, which we strived to maintain with our housebound patients. Karl had been part of Hillside Pharmacy forever and had been well-schooled by "Snowy" in the art of customer service. He understood very well that he was the face of Hillside Pharmacy out there and had developed the knack of ***"looking after his customers"***. I was soon to discover the extent to which he had perfected ***the art of going the extra mile.***

It happened like this… Within 50 metres of the pharmacy was a residential hotel where there lived a number of elderly widows who were clients of the pharmacy. One quiet morning Karl ambled out with two or three deliveries for these *"old ducks"*. I got busy and only realised about an hour later that he was still not back. I then had a call for an urgent delivery of prescribed medicine. However, I now noticed that, not only had Karl not returned, but the delivery bike was also missing!

By the time he sauntered back into the pharmacy, I was fuming and ready to take his head off! I packed him off with strict instructions to deliver the urgent prescription medicine and to be back within 20 minutes. On his return he had to face my wrath and explain how a 10-minute delivery by foot had turned into a situation where he had disappeared for over an hour. His reply was simply; "But Mr Black, you don't understand, ***I was looking after my customers!***" After much frustration and questioning the ***real*** story emerged.

Fish Hoek, as we all know, had always been a "***dry"*** town. By ancient decree there were no liquor stores in the town and this was still the case in the early 90s. This did not mean that the *"old ducks"* of the residential hotel were not partial to a little sherry or *"medicinal"* brandy. Now Karl himself was a man who found it difficult to refuse the offer of an alcoholic beverage and so it was natural for him to sympathise with the plight of "***his***" customers who had no means of transport. So, over the years, it had become the norm for him to ***look after "his" customers*** by literally ***going the extra mile*** via the *"Bottle"* store in Kalk Bay on his delivery round to the residential hotel which was within spitting distance of the pharmacy! A refreshing cold beer on a hot summer's day or a good red wine round a cosy fireplace count amongst my own many vices. As stated earlier, I also believe in service above all else, so who was I to argue about this unique delivery service. My clients were happy, Karl earned his *"Christmas box"* and the medicine was delivered with a smile and ***a little extra on the side!***

P.S. Although this was before the days of "*Direct Medicines"* and other courier services, I ask you, "How could they compete with this great service?". I can assure you that all the current Good Pharmacy Practice standards applicable to the delivery of medicine, cold chain management, confidentiality, etc., were complied with, so, even the South African Pharmacy Council would not be able to find fault!!!

Ek sê maar net!

Delivery of medicine… some practical suggestions

Gary Black
(Dip.Pharm) FPS

Introduction

There is a need for the delivery of medicine from many pharmacies, whether it be for emergencies or mere convenience. While a delivery service can be used effectively to improve access to medicine, the system must be set up under the control of the pharmacist, be sufficiently robust and secure so as to ensure that the safety, integrity and efficacy of the medicine is not compromised, and be underpinned by effective communication with the patient to ensure adherence to treatment. This article attempts to highlight some practical suggestions as to how this can be achieved.

Rights and responsibilities

The patient

An important objective of the National Drug Policy is that all patients must have access to safe and effective medicine dispensed with appropriate professional advice and information.[1] While home/personal deliveries will improve patient access to medicine, the system must not compromise the safety and efficacy of the medicine. In exercising their right of access to medicine in terms of the Patients' Rights Charter, patients also have obligations to cooperate with the pharmacist.[2]

The pharmacist

The pharmacist is key to ensuring access, efficacy and cost effectiveness of medicine through the practice of pharmaceutical care as set out in Good Pharmacy Practice (GPP) Regulations.

With respect to delivery of medicines ***the pharmacist's responsibility extends beyond the point of delivery of the medicine to the patient, as he must also accept responsibility for the outcomes of the treatment.***[3]

The pharmacist has ethical and legal obligations to implement a safe delivery system of medicine which will include measures to ensure:

- effective communication, with sufficient patient information to maximise patient understanding of and adherence to treatment;
- the safety, integrity and efficacy of the medicine;
- a verifiable audit trail to monitor the service;
- patient confidentiality;
- appropriate insurance;
- standard operating procedures (SOPs) and training of all involved;
- a written service level agreement with the delivery agency to ensure adherence to the agreed system and standards. If an in-house system is used, staff training in the relevant SOPs is important;
- monitoring of the system for both cost-effectiveness and success of deliveries.

The pharmacist has additional responsibilities to ensure compliance with the following GPP Regulations: *2.7.5 Delivery of medicines*[4] *and* 2.7.1.3.1 *Supply of medicine*[5] and *The Code of Conduct: 1.9 Control over medicines.*[6]

In particular, the following sections must be noted:

- *All efforts must be made to enable access to counselling of the patient by a pharmacist;*
- *Every prescription dispensed in a pharmacy must be seen by a pharmacist and judgement made by him/her as to what action is necessary;*
- *A pharmacist responsible for supervising the dispensing, sale or supply of any medicine in a pharmacy bears the associated legal and professional responsibility;*
- *Systems must be developed to ensure that the distribution of medicines is reliable and secure to the point of delivery.*

The delivery agency

Because medicine is not an ordinary commodity, the supply and delivery system is subject to regulation to ensure the security and integrity of the product. This responsibility ultimately rests with the pharmacist supplying the medicine. To this end then, the pharmacist must ensure that the agency providing the delivery service understands the special requirements with regard to medicine delivery. The delivery service provider must undertake to adhere to these requirements, which should, at the very least, be set out in a service level agreement. If an in-house system is used, this would obviously form part of the job description of the delivery employee.[4]

Communication with the patient or caregiver[4,5]

When a person other than a pharmacist delivers medicines to a patient or a patient's caregiver, the pharmacist must furnish comprehensive written instructions that shall include the patient's details and

information regarding the correct use of the medicine, as well as the statement and a patient information leaflet, add appropriate warning labels and instructions for correct storage of the medicine.

- Make sure that the patient or caregiver has the pharmacist's contact details and that he is personally available to handle any queries regarding the medicine.
- Once the delivery has been made, make a follow-up call to the patient or caregiver to ensure that there is a clear understanding of the dosing and storage instructions, that the patient is reacting well to the medicine and to assure the patient of your concern and availability to assist if they encounter any problems.
- Patients should also be informed of how they can obtain further professional advice or information about the medication that they have received, or the condition being treated.
- Information on how patients can access the delivery service should be made available, e.g. via a website.

Adherence

Access to medicine through an efficient delivery system does not of itself constitute adherence. Adherence to treatment also requires the patient to be taking the medication regularly in accordance with the instruction and advice of the pharmacist.[5]

Pharmacists must ensure that patients receive sufficient advice to enable the safe and effective use of their medicines. On each occasion a medicine is to be delivered via a collection and delivery scheme, the pharmacist must use his professional judgement to assess whether direct contact with the patient or the carer is necessary.[4] Patients should also be informed of how they can obtain further professional advice or information about the medication that they have received, or the condition being treated.

Safety and integrity of medicine delivered

Right medicine, right patient

- Obtain explicit written consent/request from the patient to participate in the delivery system, especially for regular delivery of chronic medication.
- The signed consent form must include address details, agreed time and date of delivery, and the name of the person authorised to accept delivery.
- A copy of the signed consent form is to be kept with the patient record and be easily accessible.

Integrity of the product

- The medicine must be packaged in such a manner that it will guarantee the safety, quality and efficacy of medicines in accordance with the registration requirements for such medicine in terms of the Medicines Act, throughout the delivery process.[5]
- Pack medicine securely to prevent damage, for example, bottles should be wrapped.
- Maintain required storage conditions with regard to temperature and light. Parcels should be sealed and opaque packaging used. Only the details of the patient's name and address should be visible on the outside of the package.
- Parcels should be transported in insulated, lockable containers (delivery boxes or bags).
- Specific measures must be in place to maintain the correct temperature for cold chain items. Specifically assigned cooler boxes appropriately prepared with ice blocks should be used.

The delivery agent

- If someone other than the patient or person who handed in the prescription is sent to collect on behalf of the patient, record the ID, signature and printed name of the person making the delivery.
- Keep a file on the delivery personnel including photocopy of ID, driver's licence and contact number.
- Give precise instructions to the messenger in relation to:
  - Security of package during delivery;
  - Who may receive the package (an adult);
  - Action to take if responsible person is not present to take delivery.

The delivery

- The pharmacist should do a final check of the parcel before sealing it for delivery. It is important to ensure that any additional written information, warning labels or medicine measures etc., are included.[5]
- Obtain the signature of the authorised recipient for receipt of package on delivery. If the authorised person or patient cannot receive the parcel, it may be left with another responsible adult who must sign for the parcel.
- If a delivery cannot be successfully completed, the item should be returned to the pharmacy, with a note to the patient to contact the pharmacy to arrange another delivery time.
- The delivery agent should be able to contact the pharmacy immediately to report any problems, such as delays, damage to parcels, etc.
- A reminder service to the patient to expect delivery should be in place, e.g. SMS or e-mail messages.

The audit trail

- Use a self-carbonating triplicate book/system to record the order; this enables you to have one working copy for the dispensary, copy for the patient and a hard copy for future reference. If an electronic system is used the same principle applies.
- Record at least the following details in taking the request for delivery of medicine:
  - Patient details, time of despatch, name and contact details of person making the delivery;
  - Delivery address, name and contact details of responsible adult who will receive the medicine, agreed time of delivery;[5]
  - Name and signature of pharmacist checking the parcel and authorising delivery.
- Delivery sheet to include:
  - Name and address of patient;
  - Name and contact details of responsible adult who will take

delivery of the parcel, agreed time that delivery is expected;
- Printed name and signature of person accepting the parcel and time of delivery, i.e. proof of delivery.

- A calling card is to be left if no one is available to receive the parcel. Details on the card to include time of unsuccessful delivery, name of messenger, name and contact person with whom to make alternative arrangements, an explanation that the medicine would be returned to the pharmacy.
- Medicine returned to the pharmacy must be signed for by the pharmacist who accepts the returned parcel. He should immediately contact the patient or caregiver to make alternative arrangements.
- The messenger should use a cell phone so that he can immediately communicate any problems or delays encountered.
- Electronic communication systems, such as *WhatsApp* and others, can be used to make the speed of communication even easier.

Confidentiality

All pharmacy staff and persons involved in collecting prescriptions and delivery of dispensed medicines will need to understand, and comply with, confidentiality requirements.[7] Training and a signed confidentiality undertaking is required.

Dispensed medicines must be packaged so that only details of the patient's name and address are visible on the outside of the package.

Insurance

Pharmacists are required to ensure that all activities they undertake are covered by professional indemnity insurance and must make sure that their indemnity insurance covers involvement in collection and delivery schemes.[8]

An insurance system should be in place to sufficiently cover losses and damages incurred regarding the medicine, delivery personnel and vehicles. Remember that your business insurance does not usually cover any private vehicles used for deliveries.

Service level agreements and SOPs

The pharmacist is legally and professionally liable for the delivery of the medicine and its safe use by the patient and must make sure SOPs for the delivery system are in place.

If an in-house delivery system is used, the pharmacist must also make sure that the necessary training of personnel takes place and of adherence to the SOPs.[9]

If a delivery agency is used, a service level agreement should form part of the contract and should include at least the following:

- An undertaking to adhere to the standards set out by the pharmacy including any additional training when necessary.
- To constantly develop an open relationship with the pharmacy based on effective, mutual communication.
- Be subject to a regular review of the effectiveness and efficiency of the system.
- That the pharmacist's first responsibility is to the patient and he therefore reserves the right to cancel any agreements with the delivery agency should they not adhere to agreed standards.
- That there will be no undue solicitation of patients to use their services; to be transparent regarding their charges and not to charge excessively.
- To accept responsibility for the cost of lost or damaged goods.

Conclusion

Perhaps the slogan for a medicine delivery service should simply be:

The right medicine, to the right patient, under the right conditions, at the right time, with the right advice!

Disclaimer

This document is a guideline and does not necessarily reflect official policy of the Pharmaceutical Society of SA. Any person wishing to implement proposals made in this document must do so in accordance with the requirements of the Pharmacy Act, Medicines & Related Substances Act and all other relevant legislation, and, if necessary, should seek legal advice to ensure compliance.

For copies of the references or any further information please contact the author: gary@pssacwp.co.za.

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Chronic pain management gets a new impact player

The launch of a wearable pulsed shortwave therapy (PSWT) device with a 10-year track record in the US, Canada and Australia is set to give chronic pain sufferers in South Africa a shot at improved quality of life.

Chronic pain management remains one of the challenges in the medical profession. Adding to conundrums such as balancing medicine use with quality of life, is the reality that the central nervous system can become stuck in a centrally sensitised pain state. Central sensitisation – as this process is called – changes a person's pain sensitivity, allowing the perception of pain to continue even after an injury has healed. This is because pain thresholds are lowered, leading to a heightened perception of pain. Stimuli that are normally painless can produce pain, while stimuli that produce pain will produce pain at much higher levels (hyperalgesia).[6]

Central sensitisation can be associated with well-known chronic pain culprits such as lower-back and neck pain, and the agony caused by osteoarthritis in the knee.[1]

It is precisely for these conditions that ActiPatch® promises relief, says Garth Maart, marketing manager, OTC division for Adcock Ingram SA, the company licensed to distribute the device locally. "The concept of using electrical therapy to enhance healing is well-known and widely used in devices such as pacemakers and the TENS machine. Different to the TENS machine, ActiPatch® is a device that is generally worn on the skin, attached with the tape provided," explains Maart.[3]

The strength of the low-power electromagnetic signal that the ActiPatch® generates (27.12 MHz)[6] is further reduced by pulsing the signal, hence its name: low power **pulsed shortwave therapy** (PSWT).[5,6]

In very simple terms, PSWT devices such as ActiPatch® increase background physiological noise.[6] Although the stimulation is below the sensory level due to its low power and pulsed nature, the central nervous system still 'sees' an increase in afferent noise and, over time, raises the pain tolerance thresholds through the habituation process. In essence, PSWT distracts the central nervous system by giving it new peripheral information to focus on. In this way, pain is treated by moving the individual out of a centrally sensitised pain state.[6]

ActiPatch® has been available for about 10 years and has been approved in Canada, the US and Australia.

More about ActiPatch®

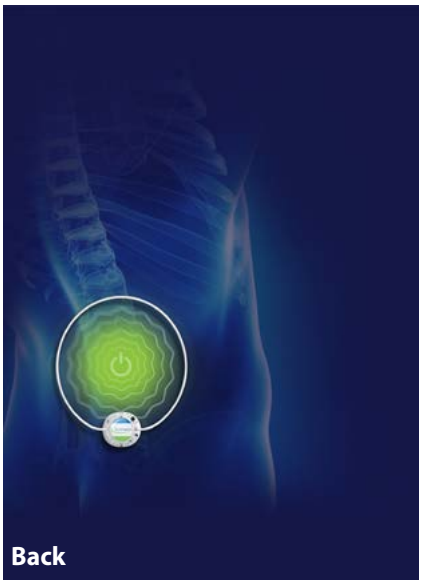
The device consists of three components, namely an integrated circuit, an antenna and a - lithium battery (3V). When the antenna is placed over the area to be treated, radio-frequency energy from the antenna is transferred into the target tissue as a localised therapy.[1]

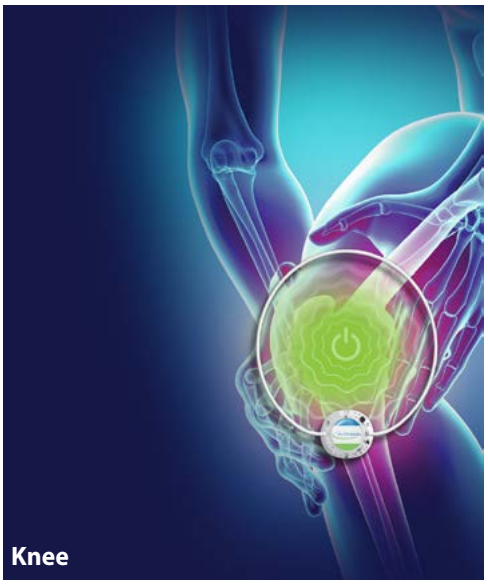
ActiPatch® is indicated for the adjunctive treatment of musculoskeletal pain and should be used for between 12 and 24 hours per day.[3] Pain relief is not immediate; it could take three to four days for the therapy to take effect.[3]

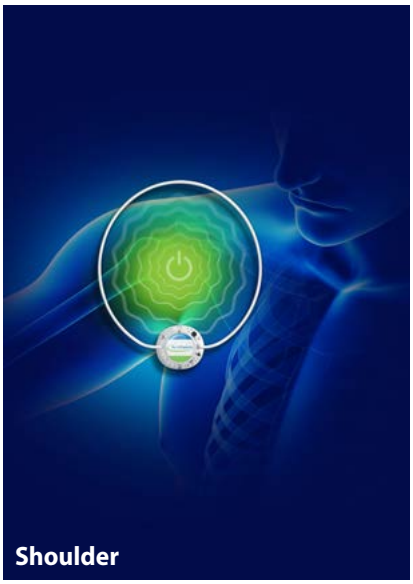
Depending on the severity of the injury, patient pain levels can begin to subside after only 2–3 hours of wearing the device and will continue to decrease as long as the device is being used continuously or at least 12 hours per day.[3] If the device is used in this way, it may last up to two months before replacement is required – the current design does not have a replaceable battery.[3]

ActiPatch® Medical Device – Musculoskeletal Pain Relief. Pack shot

Images demonstrating device activated







Daily treatment may be continuous or intermittent and overnight therapy is an effective option. The low-power energy ensures that the device does not produce any sensation, be it heat, noise or vibration.[3]

ActiPatch® may be used during regular physical activity and while it is not waterproof, normal sweating does not affect it.[3] It is safe for patients with diabetes and arthritis, as well as the elderly or bedridden.[3] However, the device should not be placed directly over a cardiac pacemaker, implanted defibrillator, deep brain stimulator, nerve stimulators or other active implantable devices.[3] It should also not be used on children younger than 18[3], pregnant women or cancer patients as there is no data on its safe use in these patient categories.[3]

While not a prescription therapy, ActiPatch® will only be available in pharmacies, carrying a warning for consumers to consult their pharmacists on its use.

"Adcock Ingram is proud to bring ActiPatch® to South Africa," says Maart. "We have no doubt that it can help provide chronic pain sufferers a new lease on life."

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About Adcock Ingram

Adcock Ingram is a leading South African pharmaceutical manufacturer listed on the Johannesburg Stock Exchange. The Company manufactures, markets, and distributes a wide range of healthcare products and is a leading supplier to both the private and public sectors of the market – ranked as the second largest manufacturer in the private pharmaceutical market and is the second largest supplier to the public sector.

The Over the Counter (AI OTC) division manufactures, markets and sells medication with a focus on brands sold predominantly in retail pharmacy, where the pharmacist plays a role in the product choice. Pharmacy-initiated therapy is the main driver of product use in the Schedule 1 (S1) and Schedule 2 (S2) space, satisfying a growing need for primary healthcare in South Africa.

Adcock Ingram is a level two B-BBEE contributor.

Managing Chronic Constipation for Pregnant and Breastfeeding Moms

Combines MACROGOL and ELECTROLYTES*

Constipation relief without gain or loss of significant amounts of water or electrolytes.

- About **11 to 38 % of women get constipated at some point during pregnancy**. A patient is most likely to get constipated in the third trimester however, **constipation can occur in all three trimesters**[2,3]
- Constipation negatively affects pregnant women's daily lives and is **second only to nausea as a common gastrointestinal complaint in pregnancy.**[2]
- **MOVICOL** contains polyethylene glycol (PEG), which is an osmotic laxative that works by increasing the water content of the stool, making it easier to pass. **PEG is considered suitable during pregnancy** because it is not absorbed into the bloodstream.[2]
- **Hormone changes** within the body **during pregnancy, can increase the chances of constipation**. [4]

SA's value leading laxative[5]

*If patients develop any symptoms indicating shifts of fluids/electrolytes (e.g. oedema, shortness of breath, increasing fatigue, dehydration, cardiac failure) MOVICOL should be stopped immediately and electrolytes measured and any abnormality should be treated appropriately.

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