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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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Guest Editorial

Making the most of an accredited South African Pharmaceutical Journal

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For many years, whenever the possibility of achieving recognition for the South African Pharmaceutical Journal (SAPJ) as an accredited, peer-reviewed academic publication was raised, South African pharmacy academics were implored to "sacrifice" their own or their students' work by publishing it in the journal. The assumption was that, through demonstrating the existence of an appropriate peer review process and the publication of academic articles, the relevant authorities could be persuaded to recognise the publication as worthy of accreditation. Those publications submitted prior to accreditation would not be recognised as peer-reviewed and would not attract the subsidy provided to universities by the education authorities. They would, however, be considered "published", so could not be submitted elsewhere. Academics' reluctance to contribute to this process was thus understandable.

In September 2025, the editor of the SAPJ announced that the journal had been included in the Department of Higher Education and Training's accredited Scopus list.[1] She pointed out that the journal now carries "a disproportionate responsibility and opportunity — it is the primary accredited, local journal fully dedicated to pharmacy in South Africa, and one of only a handful across the continent that blends discipline specificity, accreditation, and continental identity". She expounded on the responsibility to ensure that the journal maintains the required quality standards, proposing in addition that there should be a focus on "contested questions — around policy, equity, cost, accessibility".

While not detracting from the journal's remit to cover issues of relevance at the African and global levels, it is worth highlighting some of the burning questions that need urgent attention in the South African pharmaceutical arena. Manuscripts that address these questions, not only exploring the problems in depth, but offering potential solutions, are urgently needed. Locally relevant and rigorous scholarship will make the most of an accredited SAPJ.

There are design elements of the South African health system that seem so "hard baked" as to be immovable. They are "designed" in the sense that they represent political choices and compromises at particular points in colonial and post-colonial periods of history and are now entrenched. An early choice made at the time of Union was to separate preventive and curative functions. Preventive health, which was defined rather idiosyncratically to include such services as family planning and psychiatry, was to be the responsibility of the central government, while the four new provinces were entrusted with delivering curative health services. The separation had first been introduced in the Cape Colony in 1897. David Harrison has covered the ways in which public health advocates argued for a co-ordinated approach to the delivery of health services but failed to make any progress.[2] At various points, Commissions of Inquiry tried to find a way forward. The 1925 Committee of Inquiry into Public Hospitals and Kindred Institutions was followed by the National Health Services (Gluckman) Commission, which sat from 1942 to 1944. Despite these forays into what would now be considered universal health coverage (UHC) ideas, the separation between preventive and curative health was retained in the 1977 Health Act. That decision had implications for the supply of medicines, in that hospitals operated by the Department of National Health and Population Development, as well as family planning clinics and the homeland health services, relied on the Defence Force medicine depots until the late 1980s.

While less easily traced in historical documents, the separation between the public and private health sectors in South Africa is also well entrenched. The Gluckman Commission envisaged a unitary health system, but implementation failed even before the 1948 election.[3] While by no means aiming to abolish the private health sector, the 2023 National Health Insurance Act has the potential to overturn more than a century of sustained divisions in the South African health system. In particular, the NHI Act will radically affect the powers and roles of the provinces in ways which are still somewhat unclear. There is even less certainty regarding the ways in which medicines will be selected, priced, procured or reimbursed by the National Health Insurance (NHI) Fund. There are principles outlined (such as the use of health technology assessment), some structures

defined (and even some in nascent form), but many unanswered questions. The SAPJ presents a wonderful opportunity to publish analyses of the options, assessments of the policy choices, and descriptions of early implementation and its impact.

UHC, whether in the form outlined in the contested NHI Act or some variant that emerges following legal challenges to the legislation, will depend on the availability of sufficient financing, health infrastructure and human resources. South Africa's pharmaceutical infrastructure is currently divided sharply between public and private sectors, notwithstanding the few public-private partnerships and under-utilised "pick-up-points" for repeat medication. South Africa is in the anomalous situation of having insufficient pharmaceutical human resources, inequitably distributed, but simultaneously at risk of producing more pharmacy graduates than the existing health system can absorb. NHI holds out the promise of being able to bring the entirety of South Africa's pharmaceutical human resources to bear in meeting the health needs of the country. However, much rests on how medicines supply will be reimbursed and how clinical services are valued. The SAPJ would welcome analyses of the current situation, efforts to address the divisions and shortcomings of the past, and evidence of the added value of expanded pharmacy services. The South African Pharmacy Council's efforts to reform the role of pharmacy support personnel and develop sustainable specialist registers are also deserving of close scholarly attention.

The impact of centuries of colonial rule, *apartheid* health policies and continued dysfunction in South Africa's health system are evident in the burden of disease faced by communities.[4] Equitable access to affordable, quality-assured essential medicines is critical to any efforts to deliver UHC and ameliorate South Africa's burden of disease. Like many African health systems, the South African public sector has been focused predominantly on the delivery of episodic, acute care for communicable diseases. The private sector is also not able to ensure effective, people-centred, differentiated delivery systems geared to long-term management of non-communicable diseases. Distance dispensing options, whether in the public or private sectors, are poorly designed to support adherence and persistence, with responsive monitoring of health outcomes. Health information systems are also poorly developed or fragmented. While electronic health records hold out the possibility of improved access to data, transforming those data into actionable health management information and ensuring its effective use remain challenges across the entire South African health system. By focusing particularly on the role of essential medicines and their impact, South African academics and health practitioners can contribute to bridging this gap.

The COVID-19 pandemic has raised global interest in the challenges of ensuring health technology supply security, including for essential medicines and vaccines. Geographically diversified production of both active pharmaceutical ingredients and finished pharmaceutical products is now being actively pursued by national, regional and continental bodies. The entire pharmaceutical ecosystem requires attention, from industrial policies to regulatory capacity, from tax incentives to pricing practices, from pooled procurement to reliance. Although South Africa has not yet, inexplicably, ratified the treaty establishing the African Medicines Agency, it is already heavily engaged in continental efforts to build reliance, work-sharing and eventually mutual recognition options. At the same time, the South African Health Products Regulatory Authority (SAHPRA) is pursuing Maturity Level 3 status with the World Health Organization for medicines regulation, having already achieved that status for vaccine regulation. Continued reform of South Africa's medicines regulatory system will require the passage of a new SAHPRA Act, finally consigning the 1965 Medicines and Related Substances Act to the history books. While the development of the new law has already commenced, that effort is occurring without an underpinning national medicines policy. The 1996 National Drug Policy no longer provides a meaningful set of policy directives, nor does it cover what would be needed in a unified health system aimed at UHC. The SAPJ provides a suitable "home" for publishing relevant policy analyses, learning from past experience and outlining the options for the future, while tracking the implementation and impact of emergent policies. A fit-for-purpose National Medicines Policy will depend on the evidence generated by those scholarly endeavours.

South Africa's experiences during the COVID-19 pandemic have also spurred the development of the Department of Science, Technology and Innovation (DSTI) - National Research Foundation (NRF) Institute for the Preparedness and Prevention of Pandemics (IP3).[5] This effort brings together 10 South African universities. Every element of the pharmaceutical value chain, from research and development to manufacturing, distribution and effective use will require attention. Among the expected outcomes are "rapid development pipelines for vaccines, diagnostics and therapeutics generated locally rather than relying on global supply chains", "expanded clinical trial and laboratory capacity across the country and, eventually, the region", and "stronger, more resilient health systems able to respond quickly to threats while maintaining essential services".

Each of those outcomes echoes elements already explored in this editorial. Each represents a research imperative that the pharmacy profession cannot afford to ignore. Each represents an opportunity to build the reputation of the SAPJ as a preferred journal to publish high-quality and locally relevant manuscripts.

Dr Andy Gray
Associate Editor SAPJ

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Sanofi receives registration for Beyfortus® in South Africa to protect infants against RSV

Sanofi is pleased to share that the South African Health Products Regulatory Authority (SAHPRA) has granted registration for Beyfortus® (nirsevimab), a long-acting monoclonal antibody designed to protect infants against Respiratory Syncytial Virus (RSV).

Beyfortus® is the first long-acting monoclonal antibody designed to provide protection across the RSV season for all infants, including those born at term, preterm, or with underlying conditions. It is given as a single intramuscular dose just before or during the RSV season[1] and is expected to be available before the 2026 RSV season.

RSV is one of the leading causes of Lower Respiratory Tract Infections (LRTIs) such as bronchiolitis and pneumonia in young children, and a major driver of hospitalisation in infants under one year of age.[3] Globally, RSV is responsible for 20 to 40% of pneumonia and 40 to 80% of bronchiolitis hospitalised cases among infants under one year of age.[2]

It was estimated that in a year, RSV caused around 33 million acute lower respiratory infections in children younger than five years, resulting in 3,6 million hospitalisations and over 100 000 RSV-attributable deaths globally.[3] RSV-related medical costs in this age group are estimated at €4.82 billion per year, including hospital, outpatient, and follow-up care.[7]

In South Africa, RSV infections occur year-round with a strong seasonality from February to May.[4] Each year in South Africa, there are approximately 96 000 cases of RSV severe acute respiratory illnesses in children under five years of age, and among newborns under one month, about one in seven requires admission for severe RSV.[9] The incidence and severity of RSV LRTI are highest in infants under 6 months of age, representing 22% of all-cause hospital admissions in this age group. 41% of the LRTI-related hospitalisations are attributable to RSV.[5]

RSV infections also have long lasting consequences as a first episode of RSV LRTI is associated with an increased risk of subsequent LRTIs. In addition, RSV is associated with recurrent wheezing in early childhood.[6]

Though risk factors such as prematurity and underlying conditions will increase the probability and severity of RSV infections in children, the majority of severe RSV outcomes occur in healthy fullterm infants. They represent the majority of ICU admissions (65.8%) and mechanical ventilation cases (59.8%) among RSV-infected infants, and globally, healthy infants account for around 57% of RSV-related deaths.[10-11] For this reason, all infants are at risk of RSV disease.

A single dose of Beyfortus® provides immediate and season-long protection, lasting for at least five months, corresponding to a typical RSV season[1]. In the MELODY phase III trial*, nirsevimab reduced medically attended RSV-LRTI by 74.5% and hospitalisations by 62.1% compared with placebo,[8] while the HARMONIE real-world study found an 82.7% reduction in RSV-related hospitalisations through 180 days after immunisation.[14] Beyfortus® demonstrated a consistent safety profile across term, preterm, and high-risk infants, with the most common adverse reactions being mild rash (0.7%), fever (0.5%), and injection-site reactions (0.3%).[1]

Beyfortus® has also demonstrated its strong public health impact in real-world settings. Following its introduction in 2024 in Chile and in 2023 in Galicia, Spain, the effectiveness of Beyfortus® against RSV-related LRTI hospitalisations was estimated to be 76.4% and 85.9%, respectively. In Chile, Beyfortus® demonstrated 49.7% effectiveness against all-cause hospitalisation.[12-13]

"RSV causes a great burden on families and the healthcare systems in South Africa and worldwide," says Diane Buron, South Africa Medical Head for Sanofi Vaccines. "It is a leading cause of infant hospitalisation during the season and Beyfortus® has the potential to change that. With only one dose, babies will be effectively protected throughout the season and thousands of cases and hospitalisations can be averted."

"Because the majority of RSV cases are in term and healthy infants," says Buron "proposing this innovative and effective protection to all infants will have a significant impact on the families and healthcare system."

*The Phase 3 MELODY trial was a randomised, double-blind, placebo-controlled trial conducted across 21 countries designed to determine the safety and efficacy of Beyfortus® against medically attended LRTD caused by RSV in healthy term and late preterm infants (35 weeks gestational age or greater) entering their first RSV season, including efficacy against severe disease such as hospitalisation, through 150 days after dosing. The primary endpoint was met, reducing the incidence of medically attended RSV LRTD by 74.5% (95% CI 49.6, 87.1; P<0.001) compared to placebo. The efficacy of Beyfortus® against the secondary endpoint of hospitalization was 62.1% (-8.6, 86.8). A pre-specified pooled analysis of the Phase 3 MELODY trial showed the efficacy of Beyfortus® against medically attended RSV LRTD and medically attended RSV LRTD with hospitalisation was 79.5% (95% CI 65.9, 87.7; P<0.0001) and 77.3% (95% CI 50.3, 89.7; P<0.001), respectively.

More than 6 million infants worldwide have now received Beyfortus®, supported by over 40 real-world studies across four continents, in both the Northern and Southern hemispheres. The introduction of Beyfortus® in South Africa is a significant advancement in paediatric respiratory protection and supports the global goal of reducing preventable infant morbidity and mortality linked to RSV.[8]

About Sanofi

Sanofi is an R&D driven, AI-powered biopharma company committed to improving people's lives and creating compelling growth. We apply our deep understanding of the immune system to invent medicines and vaccines that treat and protect millions of people around the world, with an innovative pipeline that could benefit millions more. Our team is guided by one purpose: we chase the miracles of science to improve people's lives; this inspires us to drive progress and deliver positive impact for our people and the communities we serve, by addressing the most urgent healthcare, environmental, and societal challenges of our time.

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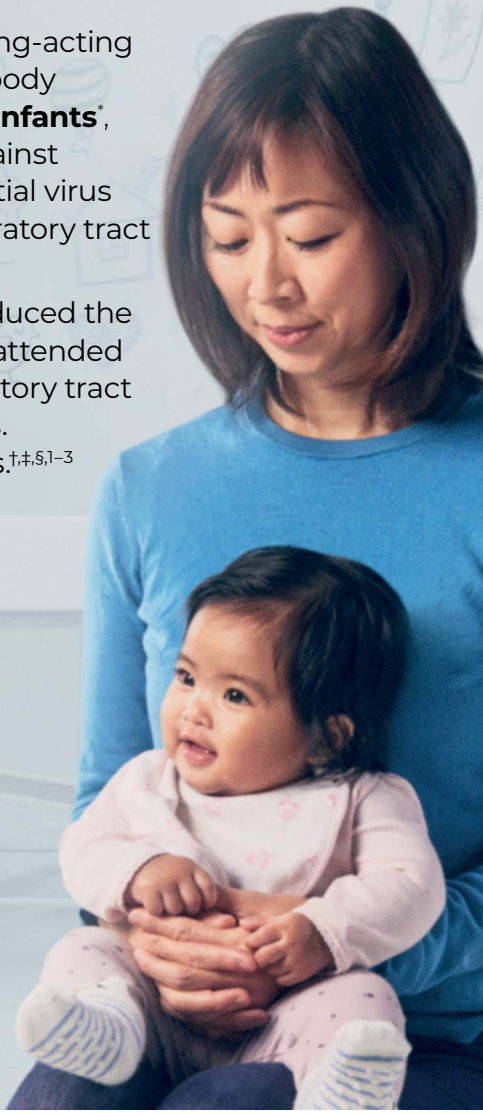

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‡ Based on results from two randomised, double-blind, placebo-controlled multicenter trials.[3] The primary endpoint was the incidence of medically-attended (MA) LRTI (inclusive of hospitalisation) caused by RT-PCR-confirmed RSV. Efficacy demonstrated through 150 days post injection.[1–3]

– **Phase 2b trial:** Study population included 1,453 very and moderately preterm infants (GA ≥29 to <35 weeks) entering their first RSV season. Infants received a single intramuscular 50 mg dose of Beyfortus™ (n=969) or placebo (n=484). Relative risk reduction (RRR) in MA RSV LRTI of 70.1% (95% CI: 52.3–81.2; p<0.001). Incidence was 2.6% with Beyfortus™ vs. 9.5% with placebo.[1,2] The types and frequencies of adverse events were similar for Beyfortus™ and placebo arms.[2]

– **Phase 3 MELODY trial (primary cohort):** Study population included 1,490 term and late preterm infants (GA ≥35 weeks) entering their first RSV season. Infants received a single intramuscular dose of 50 mg Beyfortus™ if <5 kg weight or 100 mg Beyfortus™ if ≥5 kg weight at the time of administration (n=994), or placebo (n=496). RRR in MA RSV LRTI of 74.5% (95% CI: 49.6–87.1; p<0.001). Incidence was 1.2% with Beyfortus™ vs. 5.0% with placebo.[1,3] The types and frequencies of adverse events were similar for Beyfortus™ and placebo arms.[3]

§ Adverse reactions reported in infants who received Beyfortus™ in clinical trials, were rash, injection site reaction and pyrexia. The frequency was uncommon (≥1/1,000 to <1/100).[1]

CI, confidence interval; **GA,** gestational age; **LRTD,** lower respiratory tract disease; **LRTI,** lower respiratory tract infection; **MA,** medically attended; **RRR,** relative risk reduction; **RSV,** respiratory syncytial virus; **RT-PCR,** reverse transcription polymerase chain reaction.

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Letter to the editor

Future-proofing pharmacy education: Aligning the curriculum for the Zalpha Generation

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Abstract

Health care is continually and rapidly evolving and it has become obvious that the pharmacy education system needs to be urgently reassessed.

In this editorial paper we express the belief, as the profession seeks to future-proof itself, that the pharmacy curricula need to turn away from traditional informative learning towards flexible, digital knowledge, and competency-based education, designed to accommodate the needs of the Zalpha Generation across the globe.

Keywords: pharmacy education, Zalpha Generation, curricula

https://doi.org/10.36303/SAPJ.3963

Dear Editor,

I am writing to draw attention to the changing technology, health care, and healthcare issues that require an immediate reassessment of pharmacy education for the pharmacy curriculum of the Zalpha Generation by researchers and policymakers worldwide.

To remain relevant, pharmacy education must produce graduates equipped with future-ready skills and the capacity for lifelong learning.[1] Generation Zalpha describes anyone born between 1995 and 2009, and Generation Alpha describes anyone born from 2010 to 2024. These groups possess distinct characteristics which influence learning preferences and competencies that challenge the traditional core curriculum.[1-3] Educators now face the challenge of designing curricula and teaching strategies for Gen Alpha, who were all born in the 21st century, and face challenges in designing higher education.[4] Both Generation groups have now reached our higher education institutions, and pharmacy education must adapt to the new learning outlines expressed in learning styles, digital literacy, and developing healthcare needs.

Worldwide, pharmaceutical care and pharmacy education have significantly improved through the integration of digital technologies into patient care and the teaching process.[5] Therefore, these learner groups must be engaged with an appealing, interactive, and progressive curriculum; an interactive and progressive pharmacy curriculum is a reality that pharmacy educators cannot ignore.

Despite the speed of advancement in health care and education systems, most curricula in national and international pharmacy schools remain outdated, emphasising enlightening teaching and knowledge gathering at the cost of digital literacy, revolution, and competency-based education. Current teaching methods are misaligned with Generation Zalpha's need for interactive, tech-enabled, global learning. This curriculum gap risks undermining the preparedness of future pharmacists for sophisticated health care and societal expectations.[1,6]

Pharmacy curricula for Zalphas must balance science with clinical practice, integrating digital health, Artificial intelligent (AI), and pharmacogenomics.[5] There is a need to foster innovation, entrepreneurship, and sustainability while centring on ethics and social accountability for non-traditional employment.

Effective learning and engagement for this generation require active, student-directed teaching. Hybrid or blended learning models, gamification, virtual and augmented reality simulation, and problem and team-based learning offer the promise of greater engagement and retention. Interprofessional education, micro learning units, and adaptive digital platforms foster communication, collaboration, and

critical thinking skill attainment. Performance practice requirements to shift from high-stakes testing to competency-based testing, e-portfolios, digital badges, and AI-supported simulation, with the potential for ongoing, formative feedback pegged to professional competencies.[5,7]

Along with teaching and curriculum content, support systems are also a determining factor for Zalpha students. Ensuring mental health services, flexible pathways, and individualised career planning fosters well-being and academic success in the students.[7-9] Thus, pharmacy curricula must be adaptive and collaborative, developed efficiently through regular collaboration with industry, regulators, accreditors, and patients, emphasising innovation, equity, and sustainability.

Finally, the pharmacy curriculum must be rationalised to meet future medical and healthcare demands. It must be technology-based but human-oriented, harmonising science and worldview. We appeal to educators, accreditors, and policymakers to immediately revise curricula to prepare the next generation of pharmacists.

Conflicts of interest

The authors have no conflicts of interest.

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Letter to the editor

Time to entrust? Rethinking pharmacy intern assessment in South Africa

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Abstract

Background: An essential component of the pharmacist internship is to establish whether the intern is competent to practise independently. In South Africa, this decision is based on multiple assessments: examination, portfolio of evidence, and progress reports. Globally, there has been development and adoption of Entrustable Professional Activities (EPAs) to assess both pharmacy students and interns in the workplace. This letter reviews assessments for pharmacy interns in South Africa, discusses the use of EPAs in pharmacy education, and argues for their integration as a means to enhance the structure, consistency, and future-readiness of the existing framework.

Methods: This letter does not employ a specific methodological approach. It reviewed the current assessment framework used by the South African Pharmacy Council to evaluate pharmacist interns and compared these to EPAs used in pharmacy education.

Findings: The current assessment framework, based on competency principles, lacks a structured and prospective mechanism to determine the interns' readiness for independent practice. Literature has shown that EPAs have been used successfully internationally to longitudinally evaluate the competency of pharmacy students and interns to complete profession-based activities in the workplace. EPAs have demonstrated applicability in evaluating clinical reasoning and decision-making through the assigning of a level of entrustment for specific clinical tasks.

Conclusion: The structured pharmacy internship model in South Africa provides a strong foundation for piloting EPAs. Given the dearth of local information, this letter calls for the development and piloting of EPAs to assess pharmacy workplace competencies.

Keywords: entrustable professional activities, pharmacy internship, competency assessment, South Africa, workplace-based assessment

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Introduction

The primary objective of the pharmacy internship is to determine whether the intern can effectively apply their academic knowledge and practical skills within a pharmacy setting, ultimately demonstrating readiness for independent professional practice. In South Africa, this is formalised through a mandatory one-year internship, which pharmacy graduates must complete before qualifying for registration as community service pharmacists. Many countries across the globe assess readiness to practice before permitting the graduate to work independently.[1] A variety of assessment methods have been used to evaluate competency and have included written, oral, and objective structured clinical examinations. However, no "gold standard" for assessment emerged, resulting in variability in intern readiness, lack of standardisation, or tutor subjectivity. Despite the structured nature of South Africa's internship programme, current assessments may lack the prospective, workplace-based insight needed to ensure consistent readiness for practice. Another method of assessing competency is through Entrustable Professional Activities (EPAs).

EPAs have gained traction in medical education, where it has been extensively explored to help supervisors in deciding if students are ready to work independently.[2] The uptake of EPAs in pharmacy education has been explored within the last decade, where they were first implemented by the University of Minnesota College of Pharmacy in the assessment of pharmacy practice.[3] Since then, EPAs have been used extensively in the assessment of students' and interns' readiness to practice independently.[4,5] In South Africa, there are no studies published, although one is being undertaken at the University of the Witwatersrand, that have explored the EPAs in the South African context, including in the training of undergraduate pharmacy students. This letter reviews the current assessments used for pharmacy interns in South Africa, discusses the use of EPAs in pharmacy education, and argues for their integration as a means to enhance the structure, consistency, and future-readiness of the existing framework.

Assessments of pharmacist interns in South Africa

In South Africa, Bachelor of Pharmacy (BPharm) graduates are required to complete a minimum of 365 days of practical training under the direct supervision of a tutor. During their internship, interns are evaluated via three mechanisms: pre-registration examination, Portfolio of Evidence (PoE), and progress reports[6] (Table I).

Table I: Overview of the evaluation of the internship[6]

	Examination	Portfolio of Evidence (PoE)	Progress reports (PRs)
Description	An online examination comprises 120 multiple-choice questions (MCQs), divided into two sections: 40 calculations and 80 general practice.	A PoE comprises six entries submitted online, based on continual professional development entries completed by pharmacists.	Progress reports are completed by the tutor based on observations from the workplace.
Proof of competency	Pass both sections of the exam in the same sitting: • Calculations 60% • General practice 50%	Successful in all six entries.	Favourable progress reports. The number of PRs depends on the sector of registration.
Basis of assessment	Entry-level criteria for newly qualified pharmacists are described in the Competency Standards for Pharmacists in South Africa.		Questionnaires are developed by the SAPC.
Additional criteria apply to interns completing their internship in academia, the manufacturing, and wholesale sectors.			

Both the pre-registration and PoE are based on the competency framework, which identifies six domains and is associated with defined competencies:

1. Public health
2. Safe and rational use of medicines
3. Supply of medicines and medical devices
4. Organisation and management skills
5. Professional and personal practice, and
6. Education, research, and critical analysis

The blueprint of the pre-registration examination distributes questions across the six domains, covering the majority of the competencies listed.[6] In the PoE submissions, interns are required to submit one entry per domain, keeping in mind that it is compulsory to complete the competency relating to ethical and legal practice.[6] Criteria for the assessment of the PoE are defined according to the four steps outlined in the continual professional development (CPD) cycle. The tutor, an experienced pharmacist, completes progress reports assessing the intern in the work environment when observing their competence, knowledge, and attitude.[6] The method of assessment is determined by the tutor and may include direct observation, simulation, evaluation of case studies, and oral questioning. However, the assessments may be subjective, where the intern is judged competent or not, according to the tutor's satisfaction.

Brief overview of entrustable professional activities

Medical education has evolved over time to focus on assessing competency, where the supervisor of trainees trusts the ability of the trainee to perform specific professional tasks. Ten Cate[2] described EPAs as clearly defined, measurable activities or tasks that are performed by qualified professionals within a specific timeframe and grounded in core competencies. EPAs are not intended to replace competencies, but provide a means to evaluate them in practice.[2] EPAs are not evaluated using traditional grading methods such as marks or percentages. Instead, they are assessed through levels of entrustment, which reflect the degree to which a tutor is confident in the intern's ability to perform a professional activity and the extent of supervision required. This provides a more nuanced and practical measure of readiness for independent practice.[2]

Entrustable professional activities in the context of pharmacy

The discussion of incorporating EPAs in pharmacy practice was introduced almost ten years ago, when the advanced pharmacy practice curriculum was initially introduced in the United States to evaluate competencies in the workplace,[3] including incorporation into the training of pharmacy students.[7] For example, the level of entrustment in a pharmacy student ready to commence experiential training would be low, as the student may have only recently gained the knowledge components without practical application; thus in the workplace, they are at first only permitted to observe the pharmacist. In contrast, a supervisor would entrust more tasks, such as dispensing medication and counselling of the patient, to a student nearing the end of the qualification under their direct supervision. The American Association of Colleges of Pharmacy (AACP) developed a set of Core EPAs to guide pharmacy education and experiential learning.[8] Since their development by the American Association of Colleges of Pharmacy (AACP), the Core EPAs have been widely adopted across the USA pharmacy schools as a foundational framework for assessing student readiness for practice, guiding experiential learning, and aligning educational outcomes with real-world professional expectations. Richardson[9] discusses how EPAs are being used in the UK to support trainee pharmacists during clinical placements, especially in light of their expanded role, such as prescribing. The application of EPAs in pharmacy has extended into internship programmes.

Australia has developed 14 validated, implemented, and evaluated EPAs for pharmacist interns based on the competency framework for pharmacists in Australia.[4,5] Using a validation tool, they determined the degree to which the EPAs were (i) "discrete units of work", (ii) entrustable, essential, and important tasks of the profession" and (iii) "curricular role" described by a panel of experts who were pharmacists from community, hospital and academia.[5] The finalised EPAs were implemented, where the preceptor (tutor) assesses the interns at four pre-determined timepoints and assigns a level of entrustment varying from "Observe only, even with direct supervision" (Level 1) to "supervise at a distance and/or post hoc" (Level 4). An initial cohort demonstrated that across all EPAs, there was a progression in the level of entrustment assigned by the preceptor, indicating their suitability in assessing competency in the workplace.

The Australian Pharmacy Council[10] present EPAs as an evidence-based approach to determine readiness for practice as a pharmacist, where they will need to make decisions autonomously. Compared to traditional assessment methods, EPAs offer a structured approach to evaluating intern readiness. Rather than relying solely on observed performance, EPAs incorporate reflective feedback sessions where the supervisor probes the intern's understanding of potential risks, complications, and alternative approaches. This deeper engagement enables a more comprehensive assessment of clinical reasoning, decision-making, and adaptability, key attributes for independent practice.

Proposed integration within the assessment framework for pharmacist interns in South Africa

The current assessment framework for pharmacy internship in South Africa provides three distinct components, which are all based on either the competency framework or assessing competency. Although there is a strong emphasis on evaluating competence in the current framework, one needs to question whether these assessments are still fit-for-purpose. To our knowledge, there is no published literature that has evaluated the assessment framework.

The current assessment framework, while grounded in competency-based principles, lacks a structured, prospective mechanism to evaluate readiness for independent practice. EPAs offer a validated, workplace-based approach that complements existing assessments by providing a more nuanced, longitudinal view of intern development. Given the global momentum and demonstrated success of EPAs in pharmacy education, we strongly recommend that academic institutions and the South African Pharmacy Council initiate pilot studies to explore the integration of EPAs as a mechanism to assess competency in the workplace, and in particular the internship programme. This shift would not only enhance the objectivity and consistency of intern evaluations but also ensure that graduates are truly prepared to meet the demands of independent professional practice. South Africa's existing competency framework and structured internship model provide a strong foundation for piloting EPAs. Their integration could enhance the reliability, transparency, and future-readiness of intern assessments.

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President's Message

Dear Colleagues

As we enter 2026, I do so with a strong sense of optimism for our profession. The past year was demanding. We faced supply challenges, regulatory pressures, and the ongoing reality of serving our communities in a difficult economic climate. Yet, despite this, pharmacists across South Africa stood firm. Our strength lies not only in endurance, but in our shared commitment to patients and to one another.

South African pharmacists do far more than dispense medicines. Every day, we provide solutions, reassurance, and continuity of care. That spirit of resilience and service defines our profession and remains central to the work of the PSSA. We have consistently shown that challenges are not obstacles, but opportunities to lead.

This was clearly demonstrated through PiMaRT. South African pharmacists possess world-class skills and are well-positioned to expand their role in healthcare delivery. The successful court case, which confirmed our right to provide these services, was a major milestone. As we await full implementation, the significance is clear: improved access to care, including faster access to HIV treatment, and meaningful relief for an overstretched health system. When pharmacists are empowered to practise to the full extent of their training, patients and communities benefit.

The same determination was evident during the intern placement challenges this year. Rather than disengaging or resorting to public frustration, the PSSA worked directly with the government to find practical solutions. At the same time, members stepped up by sharing opportunities, offering guidance, and mentoring interns. This collective effort reinforced our role in strengthening the healthcare workforce and supporting the next generation of pharmacists.

Resilience is also seen in the everyday actions of individual pharmacists. A recent example from a Cape Town community pharmacy illustrates this well. Faced with a medicine stock-out and unable to reach the prescriber by phone, the pharmacy team took responsibility. A pharmacy assistant walked down the road to the doctor's rooms, explained the situation in person, and secured an alternative prescription. That simple but determined action ensured uninterrupted care for a vulnerable patient. These stories are not rare; they happen daily across the country.

Pharmacists are problem-solvers. We act where others hesitate, close gaps in care, and earn the trust of the communities we serve. These efforts, taken together, reflect the true character of our profession.

As your professional body, the PSSA remains committed to advocating for you, supporting professional development, and strengthening our collective voice. Our contribution to society is significant: improving medicine use, preventing harm, promoting wellness, and advancing equitable access to healthcare.

As we move through 2026, I encourage you to remain positive and united. Support one another, innovate where possible, and hold fast to the spirit of Ubuntu that underpins our work.

I extend my warmest wishes to you and your families for a healthy, successful, and fulfilling year ahead. Importantly, 2026 also marks 80 years of the Pharmaceutical Society of South Africa. This milestone year will be one of reflection, pride, and celebration on many levels, as we honour our past and look confidently to the future.

Warm regards

Renier Coetzee
PSSA President

The evolution of the Pharmaceutical Society of South Africa (1946–2026)

Custodians of a profession: The Pharmaceutical Society of South Africa at 80

In a rapidly changing professional landscape, where organisations often struggle to remain relevant beyond a generation, the Pharmaceutical Society of South Africa (PSSA) stands out as a resilient and enduring institution. As the Society marks its 80th anniversary this year, it reflects not only longevity but also sustained leadership, adaptability, and an unwavering commitment to advancing pharmacy in the public interest.

Organised pharmacy in South Africa predates the formal establishment of the PSSA by several decades. In the late nineteenth and early twentieth centuries, pharmacists began forming provincial and regional bodies to protect professional standards, promote ethical practice, and advocate for autonomous regulation. These included the South African Pharmaceutical Association in the Eastern Cape, the Cape Pharmaceutical Society in the Western Cape, and the *Het Pharmaceutisch Genootskap van de Zuid-Afrikaanse Republiek*, later known as the Transvaal Pharmaceutical Society. While geographically dispersed, these early organisations shared a common purpose: to professionalise pharmacy and safeguard its scientific and ethical foundations within a rapidly modernising society.

A decisive step towards national collaboration came in 1924 with the formation of the Associated Pharmaceutical Societies of South Africa. Among its most enduring contributions was the establishment of the *South African Pharmaceutical Journal* (SAPJ) in 1934. Conceived as a platform for professional communication, debate, and cohesion, SAPJ helped unite pharmacists across regions and practice settings, fostering a shared professional identity.

Nearly a century after its founding, the SAPJ remains one of the longest-running professional journals in South Africa and a defining pillar of the PSSA's intellectual and professional legacy. Since its first publication in 1934 under the stewardship of the PSSA, SAPJ has served as the enduring voice and intellectual heartbeat of the pharmacy profession, chronicling its scientific progress, policy debates, and evolving practice. The journal's confirmation on the Department of Higher Education and Training's (DHET) accredited Scopus list in 2024 represents a landmark achievement in the PSSA's 80-year journey, affirming decades of scholarly leadership while projecting South African pharmacy knowledge confidently into the global academic arena.

The PSSA was formally inaugurated on 1 January 1946, incorporating eight constituent societies under a single national body. From its inception, the PSSA adopted an inclusive membership model, welcoming pharmacists across all sectors of practice. Its founding governance structure carefully balanced central coordination with branch autonomy, enabling the Society to speak with a unified national voice while remaining responsive to regional realities. This model proved instrumental in establishing the PSSA as the authoritative professional body for pharmacy in South Africa.

The PSSA's identity is powerfully expressed through its registered emblem. More than a decorative symbol, the emblem reflects the Society's values and purpose. National symbolism is interwoven with the core elements of pharmacy: learning, science, professional practice, and social responsibility, affirmed by the motto *Pro salute et bono populi*: *for the health and well-being of the people*. Together, these elements sum up who the PSSA is, what it stands for, and how it understands its role within South African society and the profession's future.

As pharmacy practice diversified in response to scientific advances and health system needs, the PSSA recognised the importance of structured sectoral representation. Over time, specialist groupings were established and incorporated into the Society's broader framework, including:

- The South African Chemists' and Druggists' Protection Association (1946) later renamed the South African Association of Community Pharmacists (SAACP) around 2015.
- The South African Association of Hospital and Institutional Pharmacists (SAAHIP) (1957)
- The Academy of Pharmaceutical Sciences of South Africa (APSSA) (1979)
- The South African Association of Pharmacists in Industry (SAAPI) (1995)

These developments reflected the growing complexity of pharmacy practice and ensured that diverse professional perspectives informed PSSA policy, advocacy, and strategic direction.

The PSSA has long recognised that the future of the profession depends on meaningful engagement with pharmacy students. Following the establishment of the South African Pharmacy Students' Federation (SAPSF) in 1953, the PSSA progressively

acknowledged SAPSF as the representative voice of pharmacy students. Over time, this relationship evolved into a structured partnership, with SAPSF leaders participating in PSSA platforms and national professional conversations. Many have since transitioned into leadership roles within PSSA structures, reflecting a strong intergenerational continuum.

Central to the PSSA's mission has been sustained investment in people. The establishment of the Foundation for Pharmaceutical Education (FPE) marked a significant commitment to supporting students and young professionals through bursaries and educational assistance, strengthening access to the profession and promoting equity. To date, the Fund has awarded over 1000 bursaries nationwide, with beneficiaries frequently attesting to its transformative impact on their professional journeys.

The formation of the Young Pharmacists' Group (YPG) in 2014 further reinforced this commitment. The YPG has created a dynamic platform for early-career pharmacists to engage in leadership development, professional advocacy, and innovation, and has become an important pipeline for future leaders within the Society.

Recognising the importance of institutional memory, the PSSA played a pivotal role in establishing the Pharmacy Museum in 1954, initially administered by the Southern Gauteng Branch. The Museum preserves artefacts, documents, and narratives that trace the evolution of pharmacy practice in South Africa, serving both as a historical repository and an educational resource. In 2024, much of the Museum's administration was transferred to the PSSA National Office, strengthening its national character. The Museum is now a fully-fledged Section 21 not-for-profit company, a development welcomed as a major step in safeguarding the profession's heritage for future generations.

By the late 1990s, evolving professional dynamics and tensions between regional and sectoral participation necessitated constitutional reform. Following extensive consultation, a new PSSA Constitution was adopted at a Special General Meeting on 19 November 1999. The revised Constitution formally recognised both regional and sectoral branches and restructured leadership to ensure more inclusive governance. SAPJ at the time described the new Constitution as "one for all and all for one," capturing its spirit of unity and renewal.

As pharmacy became increasingly globalised, the PSSA expanded its international engagement. The Society was among the inaugural members of the African Pharmaceutical Forum (APF) in April 2004, contributing to continental collaboration and professional solidarity. Long-standing membership in the International Pharmaceutical Federation (FIP) and active participation in the Commonwealth Pharmacists Association (CPA) further positioned South African pharmacy within global professional discourse. These international affiliations have not only strengthened knowledge exchange, policy alignment, and professional collaboration but have also showcased South African pharmacy on the global stage. This culminated in the CPA biannual conference in Durban in 2011, and the 82nd FIP World Congress in Cape Town in 2024, a historic first for Sub-Saharan Africa in FIP's 112-year history, highlighting the PSSA's enduring role as a leader and custodian of the profession both nationally and internationally.

As the PSSA marks 80 years of service to the profession, transformation stands as a defining thread linking its proud legacy to its future ambitions. True to its founding purpose, the PSSA continues to broaden participation, opening pathways to leadership, ownership, and opportunity across the profession. Through sustained advocacy and policy engagement, the Society has played a meaningful role in medicines policy, workforce development, and responses to major public health challenges, including HIV/AIDS and the COVID-19 pandemic. At the same time, it has embraced the evolving scope of pharmacy, championing roles in public health, pharmacist specialisation, digital innovation, and entrepreneurship. Guided by its 2025–2030 strategic vision and aligned with international frameworks, the Society focuses on inclusivity, innovation, and member needs, and on building stronger relationships with branches, sectors, and the public, viewing members as co-designers of the future. Central to this journey is a commitment to representation and inclusivity, ensuring that the PSSA reflects South Africa's multiracial, multicultural, and gender-diverse society, while nurturing leadership across generations. In this way, the PSSA's transformation agenda honours eight decades of stewardship while actively shaping a resilient, engaged, and impactful future for the pharmacy profession.

At 80 years, the PSSA remains the authoritative voice of pharmacy in South Africa. As the profession confronts rapid technological change, evolving scopes of practice, and the emergence of artificial intelligence, the Society's role as custodian of professional ethics, standards, and public trust is more critical than ever. Ultimately, the PSSA's greatest achievement lies not only in its structures, affiliations, or milestones, but in the generations of pharmacists, pharmacy support personnel, and students who have upheld professional excellence in the service of society. As the PSSA celebrates eight decades of service, it does so with deep respect for its past and a clear responsibility to the future.

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Pharmacist and Public Perspectives on Smoking Cessation Services in South African Community Pharmacies

Jodiane Benade

Master's in clinical pharmacy candidate, University of the Western Cape

Jodiane is the runner-up of the YPG Professional Innovation Project 2025

My name is Jodiane Benade, and I am a Master's in Clinical Pharmacy candidate and academic intern at the University of the Western Cape in Cape Town. Over the past year and a half, I have been working in a district hospital where I have witnessed, time and again, the devastating impact that smoking has on patients and their families. Every day, I see lives shortened, the quality of life diminished, and hospital beds filled with individuals suffering from conditions that could have been prevented.

One of my most admirable lecturers always reminded us that "clinical pharmacy is a public health matter", and I could not agree more. It is in the day-to-day encounters with patients- struggling to breathe because of chronic obstructive pulmonary disease, patients battling recurrent strokes linked to smoking, families losing loved ones too soon - that this statement has taken root in me. These are not just clinical cases; they are people whose lives and futures are profoundly altered by a habit that is both preventable and treatable.

Standing at the intersection of pharmacy, healthcare, and public health, I feel a strong responsibility to do more than dispense medicines. I want to address the upstream causes of illness, and smoking cessation is one of the most powerful ways to change the health trajectory of individuals and communities. This project is my first step toward that vision.

Working in a district hospital has opened my eyes to the reality of how deeply smoking-related illnesses affect people in South Africa. It is one thing to read statistics in a report, but it is entirely different to stand at a patient's bedside and witness the toll firsthand. Many of them are not elderly, as one might expect, but in the prime of their lives: parents, breadwinners, and young adults with decades ahead of them. What strikes me most is not only the patients' suffering but also the ripple effect on their families and communities. Smoking does not just rob individuals of their health; it drains households of income, destabilises communities, and places a heavy strain on our healthcare system.

What is even more painful is knowing that many of these outcomes are preventable. Yet, despite the apparent need, structured support for people who want to quit smoking remains scarce. Patients often leave the hospital with medicines to manage their conditions, but very few resources to address the root cause of their illness. For me, this gap represents not just a professional challenge but a personal call to action.

Pharmacists hold a unique place in the healthcare system. Unlike many other professionals, we are often the first point of contact for people in their communities. Patients see us not only for medicines, but also for advice, reassurance, and guidance. That accessibility creates countless opportunities to intervene early, to start conversations that could change lives, and to bridge the gap between intention and action when it comes to quitting smoking.

I believe pharmacists are particularly well-suited to deliver smoking cessation support because we combine clinical knowledge with daily interactions. We understand both the pharmacological aids that can help patients quit and the human behaviours that make quitting so difficult. In countries around the world, pharmacist-led smoking cessation services have proven successful, and I believe South Africa can and should move in that direction.

On a personal level, this project represents much more than a research study. It is the beginning of the kind of work I see myself dedicating my career to, connecting clinical pharmacy with preventive care and public health. I am motivated not only by what I have seen in hospital wards, but also by the vision of a healthier country where pharmacists are empowered to do more than dispense medicines.

For me, this is about answering the question: what can I do, with the skills I have, to make the most significant difference? This project is my first step in responding to that call; to serve, to innovate, and to show how pharmacy can be a force for change in South Africa.

This project is designed to be a starting point, a stepping stone toward something bigger. At its heart, it is about listening, listening to pharmacists about what they need to provide smoking cessation services, and listening to members of the public about what kind of support they would use. Too often, health interventions are designed without a complete understanding of the people they are meant to serve. I hope that by capturing these perspectives, we can begin to shape a service model that is both practical for pharmacists and meaningful for patients.

Part of this project will also involve creating simple, co-designed educational materials to help patients understand their options for quitting. Something as small as a clear, supportive leaflet can plant a seed of change in someone's mind. Alongside this, identifying training needs for pharmacists and pharmacy staff will help build a stronger foundation for smoking cessation services in both public and private settings.

The impact of smoking cessation goes far beyond the individual. A patient who quits not only adds years to their life but also reduces financial strain on their household, sets an example for their children, and eases the burden on our healthcare system. In this way, each successful quit attempt becomes part of a larger ripple effect, improving the health and well-being of families, communities, and ultimately, our nation.

This project is more than an academic requirement; it is deeply personal. Every time I walk through the hospital wards, I am reminded of why I chose this profession: to help people live healthier, fuller lives. Seeing preventable suffering has left a mark on me, and I feel a responsibility to act. This project is my way of turning that ache in my heart into action, and of showing that pharmacists can and should play a bigger role in addressing public health challenges.

On a professional level, this work aligns with the kind of pharmacist I aspire to become: one who is not only clinically competent but also innovative, compassionate, and forward-thinking. I see this project as the foundation for a career devoted to bridging the gap between pharmacy and public health, between treatment and prevention, and between patients' needs and the services available to them.

I know that one project cannot solve all the challenges surrounding tobacco use in South Africa. But I also believe that every change starts with a small step. If this work sparks conversations, shapes pharmacist training, or gives even one patient the tools to quit smoking, it will already have been worthwhile.

Ultimately, this project represents hope. Hope for patients, for families, and for future generations. It is my way of contributing to a healthier South Africa, one where pharmacists stand on the frontlines of prevention and every person has the chance to live free from the burden of tobacco.

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Chronic gout: a review of approaches to treatment

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Abstract

Gout is an inflammatory disorder characterised by joint immobility due to monosodium urate crystals deposits. The prevalence of gout is increasing owing to several factors, including dietary patterns, cardiometabolic disorders, and certain medications, amongst others. Central to gout pathophysiology is the accumulation of uric acid, which subsequently forms monosodium urate crystals, which can deposit in joints, forming tophi and instigating the inflammatory process and pain. The diagnosis and monitoring of gout include synovial aspiration, imaging tools, and plasma uric acid measurement. Nevertheless, some of the detection tools present several drawbacks, therefore necessitating innovative developments towards detection and monitoring approaches. From a therapeutic standpoint, the goal is to relieve pain and inflammation and maintain desired plasma uric acid levels. Therefore, the pharmacological interventions include a variety of modalities such as NSAIDs, corticosteroids, xanthine oxidase inhibitors, and drugs aiming to promote renal excretion of uric acid. Despite the availability of these treatment approaches, however, gout management remains a challenge, necessitating strategic innovative approaches. A heightened understanding of uric acid metabolism presents opportunities for visualisation and development of efficacious treatment approaches for gout. Furthermore, use of technological advancements in drug formulation strategies, such as nanoparticles, can offer additional avenues to improve gout management. The incorporation of pharmacogenetics is envisaged to also improve the prognosis of gout, through strides aiming to personalise gout management. Lastly, improved patient education on gout management can yield positive outcomes.

Keywords: chronic gout, hyperuricaemia, monosodium urate, urate-lowering therapies, novel therapies

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Introduction

Chronic gout is a progressive disease caused by the deposition of monosodium urate crystals and hyperuricaemia; it is the most common inflammatory arthritis.[1] Chronic gout is characterised by persistent inflammation of the joints, formation of tophi, bony erosions, and progressive cartilage damage.[2] Chronic gout is highly prevalent in the elderly and occurs more commonly in men over the age of 40, who are reported to be approximately twice as likely to develop the condition compared to women. Results from a global disease burden study estimated that 55.8 million people were diagnosed with gout.[1,3]

The prevalence of gout is attributed to various risk factors such as ageing, use of certain prescription medicines, dietary and lifestyle changes, and rising burden of comorbid conditions.[1] Recurrent attacks of gout are associated with the consumption of alcoholic beverages such as beer and wine. Medications that are associated with increased risk of gout include angiotensin-converting enzyme inhibitors, diuretics, cyclosporine, and β-blockers. Gout is associated with several comorbid conditions such as diabetes, renal disease, hypertension, and hyperlipidaemia.[4] Chronic gout treatment is aimed at preventing gout flares, reversal of tophus formation and reducing urate deposition. The mainstay treatment is the use of uric acid-lowering agents, first-line treatment consists of xanthine oxidase inhibitors with second-line treatment including uricosuric agents. Advances in chronic gout treatment have been focused on improved newer uric acid-reducing agents such as febuxostat and pegloticase and novel anti-inflammatory agents such as canakinumab.[5]

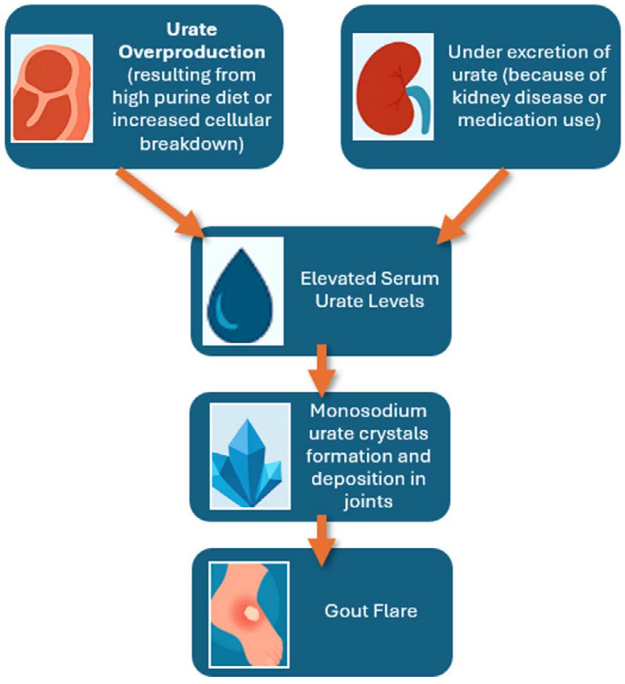

Figure 1: Schematic presentation of the pathophysiology of gout[6,8]

Pathophysiology of gout and progression to chronic disease

Pathophysiology progression of gout begins with hyperuricaemia, the primary risk factor for gout. Hyperuricaemia arises from an imbalance in uric acid production and excretion.[6] Under normal

conditions, purines from diet or from catabolism of nucleic acids are converted to hypoxanthine. Hypoxanthine is metabolised by the enzyme xanthine oxidase to uric acid.[7] This is ultimately excreted in urine.

Hyperuricaemia results from decreased excretion or increased production of uric acid. Decreased excretion of uric acid occurs due to chronic kidney disease, acute kidney injury, hyperparathyroidism, dehydration, or use of medications like diuretics, aspirin, and ciclosporin.[6] On the other hand, overproduction of uric acid results from high purine diet (e.g. red meat, seafood and fructose-rich beverages) and increased cellular turnover and breakdown (as seen in conditions such as tumour lysis syndrome and psoriasis).[6] Often, hyperuricaemia stems from mixed causes including obesity, metabolic syndrome, genetic predisposition, and hormonal factors.[6,8]

At a physiological pH of approximately 7.4, uric acid loses a proton, forming urate ions, which bind to abundant extracellular sodium to form monosodium urate.[9] This compound has limited solubility in body fluids, and when serum uric acid levels exceed the solubility threshold (~6.8–7.0 mg/dL), crystals can precipitate. Factors such as low temperatures, local pH changes, and cartilage composition promote crystal formation, which often occurs in peripheral joints like the first metatarsophalangeal joint (podagra).[9] Initially, even with crystal deposition, an individual can be without symptoms due to protective protein layers shielding the crystals from immune detection. Most people at this stage never develop gout.[6]

Clinical presentation and diagnosis

Gout typically progresses from acute gout attacks to chronic gout. In the acute phase, patients often develop sudden, severe pain with noticeable swelling and redness of the affected joint, tendon or bursa. Chronic gout, which results from recurrent gout attacks, is associated with chronic mono- or poly-articular inflammation, tophus formation, deposition of monosodium urate crystals, cartilage damage, which ultimately cause bone erosion and destruction of the joint. Chronic gout involving multiple joints can cause significant debilitation.[10,11] Tophaceous gout, a severe form of gout, may develop in patients after several years of recurrent gout attacks and in patients with untreated chronic gout.[4,12] Tophi formation usually occurs within or around the joints and may also involve subcutaneous deposition. Tophi commonly form large masses in locations such as fingers, knees, elbows, helices of the ear and the first metatarsophalangeal joints.[11] A study by Bieber et al. highlighted two single clinical cases studies of patients who presented with chronic tophaceous gout without previous gouty attacks which reflected that in rare cases chronic gout manifests initially as tophi.[11] Joint aspiration is considered the gold standard diagnosis, as it is more reliable in confirming gout through microscopic analysis of synovial fluid for the presence of monosodium urate crystals. However, joint aspiration is not always feasible and easily accessible; it is therefore less commonly used in clinical practice.[4] Hyperuricaemia on its own is not sufficient for a confirmative gout diagnosis. The diagnosis of gout can be supported by clinical features such as elevated serum uric acid levels, erythrocyte sedimentation rate or C-reactive protein, podagra and specialised imaging modalities.[4,13] X-rays are easily accessible and more beneficial in chronic gout than in the early stages of gout. In the early stages of gout, radiographic findings show soft-tissue inflammation and offer very little diagnostic value. Despite its low sensitivity, radiography is useful in the diagnosis of gout that has progressed. Radiographic findings that can be seen in chronic gout include, marginal or juxta-articular erosions with overhanging edges and the presence of dense tophaceous nodules within soft tissues.[4] Ultrasound (US) is a valuable tool in chronic gout, as it can reveal tophi that may not be seen on a physical exam and detect the "double contour" sign of urate deposits on the cartilage.[4,14] US can also detect joint effusions, inflammation of the synovium, small crystal deposits, and bone erosions, often before these changes are visible on X-rays.[4]

Computed tomography (CT) and dual energy computed tomography (DECT) are useful in chronic gout for detecting tophi and bone erosions, particularly in deeper joints. DECT can specifically identify urate deposits, quantify tophi, and detect subclinical disease, making it helpful when joint aspiration is not feasible. Conventional CT can show hyperdense nodules but cannot reliably distinguish urate from other crystals without DECT.[4]

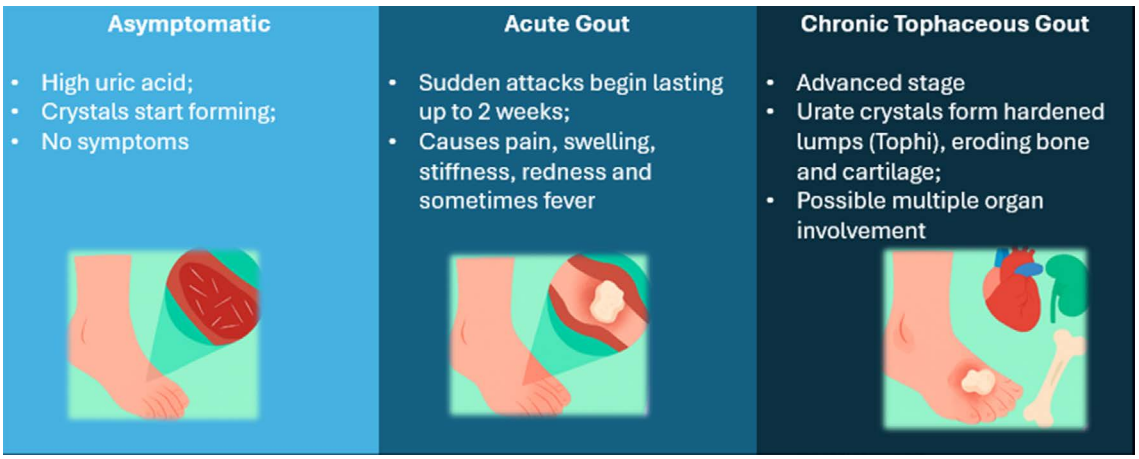

Figure 2: Overview of intermittent and tophaceous gout pathology and clinical presentation[6,7,9,10]

Treatment

Nonpharmacological treatment of gout

Nonpharmacological treatments for gout primarily emphasise dietary modifications, weight management, and complementary acute interventions.[15–17] Numerous studies have demonstrated that weight loss, achieved through diet, exercise, or bariatric surgery, can lead to a decrease in serum uric acid levels and a reduction in the frequency of gout flares.[15–17] In fact, some studies observed changes in serum uric acid ranging from -168 to +30 micromol/L, with 75% reporting a decrease in flare occurrences.[15] Other strategies, such as the application of topical ice, have been shown to provide significant pain relief, demonstrated by a mean difference of 3.33 cm on pain scales.[16] Conversely, the consumption of enriched skim milk powder and tea did not yield improvements in serum uric acid levels or flare frequency.[16] Furthermore, dietary patterns inspired by the Mediterranean, low-purine, or dietary approaches to stop hypertension (DASH diets) have been associated with lower serum uric acid levels and, in certain cases, a reduced incidence of gout flares.[17]

Pharmacological therapy

Gout attacks usually spontaneously resolve in approximately seven days without any treatment but the most important first intervention is the rapid removal of pain and inflammation.[18] The second level of intervention is the management of chronic gout arthritis by lowering serum uric acid levels.[19] Acute gout flares must be immediately treated using one or more anti-inflammatory drugs, viz., nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroids and/or colchicine as the first-line options.[20] This treatment should ideally start within 12–48 hours of onset of a gout flare.[9] All the listed anti-inflammatory drugs are effective, and selection should be guided by patient safety, taking into account existing comorbidities and potential contraindications.[21]

Analgesics and anti-inflammatory agents

Nonsteroidal anti-inflammatory drugs

NSAIDs act by inhibiting the enzyme cyclooxygenase (COX), thereby alleviating pain and inflammation.[22] Based on this mechanism, NSAIDs are classified into two main categories: non-selective COX inhibitors and selective COX-2 inhibitors.[22] The most frequently prescribed non-selective NSAIDs include ibuprofen, administered orally at 400 mg three times daily; indomethacin, administered orally at 50 mg three to four times daily; piroxicam, administered orally at 40 mg once daily for 4–6 days; and naproxen, given orally at an initial dose of 750 mg followed by 250 mg three times daily.[23,24] Etoricoxib is the only COX-2 selective inhibitor indicated for the management of gout attacks, administered orally at a dose of 90–120 mg once daily (for acute symptomatic treatment, maximum of eight days).[24] Van Durme et al. reported a 50% reduction in pain after 24 hours of treatment with NSAIDs. All NSAIDs are equally effective in treating acute flares; therefore, selection should be based on the patient's response and the severity of the side-effects.[23,25] COX-2 selective NSAIDs can alter renal haemodynamics, leading to salt and water retention, which may worsen hypertension and increase the risk of acute heart failure.[15] The use of NSAIDs should be limited to a maximum of 10 days or should be discontinued once both inflammation and pain have resolved.[26]

Alkaloids (Colchicine)

Colchicine essentially functions by disrupting the molecular pathology involved in the inflammatory response to urate crystal deposition in joint tissue.[18] Oral colchicine is prescribed at an initial dose of 0.5–1 mg followed by 0.5 mg every six hours, with a maximum daily dose of 2.5 mg.[23,24] In patients with moderate renal impairment (GFR 10–50 ml/min), the colchicine dose should be reduced by half. [24,27] In cases of severe renal impairment (GFR < 10 ml/min), colchicine should be avoided entirely.[27] Conjunctive use of colchicine with non-selective NSAIDs may increase the risk of gastrointestinal side-effects such as ulceration and haemorrhage.[22,24]

Corticosteroids

Corticosteroids are only administered orally if NSAIDs are poorly tolerated or contraindicated, such as in patients with peptic ulcer disease, those receiving warfarin therapy, or individuals with renal impairment, hypertension, or heart failure.[28] Oral prednisone or prednisolone is normally prescribed at 40 mg daily for five days.[24,28] Selecting the most viable treatment for an acute attack depends on the tolerance and comorbidities of the patient to avoid harsh side-effects and contraindications, respectively.

Serum uric acid-lowering agents

According to the American College of Rheumatology (ACR) guidelines, uric acid-lowering therapy must be initiated for all patients with one or more subcutaneous tophi or who have experienced one or two acute gout attacks in one year.[29] The aim of this therapy is to achieve and maintain serum uric acid levels below 6 mg/dL to prevent deposits, with monitoring every six months to guide treatment maintenance or adjustment as needed. In cases of severe gout, the European League Against Rheumatism recommends that uric acid levels should be lower than 5 mg/dL for patients with severe gout. Low serum levels of uric acid will ensure that urate crystals do not form, and joint inflammation is prevented.[25] Once the tophi and gout flares are resolved, uric acid-lowering therapy should continue indefinitely as a lifelong therapy.

During the initial weeks of therapy, patients may experience more frequent gout flares as tissue uric acid deposits are mobilised in response to the sudden reduction in serum levels.[30] Hence, uric acid-lowering therapy should be initiated at a low dose and gradually increased, accompanied by low-dose colchicine or an NSAID for the first six months to prevent gout flares. Furthermore, uric acid-lowering drugs should not be initiated during an acute gout attack, however, if the patient is already on such therapy at

Cipla

Colchicine Houdé

Colchicine 1 mg

INDICATIONS[1]

Colchicine Houdé is for the emergency treatment of acute gout.

Fluxes in uric acid concentrations induce an inflammatory cascade that manifests as an acute gout flare[2].

Adopting a healthy lifestyle can go a long way towards reducing the frequency and severity of gout attacks[2].

S2 Reg. No. C665 (Act 101/1965) Colchicine Houdé (Tablets). Each tablet contains crystallised Colchicine 1 mg. For full prescribing information, refer to the Professional Information approved by the medicines regulatory authority. References: 1. Professional Information approved by SAHPRA: Colchicine Houdé (Tablets). 2. Tikly, M. & Makan, K. Gouty arthritis: An approach for general practice. *S Afr Fam Pract*. 55(4): 307-312. (2013). CIPLA MEDPRO (PTY) LTD. Co. Reg. No. 1995/004182/07. CIPLA Building 2, Junxion Park, 10 Elephant Lane, Century City, 7441, RSA. Website: www.cipla.co.za Customer Care: 080 222 6662. [1754874301b]

the time of the attack, it should not be discontinued.[19] The most commonly used agents for lowering serum uric acid levels are allopurinol (xanthine oxidase inhibitor) and probenecid.

Allopurinol and probenecid

Allopurinol acts by inhibiting the production of uric acid and thereby reducing the deposition of uric acid in joint tissue.[31] This agent is prescribed orally at 100 mg daily, with monthly increments of 100 mg based on the serum levels of uric acid.[28] Probenecid lowers serum uric acid levels by inhibiting the renal tubular transporter in order to increase the excretion of uric acid.[32] It is first prescribed as an oral dose at 250 mg twice daily for one week, and at a maintenance dose of 500 mg twice daily.

Challenges in current treatment of chronic gout

Despite its historical recognition, gout management continues to face numerous challenges. It is essential to consider gout as a chronic condition rather than solely addressing the acute episodes. The perception of gout is that it is an acute disease necessitating treatment solely during acute flares. To address the disease, chronic uric acid-lowering therapy is required to reduce serum uric acid levels below the saturation threshold of 6 mg/dL, alongside chronic anti-inflammatory prophylaxis, particularly during the initiation of uric acid-lowering therapy.[34] Uric acid-lowering therapy effectively manages gout; however, it poses challenges such as the necessity for lifelong adherence, the risk of initial gout flares upon treatment initiation, the requirement for regular uric acid level monitoring, potential drug-drug interactions, and adverse effects.[35] Significant treatment challenges in chronic gout encompass:

Poor medication adherence and health empowerment

Wang et al. reported that the medication adherence rate among gout patients was 59.89%, while the health empowerment score was 24.06%. This study's findings indicate that medication adherence among gout patients is inadequate, underscoring the necessity for clinical intervention. Approximately 60% of patients tend to reduce or discontinue their medication autonomously after experiencing symptom relief. This phenomenon can be attributed to several interrelated factors. Patients' insufficient comprehension of the disease hinders their recognition of the chronic characteristics of gout and its possible complications. Additionally, certain patients, unaware of the need for ongoing medication, erroneously perceive symptom relief as a sign of disease resolution. Gender differences significantly influence adherence, as male patients, who frequently participate in more social activities, are more prone to missing doses.[36] The incidence and prevalence of gout and hyperuricaemia among Black people have surpassed those in White adults, with a disproportionate impact on Black women.[37] This increasing difference can be wholly ascribed to social determinants of health, encompassing elevated obesity and poverty levels in Black women relative to White women, as well as worse renal function and inferior dietary quality among Black males compared to White males. Additionally, Black patients with gout have received inferior gout-related care and have reported elevated levels of healthcare utilisation, particularly among Black women. Black individuals with gout experience a disproportionate burden of the disease and elevated rates of non-adherence, indicating the necessity for culturally customised treatment strategies.[37]

Additional factors contributing to inadequate adherence included insufficient education and comprehension regarding medication administration and its role in disease management. Factors contributing to poor adherence encompassed insufficient financial resources, a deficiency in self-motivation for consistent medication intake, healthcare providers' noncompliance with treatment guidelines, and discrepancies between patients' and providers' views on gout management.[35] Poor adherence results

Table I: Treatment, efficacy, and safety profile overview[29,33]

Treatment	Efficacy measures	Safety profiles
Allopurinol	44.4–80% reach serum uric acid (SUA) < 6 mg/dL	Rash 1.5%; allopurinol hypersensitivity syndrome (AHS) rare; well-tolerated up to 800 mg; no new safety signals in 6-month studies
Febuxostat	48–65% reach SUA < 6 mg/dL (80–120 mg); more effective than allopurinol 300 mg	Similar adverse events to allopurinol; possible increased cardiovascular mortality (as reported in the CARES trial); no dose adjustment for mild-moderate chronic kidney disease (CKD)
Colchicine	38–41% achieve 50% pain reduction at 24 hours; low-dose as effective as high-dose with fewer gastrointestinal adverse events	Gastrointestinal adverse events (diarrhoea 23% low-dose vs. 77% high-dose); severe adverse events rare at low dose
NSAIDs	Effective for acute flares; no significant difference between agents	Gastrointestinal, renal, cardiovascular adverse events; avoid in chronic kidney disease or cardiovascular disease
Corticosteroids	As effective as NSAIDs for acute flares; fewer adverse events	Fewer gastrointestinal adverse events than NSAIDs; short-term use generally safe
Probenecid	Effective for SUA lowering; less effective than benzbromarone	Renal stones, gastrointestinal adverse events; avoid in chronic kidney disease
Benzbromarone	Achieves optimal SUA	Hepatotoxicity risk; not available in all regions
Pegloticase	42% maintain SUA < 6 mg/dL	Infusion reactions, immunogenicity, cardiovascular adverse events
Canakinumab	Superior to triamcinolone for pain/flare reduction; 62% lower flare risk	Infection risk, high cost
Lesinurad	54–76% reach SUA < 6 mg/dL (with xanthine oxidase inhibitor)	Nephrotoxicity risk, especially as monotherapy

S3

ALLOPURINOL 100 Cipla

Allopurinol 100 mg

S3

ALLOPURINOL 300 Cipla

Allopurinol 300 mg

Cipla

INDICATIONS[1]

ALLOPURINOL CIPLA is indicated for the treatment of gout and hyperuricaemia associated with other conditions.

It may be effective in patients with impaired renal function. ALLOPURINOL CIPLA is also used in the treatment of hyperuricaemia associated with leukaemia or resulting from radiotherapy or the use of antineoplastic agents such as mercaptopurine, or during treatment with diuretics of the thiazide or similar type.

S3 Reg. No. P/3.3/180, 181. Allopurinol 100 Cipla / Allopurinol 300 Cipla. Each tablet contains Allopurinol 100 mg / 300 mg. For full prescribing information, refer to the Professional Information approved by the medicines regulatory authority. References: 1. Professional Information approved by SAHPRA: Allopurinol 100 Cipla; Allopurinol 300 Cipla (Tablets). CIPLA MEDPRO (PTY) LTD. Co. Reg. No. 1995/004182/07. Building 9, Parc du Cap, Mispel Street, Bellville, 7530, RSA. Website: www.cipla.co.za. Customer Care: 080 222 6662 [1441517501a]

in suboptimal outcomes and ongoing disease progression. Non-adherence is associated with an increased frequency of flares and a reduced likelihood of achieving urate targets.[38]

Difficulty achieving target uric acid levels

Gout management encompasses two primary components: the treatment of gout flares for immediate symptomatic relief and long-term urate-lowering therapy (ULT) aimed at reducing serum uric acid levels to prevent future gout flares and the formation of tophi. However, achieving and maintaining target serum uric acid levels presents challenges, and the clinical benefits of ULT require time to manifest.[39] The objective is generally to keep serum uric acid levels under 6 mg/dL; however, numerous patients find it challenging to achieve and sustain these levels due to various factors, such as insufficient monitoring, treatment disruptions, and the presence of chronic kidney disease comorbidities.[40] The administration of ULT without reaching the uric acid target suggests that crystal deposits will persist, placing the patient at risk for adverse medication-related events.[41]

Paradoxical flare initiation

Flare represents the primary characteristic of gout, resulting from the inflammatory response to monosodium urate crystals. Thus, the prevention of gout flares should be the principal objective of gout management. Nonetheless, the paradoxical rise in flare risk after the commencement of ULT poses significant challenges for demonstrating the anticipated long-term advantages of flare prevention in clinical trials. The paradoxical deterioration observed at the initiation of treatment may dissuade patients and complicate management strategies.[42]

Treatment resistance and refractory cases

Certain patients experience chronic refractory gout that exhibits inadequate response or resistance to conventional treatments. Chronic refractory gout is characterised by persistent hyperuricaemia accompanied by recurrent flares, tophi, and/or chronic gouty arthritis. This condition occurs when conventional therapy fails to normalise serum uric acid levels, and when signs and symptoms remain inadequately managed despite the use of oral xanthine oxidase inhibitors at the maximum medically appropriate dosage, or when these medications are not tolerated or are contraindicated. Patients with chronic refractory gout present significant treatment challenges, and available therapeutic options are limited, underscoring the necessity for innovative strategies in complex cases.[43]

Advances in the treatment of chronic gout

The challenges in current treatment highlight the need for innovative therapies and personalised approaches. Recent advancements in the treatment of chronic gout indicate a notable evolution in therapeutic strategies, influenced by a deeper understanding of the disease and the creation of new targeted therapies.[44] The field is progressing due to the emergence and implementation of advanced biological therapies, an increasing focus on personalised medicine, and advancements in genetic research.[45]

Nanoparticles delivery systems approach

Advancements in nanotechnology present promising novel strategies for enhancing gout therapy. The advent of nanotechnology has generated new prospects for improving the pharmacological characteristics and clinical efficacy of medication formulations. Numerous nanostructured delivery systems, such as polymeric nanoparticles, liposomes, solid lipid nanoparticles (SLNPs), and nanoemulsions, have significantly advanced through the integration of traditional herbal remedies, providing superior attributes and accurate targeting abilities. Nanoparticles possess considerable potential to enhance drug delivery systems, mitigate inflammation, and alter the behaviour of urate crystals. They facilitate the precise administration of medications directly to the afflicted joint, enhancing therapy efficacy and reducing systemic adverse effects. Contemporary therapies, including anti-inflammatory and uric acid-lowering medications, sometimes encounter obstacles such as inadequate solubility, rapid elimination, and restricted absorption, which may diminish their therapeutic effectiveness. Nanoparticles present a viable option by augmenting drug bioavailability via enhanced solubility, safeguarding against premature degradation, and facilitating targeted distribution to inflamed joints. This can decrease necessary dosages, mitigate systemic adverse effects, and provide prolonged therapeutic results, hence reducing administration frequency and enhancing patient adherence.[44]

Emerging novel therapies

Pozdeutinurad (AR882) signifies a novel category of dual-pathway inhibitors that may provide benefits compared to current treatments.[46] In the trial including AR882, 42 patients with refractory gout with at least one subcutaneous tophus were randomised to receive either 75 mg AR882, 50 mg AR882 in conjunction with allopurinol, or allopurinol monotherapy. This study indicated that long-term administration of AR882, either alone or in conjunction with allopurinol, for the management of tophaceous gout patients was well tolerated, exhibited a comparable safety profile, and showed superior efficacy compared to allopurinol alone. The findings endorse AR882 as a secure therapeutic alternative for gout patients, encompassing those with both overt and subclinical crystal deposition.[46]

Other novel medicines, including IL-1 inhibitors (canakinumab, anakinra, rilonacept), present additional alternatives for the management of gout attacks, but some remain unapproved by the Food and Drug Administration (FDA).[44]

Breakthrough biological therapies

The most notable advancement has been the creation of biological treatments, specifically pegloticase. Biological pharmaceuticals like pegloticase are transforming the management of chronic and severe gout, especially for individuals unresponsive to

conventional therapies. This PEGylated uricase enzyme offers a potent alternative for refractory instances where standard therapies have been ineffective.[43] Recent studies have improved the efficacy of pegloticase via combinatorial strategies. Findings from this extensive observational registry indicate that concurrent immunomodulatory medication therapy enhances the persistence of pegloticase, resolving prior issues related to treatment durability.[47]

Personalised medicine approaches

Treatment is progressively being personalised, with genetic studies guiding therapeutic choices. Clinicians may now more accurately anticipate patient responses to certain medications and customise therapies accordingly, departing from the conventional trial-and-error methodology. Implementing pharmacogenomic (PGx) testing helps identify predisposed individuals to benefit from specific treatments, enhance medication adherence, and diminish pill load.[48] Individuals possessing the HLA-B*58:01 allele are at an elevated risk of severe and perhaps fatal dermatological responses when treated with allopurinol. Moreover, racial inequalities in the prevalence of HLA-B*58:01 necessitate genetic screening in high-risk populations, particularly some Asian subgroups and African Americans. Individuals with G6PD deficiency may get haemolytic anaemia and methemoglobinaemia after using pegloticase and probenecid. Individuals possessing the less active variant of the drug-metabolising enzyme CYP2C9 exhibit an elevated risk of NSAID-induced upper gastrointestinal haemorrhage.[45]

Future perspectives in gout treatment

The future of gout management is increasingly shaped by a multifaceted research landscape, with novel drug classes, immunomodulation, gene-based therapies, and personalised treatment paradigms that together promise more effective and patient-centred care. There are several ULTs under investigation. For example, lesinurad and verinurad are novel selective uric acid reabsorption inhibitors that act on the Urate Transporter 1 (URAT1) transporter in the kidney. They provide a targeted approach to enhance uric acid excretion.[49] Beyond uric acid lowering, emerging research into immunomodulatory therapies targeting specific inflammatory pathways involved in gout pathogenesis offer the potential for more precise and less toxic interventions compared to broad anti-inflammatory drugs.[2]

Additional innovative trends in gout management include the repurposing of sodium-glucose co-transporter 2 (SGLT2) inhibitors, which not only reduce gout flares but also lower mortality and address associated cardiometabolic comorbidities.[50] Cutting-edge gene therapies using mRNA and CRISPR-Cas9 hold promise for addressing the genetic predispositions underlying hyperuricaemia and chronic gout, contribution to the possibility of long-term disease control or even curative approaches by correcting specific mutations affecting uric acid metabolism.[6] These strategies promise more precise, effective and potentially curative approaches.

Conclusion

Gout remains amongst diseases with high prevalence owing to lifestyle patterns, metabolic syndrome, and certain medications. Moreover, the high prevalence of comorbidities such as hypertension, diabetes, chronic kidney disease and the frequent use of uric acid-raising medication like thiazide diuretics complicate the management of gout in local practice. The limited, inaccessible, and non-specific detection and monitoring strategies hinder gout management, as early detection could be central to gout prognosis. The increased understanding of uric acid metabolism offers unique pharmacological interventions that could accelerate the elimination and excretion of uric acid. Treat to target serum urate below 6 mg/dL remains the main strategy to prevent recurrent flares and joint damage. Allopurinol is the most commonly used ULT due to it being widely available and cost effective. In resource-limited settings, patient education and adherence support are important particularly where follow-up and lab monitoring is inconsistent. Through these strategies, gout management strategies could shift towards targeting the root cause, instead of only treating complications or alleviating symptoms. Harnessing advancements in drug formulation strategies and pharmacogenomics could be pivotal in reducing side-effect of anti-gout drugs, improving their efficacy profile (primary and secondary endpoints), and patient compliance. Whilst the above represent exciting innovative avenues, patient education and counselling should also be considered as an integral instrument in gout management practices.

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Is your patient's asthma well controlled? Bridging the gap between perceived and actual control in contemporary asthma management

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Abstract

Asthma is a chronic, heterogeneous inflammatory airway disease that remains sub-optimally controlled in a significant proportion of patients despite the availability of effective therapies and evidence-based clinical guidelines. This narrative review explores the contemporary concept of asthma control, shifting the focus from static disease severity to dynamic assessment of symptom burden and future risk. Key barriers to optimal asthma management are examined, including patient–clinician perception gaps, poor adherence to inhaled corticosteroid therapy, incorrect inhaler technique, persistent environmental triggers, and comorbid conditions. The role of validated assessment tools, such as symptom-based questionnaires, is highlighted as a means of reducing subjectivity and improving routine clinical evaluation. Emerging management strategies, including maintenance and reliever therapy, therapeutic patient education, digital health technologies, and biologic therapies for severe disease, are discussed. Emphasis is placed on patient empowerment and self-management, with the inclusion of a practical asthma control checklist to facilitate early recognition of poor control and timely intervention. Overall, this article underscores that well-managed asthma is achievable for most patients through regular assessment, shared decision-making, and integration of guideline-directed care into real-world practice, ultimately aiming to restore normal daily functioning and reduce preventable morbidity

Keywords: asthma control, asthma management, inhaler adherence, patient empowerment, asthma self-management, assessment tools, chronic airway disease

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Introduction

Asthma is a heterogeneous chronic inflammatory disease of the airways characterised by bronchial hyper-responsiveness with respiratory symptoms such as wheeze, shortness of breath, and cough.[1,2] Affecting approximately 260 million people worldwide, its prevalence continues to rise, particularly in low- and middle-income countries.[3,4] While modern pharmacotherapy makes asthma control achievable for the majority of patients, real-world data consistently show a significant gap between clinical goals and patient outcomes.[5,6]

While contemporary pharmacotherapy makes asthma control achievable for most patients, real-world data consistently demonstrate a substantial gap between guideline-defined treatment goals and patient outcomes.[5,6] This disconnect has prompted a fundamental shift in asthma management over the past two decades, moving away from a static severity-based classification toward a dynamic, control-based approach.[1,7] Rather than viewing asthma severity as a fixed characteristic, this paradigm recognises that disease activity fluctuates over time and that even patients with apparently mild asthma may experience severe or life-threatening exacerbations if control is inadequate.[1,2]

Asthma control is now defined by two complementary domains: current symptom control, encompassing daytime and night-time symptoms, reliever medication use, and activity limitation; and future risk, including exacerbations, lung function decline, and treatment-related adverse effects.[1,6] Despite the clarity of these definitions, poor asthma control remains common in routine clinical practice. A major contributor is the discrepancy between patient-perceived control and objective clinical status. In large multinational surveys, most patients report their asthma as well controlled, despite failing to meet objective criteria for control.[5] Many patients develop "low expectations", normalising persistent symptoms and recurrent urgent care visits as inevitable aspects of the disease.[5]

This misperception is not limited to patients. Evidence suggests that healthcare providers may also overestimate asthma control, particularly when structured assessment tools are not routinely used. As a result, the true impact of symptoms on daily functioning and quality of life may be underestimated, leading to missed opportunities for treatment optimisation. In parallel, well-recognised modifiable factors—including poor adherence to inhaled corticosteroid therapy, incorrect inhaler technique, ongoing exposure to environmental triggers, and the presence of comorbid conditions—continue to undermine asthma control across diverse populations.[4]

Against this backdrop, there is growing emphasis on routine, standardised assessment of asthma control using validated tools, coupled with patient-centred management strategies that prioritise education, shared decision-making, and self-

management.[2] This narrative review examines contemporary concepts of asthma control, explores key barriers to optimal management, and evaluates established and emerging strategies aimed at improving outcomes. Emphasis is placed on patient empowerment and structured assessment, including the use of validated questionnaires and a practical asthma control checklist to support early identification of poor control and timely intervention.

Pathological components of asthma can be described as cellular inflammation, including bronchitis, and the remodelling of the structural elements of the airway wall.[1,4] This includes inflammation of the airway, constriction of the airway via smooth muscle contraction, the hypersecretion of mucus, bronchial hyperresponsiveness, and additional narrowing of the airway due to mucosal oedema and sloughing of the epithelial cells.[2,3]

Precipitating factors

Asthma symptoms are characteristically variable, often triggered or worsened by specific precipitating factors.[2] Identifying and avoiding these triggers is a cornerstone of effective self-management.[1]

Environmental and irritant triggers

Exposure to environmental pollutants and irritants is a primary cause of loss of control.

- **Tobacco smoke:** Both active and passive smoking are major precipitating factors that not only increase symptoms but also attenuate the therapeutic response to inhaled corticosteroids.[6,7] Children of parents who smoke face a three-fold higher burden of disease and more frequent chest infections.
- **Air pollution and fumes:** Common irritants include outdoor air pollution, wood smoke from biomass fuels, and strong scents such as perfumes, detergents, and industrial chemicals.[5]
- **Weather changes:** Many patients experience worsening symptoms in response to cold air, humidity, or sudden changes in temperature.[5,]

Allergens

For the majority of patients, especially those with the allergic (extrinsic) phenotype, allergens are a dominant precipitating factor.[2]

- **Common aeroallergens:** Household dust mites, grass and tree pollens, animal dander (fur and feathers), and moulds are frequent triggers for acute symptoms.[5]
- **Occupational sensitisers:** In some adults, asthma is precipitated by specific agents in the workplace, a condition known as occupational asthma.[6]

Clinical and biological factors

Internal biological changes and co-existing medical conditions can also precipitate asthma flares:

- **Viral Infections:** Respiratory viruses, particularly the common cold (Rhinovirus), are the most frequent triggers for severe asthma exacerbations in both children and adults.[7]
- **Comorbidities:** Conditions such as allergic rhinitis, obesity, and gastro-oesophageal reflux disease (GORD) can aggravate airway inflammation and make asthma more difficult to manage.[2]
- **Hormonal changes:** Worsening symptoms can be precipitated by hormonal fluctuations, such as those occurring during the premenstrual period (catamenial asthma) or pregnancy.[2]
- **Medications:** Certain drugs, including beta-blockers (even in eye drops) and aspirin, can precipitate severe bronchospasm in sensitive individuals.[2]

Lifestyle and psychological factors

- **Exercise:** Physical exertion is a well-known trigger, particularly when performing activities in cold, dry air without a proper warm-up.[5]
- **Emotions:** Strong emotional distress, anxiety, and depression can influence symptom perception and act as psychological triggers for asthma attacks.[1]

Signs and symptoms: from acute episodes to chronic impairment

The presentation of asthma is characterised by symptoms that vary over time and in intensity, often associated with variable expiratory airflow limitation.[1,2]

Acute symptoms (exacerbations)

Acute asthma exacerbations represent a change from the patient's usual status and can range from moderate to life-threatening.

- **Moderate exacerbations:** These are events outside the patient's usual day-to-day variation, often lasting two days or more, characterised by a deterioration in symptoms and an increased need for a rescue bronchodilator.[1]
- **Severe signs:** In severe episodes, patients may experience shortness of breath while sitting still and may be unable to speak in full sentences, limited to only a few words at a time.[5]
- **Emergency warning signs:** Severe exacerbations often require urgent medical intervention to prevent respiratory failure or death.[1]

Chronic symptoms

Chronic asthma is defined by persistent respiratory symptoms that interfere with daily life.[2]

- **Cardinal signs:** The classic symptoms include wheezing, shortness of breath, chest tightness, and coughing.[1]
- **Night-time impact:** A common sign of poor chronic management is nocturnal waking due to cough or breathlessness.[5]
- **Activity limitation:** Chronic poorly managed asthma frequently prevents patients from participating in exercise or routine physical activities.[5]

Table I: Asthma severity subcategories[1,7]

Severity Classification	Symptom Frequency	Nighttime Awakenings	Reliever Use	Interference with Activity
Intermittent	≤ 2 days/week	≤ 2 times/month	≤ 2 days/week	None
Mild Persistent	> 2 days/week	3–4 times/month	> 2 days/week	Minor limitation
Moderate Persistent	Daily	> 1 time/week	Daily	Some limitation
Severe Persistent	Throughout the day	Often 7 times/week	Several times/day	Extreme limitation

- **Systemic indicators:** Frequent reliance on a reliever (blue) inhaler (more than twice a week) and recurrent chest infections are clear indicators that the underlying inflammation is not being addressed.

Classification of asthma severity

Historically, asthma was classified by its underlying severity based on the level of symptoms and airflow limitation before the start of treatment. While clinical practice has shifted toward a control-based management strategy, the initial classification of severity remains a useful tool for establishing starting therapy. Table I indicates the classification of severity.

From severity to clinical control

Historically, asthma management was based on a static classification of severity (intermittent, mild, moderate, or severe persistent). However, clinical guidelines have shifted toward a control-based management strategy.[1,7] This transition recognises that severity is not a fixed feature; a patient with "mild" underlying disease can still experience life-threatening exacerbations if poorly controlled.[1,2]

In response to these limitations, contemporary clinical guidelines have shifted toward a control-based management strategy that prioritises ongoing assessment of disease status rather than retrospective categorisation.[1,7] This paradigm recognises that asthma severity is not an inherent or immutable characteristic but rather a reflection of the intensity of treatment required to achieve and maintain control. Consequently, a patient with apparently "mild" asthma may still be at substantial risk of severe or life-threatening exacerbations if control is poor, while a patient with historically severe disease may achieve excellent outcomes when optimally managed.[1,2] This shift has profound implications for clinical practice, emphasising the need for regular review and treatment adjustment rather than reliance on baseline severity alone.

Asthma control is defined by two domains: symptom control (daytime and night-time symptoms, reliever use, and activity limitation) and future risk (exacerbations, lung function decline, and medication side-effects).[1,6] According to the Global Initiative for Asthma (GINA), asthma is considered well-controlled if a patient has daytime symptoms ≤ 2 times a week, no night waking, and no activity limitations.[1,5]

The transition from severity-based to control-based management has therefore reframed asthma care from episodic symptom treatment to proactive, longitudinal disease management. By focusing on real-time assessment of control and risk, clinicians are better equipped to identify suboptimal management early, personalise therapy, and prevent avoidable morbidity. This evolution underpins modern asthma guidelines and forms the conceptual foundation for subsequent advances in assessment tools, self-management strategies, and multidisciplinary care models.

Diagnosis

A firm diagnosis of asthma is established by identifying characteristic symptom patterns and providing objective evidence of variable expiratory airflow limitation:[1,2]

1. **Clinical history:** Diagnosis is suggested if symptoms are variable, worse at night or early morning, and triggered by factors like exercise or allergens. A personal or family history of atopic disorders (eczema, allergic rhinitis) is supportive.
2. **Physical examination:** The most common sign is an expiratory wheeze on auscultation, though a normal exam does not exclude asthma due to its variable nature.
3. **Lung function testing:**
   - **Spirometry and reversibility:** This is the standard test. A significant response is defined as an increase in Forced Expiratory Volume in 1 second (FEV1) of > 12% and 200 mL after inhaling a bronchodilator.
   - **Peak expiratory flow (PEF):** A 20% improvement in PEF post-bronchodilator or a diurnal variation (morning vs. evening) of more than 10% over two weeks is diagnostic.
   - **Challenge tests:** For those with normal initial tests, a methacholine or exercise challenge test can identify airway hyperresponsiveness.

The perception and specialist gap

A primary barrier to achieving control is the discrepancy between patient perception and objective clinical status. In the multinational Asthma Insight and Management (AIM) survey, 81% of patients perceived their asthma as well-controlled, yet only 18% met objective criteria for control.[5] Many patients have "low expectations", accepting frequent symptoms and urgent care visits as an inevitable burden of the disease.[5,8]

This discordance extends to healthcare providers. Studies indicate that clinicians frequently overestimate asthma control and underestimate the impact of symptoms on a patient's quality of life.[9,10] In one study, specialists rated 54% of patients as "controlled" who were classified as "uncontrolled" by validated tools.[9]

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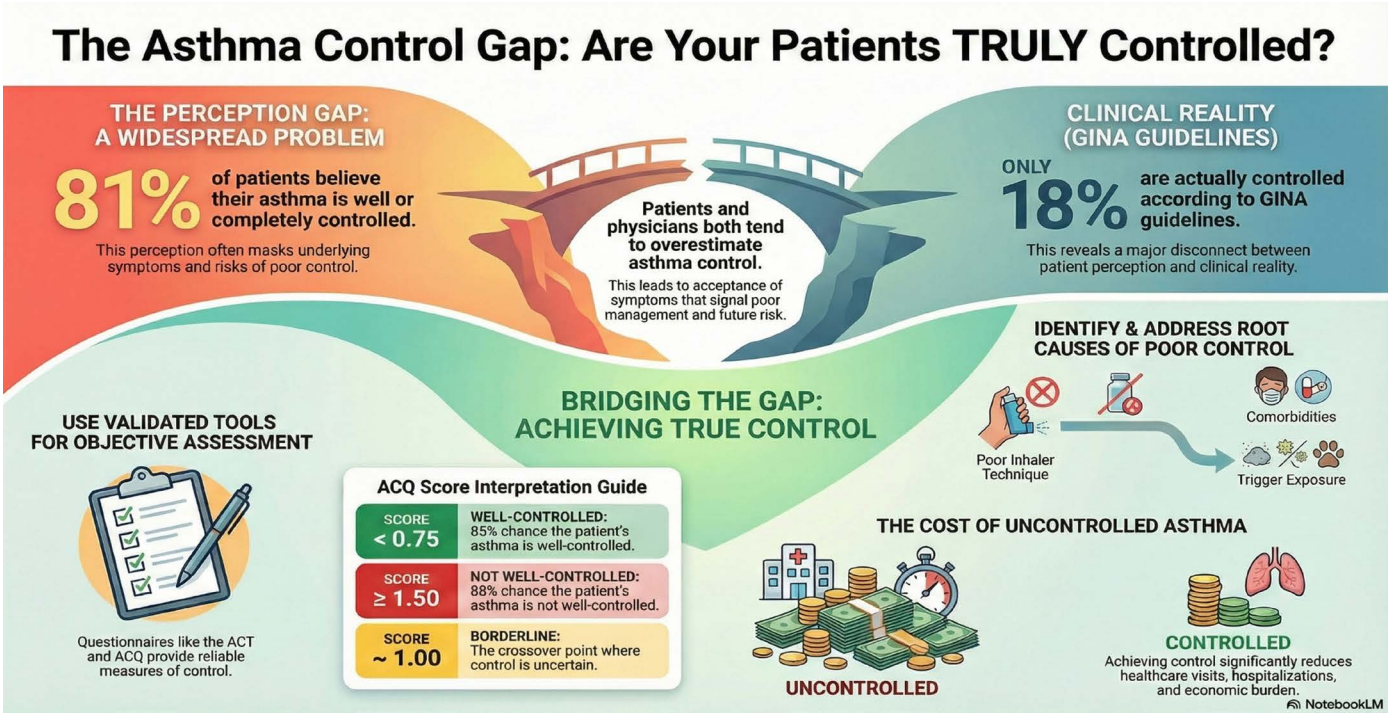

Figure 1: Infographic depicting the asthma control gap

Contributing factors to clinician overestimation include time constraints in clinical consultations, reliance on acute exacerbation history alone, and inadequate incorporation of patient-reported outcome measures into routine practice. Without systematic assessment, subtle but clinically meaningful indicators of poor control—such as nocturnal awakenings, increased reliever use, or activity avoidance—may go undetected.[9,10] This reinforces the need for structured, standardised approaches to asthma review that reduce subjective bias and align clinician and patient understanding of disease status.

The combined effect of patient underestimation and clinician overestimation of asthma control creates a substantial "control gap", in which persistent symptoms and future risk remain unaddressed despite regular healthcare contact. This gap underscores the critical importance of validated assessment tools, patient education, and shared decision-making to harmonise perceptions of control and guide appropriate treatment optimisation. Figure 1 illustrates this discrepancy between perceived and actual asthma control, emphasising the need for objective, routine evaluation in both specialist and primary care settings.[5,9] Figure 1 depicts an infographic on the asthma control gap.

Validated assessment tools

To minimise subjective bias and improve the accuracy of asthma evaluation, the routine use of validated, standardised assessment tools is strongly recommended in every clinical review.[2,9] Reliance on unstructured symptom enquiry alone has been shown to result in substantial misclassification of asthma control, contributing to both patient and clinician overestimation of disease stability. Incorporating validated questionnaires into routine practice provides an objective, reproducible framework for assessing symptom burden, functional impairment, and response to therapy over time.

The Asthma Control Test (ACT) is one of the most widely used patient-reported outcome measures in clinical and community settings. It consists of five simple questions assessing symptoms, reliever medication use, activity limitation, and overall perception of control over the preceding four weeks. Scores range from 5 to 25, with a score of 20 or higher indicating well-controlled asthma, scores between 16 and 19 reflecting partially controlled disease, and scores of 15 or lower indicating very poorly controlled asthma.[11,12] The ACT has been extensively validated across diverse populations and care settings, demonstrating strong correlation with lung function, exacerbation risk, and healthcare utilisation. Its simplicity and ease of administration make it particularly well suited for routine use in primary care and pharmacy-based asthma reviews.

The Asthma Control Questionnaire (ACQ) provides a complementary and more granular assessment of asthma control, incorporating symptom frequency, reliever use, and, in some versions, objective lung function measurements. A score of 0.75 or lower reliably indicates well-controlled asthma, while a score of 1.50 or higher signifies inadequately controlled disease requiring treatment adjustment.[10] The ACQ is especially valuable in specialist and research settings due to its sensitivity to change and ability to detect clinically meaningful differences in control over time.

Importantly, these tools not only facilitate accurate classification of asthma control but also enhance communication between patients and healthcare providers. By translating subjective experiences

Table II: Comparison of validated asthma control assessment tools[13]

Feature	Asthma Control Test (ACT)	Asthma Control Questionnaire (ACQ)
Primary purpose	Rapid assessment of asthma control in routine clinical practice	Detailed assessment of asthma control and treatment response
Number of items	5 questions	6–7 items (depending on version)
Assessment period	Previous 4 weeks	Previous 1 week
Domains assessed	Symptoms, reliever use, activity limitation, patient perception of control	Symptoms, reliever use, activity limitation, ± lung function
Scoring range	5–25	0–6
Interpretation of well-controlled asthma	≥ 20	≤ 0.75
Interpretation of poorly controlled asthma	≤ 15	≥ 1.50
Sensitivity to change	Moderate	High
Need for spirometry	No	Optional (in some versions)
Ease of use	Very simple; self-administered	More detailed; clinician-guided
Typical settings	Community pharmacy, primary care, routine reviews	Specialist clinics, research settings
Strengths	Quick, patient-friendly, suitable for frequent monitoring	Sensitive to small changes, strong validity for longitudinal follow-up
Limitations	Less granular; may miss subtle changes	Slightly longer; less practical in time-limited settings

into quantifiable scores, validated questionnaires support shared decision-making and enable timely treatment escalation or de-escalation in line with guideline recommendations. Regular use of ACT or ACQ has been shown to reduce the perception gap between patients and clinicians and to improve adherence to controller therapy through clearer demonstration of treatment benefit.[2,9]

Despite strong evidence supporting their use, validated assessment tools remain underutilised in routine practice. Integrating brief control questionnaires into standard clinical workflows, including pharmacy-led reviews and primary care consultations, represents a practical and cost-effective strategy to improve asthma outcomes. When used consistently alongside clinical judgement and objective measures, validated tools form a critical foundation for control-based asthma management and long-term risk reduction.[2,9] Table II indicates the comparison of validated asthma control assessment tools.

Barriers to optimal management

When asthma remains uncontrolled despite the availability of effective therapies, the underlying causes are almost always multifactorial and extend beyond pharmacological considerations alone. These barriers operate at patient, treatment, and environmental levels and often coexist, compounding their impact on disease control.

Treatment non-adherence

Suboptimal adherence to inhaled corticosteroid (ICS) therapy remains one of the most significant and persistent barriers to effective asthma management. Reported adherence rates commonly range from 22% to 63%, underscoring the scale of this challenge in routine practice.[4] Many patients adopt an "episodic" model of medication use, reserving preventer therapy for periods of symptomatic deterioration and discontinuing treatment once symptoms improve.[4,8] This behaviour, often referred to as "intelligent non-adherence", reflects deliberate decision-making rather than simple forgetfulness, driven by misconceptions about asthma chronicity, concerns about corticosteroid safety, and a preference for immediate symptom relief over long-term prevention.

The consequences of poor adherence are substantial, including increased symptom burden, higher exacerbation rates, and greater reliance on reliever medication. Importantly, non-adherence may go unrecognised by clinicians, leading to inappropriate escalation of therapy rather than targeted adherence support. Addressing adherence therefore requires not only education but also open, non-judgemental communication that acknowledges patient beliefs and treatment priorities.[4,8]

Incorrect inhaler technique

Even when prescribed appropriately and taken regularly, asthma medication may fail to achieve its intended effect if inhaler technique is incorrect. Studies indicate that up to 70–80% of patients use their inhaler devices incorrectly, significantly reducing pulmonary drug deposition.[4] Common errors include failure to exhale fully before inhalation, poor coordination between actuation and inhalation, insufficient inspiratory flow, and failure to hold breath after inhalation.[4,14] These errors are particularly prevalent among patients using multiple device types or those who have not received repeated technique reinforcement.

Incorrect inhaler technique is a modifiable barrier that responds well to targeted education and hands-on demonstration. However, technique frequently deteriorates over time, highlighting the need for regular reassessment rather than one-off instruction.

Failure to address inhaler technique may result in persistent symptoms despite apparent adherence, contributing to both patient frustration and clinician misinterpretation of treatment failure.[4,14]

The "Reverse Phenomenon"

Emerging evidence from South African populations has identified a paradoxical pattern of medication use termed the "reverse phenomenon", in which patients demonstrate improved adherence during periods of poor control or acute exacerbation but reduce or discontinue controller therapy once symptoms improve.[15] This behaviour reflects a reactive approach to asthma management, in which medication is viewed as a short-term remedy rather than a preventive strategy.

The reverse phenomenon underscores the limitations of symptom-driven care and reinforces the importance of patient education focused on the preventive role of controller therapy. Without sustained adherence during asymptomatic periods, patients remain vulnerable to future exacerbations and progressive loss of control. Recognition of this pattern is particularly important in settings with high disease burden and limited access to specialist follow-up.[15]

Comorbidities and environmental triggers

Asthma control is further complicated by the presence of comorbid conditions and ongoing exposure to environmental triggers. Allergic rhinitis, obesity, gastro-oesophageal reflux disease, and depression have all been shown to adversely affect asthma outcomes, increasing symptom burden and exacerbation risk.[1,16] Failure to identify and manage these comorbidities can result in persistent symptoms despite optimised asthma pharmacotherapy.

Environmental exposures remain a constant challenge, particularly in urban and low-resource settings. Tobacco smoke, indoor and outdoor air pollution, occupational irritants, and aeroallergens such as dust mites and pollen contribute to airway inflammation and symptom instability.[16,17] Effective asthma management therefore requires a holistic approach that extends beyond medication adjustment to include trigger identification, lifestyle modification, and environmental control strategies.

Management approach

Modern asthma management follows a **stepwise approach**, where treatment is progressively increased (stepped up) to achieve control and reduced (stepped down) once control is maintained for a prolonged period.[2,6] Table III indicates the stepwise approach to asthma therapy.

Important clinical considerations[17]

- **Assessment before escalation:** Before stepping up therapy, clinicians must address inhaler technique and patient adherence, as poor technique is a primary cause of lost control.
- **Phenotypic assessment:** Patients who remain uncontrolled at Step 4 should be reviewed by a specialist for phenotypic assessment (e.g. evaluating eosinophils and IgE levels) to determine eligibility for biologic therapies.
- **Biologic therapies:** Targeted treatments such as Anti-IgE, Anti-IL-5/5r, or Anti-IL-4r may be considered in Step 5 for patients uncontrolled on standard inhaled therapies.
- **Bronchial thermoplasty:** This procedure may be considered in Step 5 at specialist referral centres for severe cases unresponsive to medical treatment.
- **Reliever choice:** The use of an ICS-formoterol combination for acute symptom relief is preferred over SABA alone, especially in patients who are not on long-term maintenance therapy.

Achieving control requires more than medication; it necessitates Therapeutic Patient Education (TPE), correct inhaler technique (using a spacer), and a written asthma action plan.

Asthma medications are broadly categorised based on their clinical role—controllers for long-term maintenance and relievers for acute symptom management—targeting the three primary airway changes: inflammation/swelling, excess mucus production, and muscle constriction.[17]

Inhaled Corticosteroids (ICS)

Considered the cornerstone and foundation of asthma treatment, ICS are the most effective long-term controllers.[2]

- **Mechanism of action:** They work by reducing airway inflammation and swelling, which in turn decreases the risk of

Table III: Stepwise approach to asthma therapy[1,2,4]

Step	Preferred Controller and Reliever Treatment	Alternative Treatment Options
Steps 1 and 2	**As-needed low-dose ICS-formoterol**.	**Option A:** As-needed SABA plus a separate low-dose ICS taken on each occasion the SABA is used. **Option B:** Regular daily low-dose ICS with as-needed SABA as a reliever.
Step 3	**Low-dose ICS-formoterol** used as both regular maintenance and for acute relief (MART).	**Option A:** Regular low-dose ICS-LABA maintenance with as-needed SABA reliever. **Option B:** Regular medium-dose ICS maintenance with as-needed SABA reliever.
Step 4	**Medium-dose ICS-formoterol** used as regular maintenance and low-dose ICS-formoterol as a reliever (MART).	**Option A:** Regular medium-dose ICS-LABA maintenance with as-needed SABA reliever. **Option B:** Consider adding a LAMA, LTRA, or sustained-release theophylline to the existing regimen.
Step 5	**High-dose ICS-formoterol** maintenance with low-dose ICS-formoterol reliever, with or without a separate LAMA.	**Option A:** High-dose ICS-LABA with as-needed SABA. **Option B:** Medium- or high-dose triple therapy (ICS-LABA-LAMA) with as-needed SABA. **Additional:** Consider adding azithromycin, LTRA, theophylline, or low-dose oral corticosteroids.

severe attacks.[17] On a molecular level, they inhibit inflammatory cytokines; however, their efficacy can be reduced in active smokers due to decreased histone deacetylase 2 activity, which is necessary for the anti-inflammatory response of steroids.[7,19]

- **Examples:** Budesonide, Fluticasone, and Beclomethasone.

Beta-2 Agonists (SABA and LABA)

These drugs act as bronchodilators to address bronchoconstriction (muscle tightening).[17]

- **Short-Acting Beta-2 Agonists (SABA):** These are reliever medications used for rapid relief of sudden symptoms. They provide quick relaxation of the smooth muscles around the airways to improve airflow.[19]
  - *Example:* Salbutamol.
- **Long-Acting Beta-2 Agonists (LABA):** These have a 12-to-24-hour duration and are used for maintenance.[2] They should never be used as monotherapy; they must be paired with an ICS to address the underlying inflammation.[1]
  - *Example:* Salmeterol and Formoterol. Notably, Formoterol has a fast onset of action, allowing it to be used in some regimens as both a controller and a reliever (MART).

Long-Acting Muscarinic Antagonists (LAMA)

LAMAs are used as adjunctive controller therapies for patients whose symptoms remain uncontrolled on ICS-LABA combinations.

- **Mechanism of action:** They work by blocking muscarinic receptors, which inhibits vagally mediated bronchoconstriction, effectively keeping the airways open for extended periods.[2]
  - *Example:* Tiotropium.

Leukotriene Receptor Antagonists (LTRA)

LTRAs are oral medications used as third- or fourth-line controller agents.

- **Mechanism of action:** They inhibit the leukotriene pathway, a specific chemical signalling route that drives airway inflammation and mucus production.[2]
  - *Example:* Montelukast.

Biologic therapies

Biologics are reserved for severe, refractory asthma that does not respond to traditional high-dose inhalers.[19]

- **Mechanism of action:** These monoclonal antibodies target specific inflammatory pathways by blocking cells or proteins (cytokines) like IgE, IL-4, IL-5, or IL-13 that trigger the immune system's overreaction in the lungs.[19]
  - *Examples:* Omalizumab (anti-IgE), Mepolizumab (anti-IL-5), and Dupilumab (anti-IL-4r).

Advancing management strategies

The concept of achieving "total asthma control" was most clearly demonstrated in the landmark Gaining Optimal Asthma ControL (GOAL) study, which showed that a substantially higher proportion of patients could achieve guideline-defined control with combination therapy using inhaled corticosteroids (ICS) and long-acting β_2-agonists (LABAs) compared with ICS monotherapy.[18] This study provided pivotal evidence that persistent symptoms and exacerbation risk often reflect insufficient anti-inflammatory treatment rather than intrinsic disease refractoriness, reinforcing the need for proactive treatment optimisation in patients with ongoing impairment.

Building on these findings, modern asthma management strategies increasingly emphasise personalised, control-based approaches that integrate pharmacological innovation with education, monitoring, and multidisciplinary care.

Maintenance and Reliever Therapy (MART)

Maintenance and reliever therapy represents a significant evolution in asthma pharmacotherapy by simplifying treatment regimens and aligning symptom relief with anti-inflammatory protection. This strategy employs a single inhaler containing ICS and formoterol for both daily maintenance and as-needed symptom relief.[2,6] By delivering additional corticosteroid doses at times of symptom worsening, MART reduces reliance on short-acting β_2-agonists and addresses airway inflammation early in the course of deterioration.

Clinical evidence demonstrates that MART reduces severe exacerbations, emergency healthcare utilisation, and overall corticosteroid exposure compared with fixed-dose maintenance regimens with separate reliever inhalers.[2,6] Importantly, the simplicity of a single-inhaler approach improves adherence and reduces patient confusion, making MART particularly advantageous in real-world settings where treatment complexity often undermines control.

Therapeutic Patient Education (TPE)

Therapeutic patient education is a central pillar of contemporary asthma management and a key enabler of sustained disease control. Structured education programmes focus on improving patient understanding of asthma pathophysiology, the preventive role of controller therapy, correct inhaler technique, trigger identification, and early recognition of worsening symptoms.[1,12]

Multiple studies have shown that TPE significantly improves Asthma Control Test scores, medication adherence, inhaler technique, and health-related quality of life while reducing exacerbation frequency and unscheduled healthcare visits.[1,12] Importantly, education is most effective when delivered as an ongoing process rather than a one-time intervention, reinforcing skills and adapting information to changing disease patterns and patient needs.

Digital solutions and monitoring technologies

Digital health technologies are increasingly being integrated into asthma care to support adherence, monitoring, and personalised

feedback. Electronic monitoring devices (EMDs) and "smart inhalers" objectively record medication use, inhalation technique, and reliever frequency, providing valuable insights into real-world treatment patterns.[4]

These technologies help identify non-adherence, inhaler misuse, and excessive reliever reliance—issues that are frequently underestimated during routine clinical encounters. When combined with clinician review and patient education, digital monitoring has been shown to improve adherence, reduce exacerbations, and facilitate earlier intervention before loss of control becomes clinically significant.[4] Digital solutions therefore represent a promising adjunct to traditional asthma management, particularly in patients with recurrent exacerbations or inconsistent treatment use.

Biologic therapies for severe asthma

For a minority of patients—estimated at 5–10%—asthma remains poorly controlled despite optimised inhaled therapy, adherence support, and trigger management. In these cases, biologic therapies targeting specific inflammatory pathways offer an important therapeutic advance.[2,7] Monoclonal antibodies directed against immunoglobulin E (anti-IgE) or interleukin-5 and its receptor (anti-IL-5/IL-5R) have demonstrated significant reductions in exacerbation rates, oral corticosteroid use, and symptom burden in patients with severe, type 2 inflammatory asthma.

The introduction of biologics has shifted the management of severe asthma toward a precision medicine approach, in which treatment is guided by clinical phenotype and biomarker profiles. While cost and access remain limiting factors, particularly in low- and middle-income settings, biologic therapies represent a transformative option for selected patients when integrated into specialist-led care pathways.[2,7]

Role of patient empowerment and self-management

Patient empowerment is increasingly recognised as central to chronic disease management. Self-monitoring tools, such as symptom checklists and peak flow diaries, foster shared decision-making and enhance treatment adherence. Integrating self-assessment into routine care encourages proactive behaviour, reduces dependence on emergency services, and aligns with preventative healthcare strategies.

A key component of self-management is patient understanding of asthma as a chronic inflammatory condition rather than an intermittent, symptom-driven illness. Misconceptions about the role of controller therapy remain widespread, with many patients perceiving inhaled corticosteroids as optional or necessary only during symptomatic periods.[8] This misunderstanding contributes directly to poor adherence and preventable loss of control. Therapeutic patient education programmes have consistently demonstrated improvements in medication adherence, symptom recognition, inhaler technique, and health-related quality of life, reinforcing the central role of education in empowering patients to manage their disease effectively.[12]

Self-monitoring tools play a pivotal role in translating empowerment into practical action. Symptom diaries, peak expiratory flow monitoring, validated control questionnaires, and written asthma action plans provide patients with objective feedback on disease status and clear guidance on when and how to adjust treatment or seek medical review. These tools reduce reliance on subjective symptom perception alone and promote shared decision-making between patients and healthcare providers. Importantly, regular self-assessment has been shown to reduce emergency healthcare utilisation and improve long-term outcomes when integrated into routine care.[6]

Digital health innovations are increasingly enhancing self-management by providing real-time feedback and behavioural reinforcement. Electronic monitoring devices and smart inhalers can identify patterns of non-adherence, incorrect technique, and over-reliance on reliever medication, enabling earlier and more targeted interventions.[4] When combined with patient education, these technologies shift asthma care from a reactive model toward proactive, preventative management.

Empowerment also extends beyond medication use to encompass trigger avoidance, lifestyle modification, and management of comorbid conditions. Patients who understand the relationship between environmental exposures—such as tobacco smoke, air pollution, allergens, and occupational irritants—and asthma control are more likely to adopt protective behaviours.[1,7] Similarly, addressing comorbidities such as allergic rhinitis, obesity, and psychological distress as part of a holistic self-management strategy further enhances disease control and quality of life.[6]

Ultimately, patient empowerment transforms asthma management from clinician-directed prescribing to a collaborative partnership in which patients assume an active role in maintaining control. By fostering health literacy, self-efficacy, and routine self-assessment, empowerment-based approaches reduce preventable exacerbations, optimise treatment effectiveness, and align asthma care with its overarching goal: enabling individuals to live normal, unrestricted lives despite a chronic respiratory condition.[6,8]

Role of the pharmacist in optimising asthma control

Pharmacists are uniquely positioned to play a pivotal role in improving asthma control due to their accessibility, frequent patient contact, and expertise in medicines management. In many healthcare systems, particularly in primary care and community settings, pharmacists represent the most regularly consulted healthcare professionals for patients with asthma. This places them at the frontline of identifying poor control, reinforcing appropriate therapy, and preventing avoidable exacerbations.[6,8]

One of the most significant contributions of pharmacists lies in the assessment and optimisation of medication use. Poor

adherence to inhaled corticosteroid therapy remains a leading cause of uncontrolled asthma, often driven by misconceptions, fear of adverse effects, or misunderstanding of the preventive role of controller medication.[4,8] Pharmacists are well positioned to address these barriers through targeted counselling, clarification of treatment goals, and reinforcement of the distinction between reliever and preventer therapy. Evidence consistently demonstrates that pharmacist-led interventions improve adherence, symptom control, and quality of life in patients with asthma.[12]

Inhaler technique assessment and correction is another critical area where pharmacists have a measurable impact. Incorrect inhaler technique affects the majority of patients and significantly compromises drug delivery and clinical response.[4,14] Routine, hands-on inhaler technique review by pharmacists—supported by device demonstration and teach-back methods—has been shown to result in sustained improvements in technique and asthma outcomes. Given the growing diversity of inhaler devices, pharmacist expertise is essential to ensure correct device selection and patient-specific education.

Pharmacists also play an important role in structured asthma control assessment. The routine use of validated tools such as the Asthma Control Test during pharmacy encounters enables early identification of poorly controlled asthma and facilitates timely referral for medical review.[2,9] By embedding brief control assessments into routine dispensing workflows, pharmacists can help bridge the gap between guideline recommendations and real-world practice.

Beyond medication-focused interventions, pharmacists contribute to broader self-management support by reinforcing written asthma action plans, advising on trigger avoidance, and promoting smoking cessation and vaccination where appropriate. Education delivered by pharmacists has been shown to enhance patient confidence, self-efficacy, and engagement in long-term asthma management.[6,8] This holistic approach aligns with contemporary models of chronic disease care that emphasise prevention, patient empowerment, and interdisciplinary collaboration.

In the context of emerging management strategies, pharmacists are increasingly involved in supporting maintenance and reliever therapy regimens, digital adherence technologies, and biologic therapies for severe asthma.[2,4] Their role in monitoring treatment response, identifying adverse effects, and supporting persistence with complex therapies further underscores their value within the multidisciplinary asthma care team.

Overall, pharmacists are integral to achieving and sustaining asthma control. Through medication optimisation, inhaler technique training, structured assessment, and patient education, pharmacists help translate guideline-directed care into everyday practice. Strengthening pharmacist involvement in asthma management represents a practical and cost-effective strategy to reduce preventable morbidity, improve quality of life, and move closer to the goal of well-managed asthma for all patients.[6,8]

Conclusion

Asthma control is not merely the absence of severe attacks but the restoration of a normal, active life. Success requires a collaborative partnership where clinicians use validated tools to identify "treatable traits" and patients are empowered through education to manage their chronic condition rather than reacting only to acute symptoms.[6,8]

This article highlights that persistent symptoms commonly arise from poor adherence to controller therapy, incorrect inhaler technique, unrecognised environmental triggers, unmanaged comorbidities, and discordance between patient and clinician perceptions of disease control. The transition to a control-based management paradigm has reinforced the importance of regular, objective assessment using validated tools to identify loss of control early and guide timely treatment adjustments.[1,6]

Advances in asthma management—including maintenance and reliever therapy, structured therapeutic patient education, digital adherence technologies, and biologic therapies for selected patients with severe disease—offer significant opportunities

Figure 2: Managing asthma analogy

to close the gap between guideline recommendations and real-world outcomes.[2,6,12,18] However, the effectiveness of these interventions depends on their integration into a patient-centred care model that emphasises continuous monitoring and shared decision-making.

Ultimately, achieving well-managed asthma requires a sustained partnership between healthcare providers and patients, in which individuals are empowered to understand their condition, recognise early signs of deterioration, and engage proactively in long-term management rather than reacting only to acute symptoms.[6,8] Embedding structured assessment tools and self-management strategies into routine care is essential to reducing preventable morbidity and healthcare utilisation and to achieving the fundamental goal of asthma management: enabling patients to live full, active lives across the entire disease spectrum.

Analogy: Managing asthma is like sailing a boat. If you only grab the rudder when a storm hits (an exacerbation), you are at constant risk of capsizing. True management means constantly adjusting the sails (preventer medication) to account for the shifting winds (triggers), ensuring a smooth journey even when the horizon looks clear. Figure 2 depicts this analogy.

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Probiotics: A brief overview and why delivery matters for clinical efficacy

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Abstract

The human gut microbiome is a diverse ecosystem of more than 40 trillion microorganisms that play an essential role in maintaining health. Disruptions in the gut microbiota, or dysbiosis, are linked to gastrointestinal disorders like inflammatory bowel disease and irritable bowel syndrome, as well as metabolic and immune-mediated conditions including obesity and diabetes.

Probiotics, defined as live microorganisms that confer health benefits when administered in adequate amounts, can help restore microbial balance. They act through mechanisms that include modulation of immune responses, inhibition of pathogens, and production of beneficial metabolites such as short-chain fatty acids. Prebiotics, in turn, are nondigestible food ingredients that selectively stimulate the growth or activity of beneficial bacteria, while synbiotics combine both components for synergistic effects.

Probiotic efficacy depends on strain specificity, viability, and delivery. Because probiotics are sensitive to heat, oxygen, and gastric acidity, encapsulation technologies have been developed to enhance survival. Probitec, a health supplement containing 15 billion CFUs of *Lactobacillus acidophilus* La-14, employs DUOCAP™ dual-capsule technology to protect the probiotic from gastric acid and ensure targeted intestinal release for optimal gut health benefits.

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Introduction

The human intestinal tract harbours a diverse and complex microbial community, the gut microbiome, which plays a central role in health and disease.[1,2] The gut microbiome co-evolves with the human host to form an intricate and mutually beneficial relationship.[1,3,4]

It has been estimated that the adult colon contains over 40 trillion bacterial cells from about 1 000 different bacterial species.[1,3] At the level of species and strains, the microbial diversity between individuals is remarkable and each individual harbours a distinctive microbial composition in the gut.[3] Twin studies have shown that, although there is a heritable component to gut microbiota, environmental factors related to diet, drugs, and anthropometric measures are larger determinants of the gut microbial composition.[5]

Gut microbes are key to many aspects of human health.[5] Disruption of the gut microbiota or *dysbiosis* can have major consequences for human health and has been associated with gastrointestinal conditions such as inflammatory bowel disease (IBD) and irritable bowel syndrome (IBS), as well as wider systemic manifestations of disease such as obesity, type 2 diabetes and atopy.[2]

The gut microbiome and its role in both health and disease has been the subject of extensive research in recent years.[2] Many studies have shown that populations of colonising microbes differ between healthy individuals when compared to those with disease.[3] It is an active area of research to determine whether supplementation with certain commensal bacteria or 'probiotics' will improve health or reverse disease.[3]

Probiotics and prebiotics – the concepts

The introduction of beneficial bacterial species into the gastrointestinal tract, by way of a probiotic and/or prebiotic, represents a strategy to revive the microbial equilibrium and prevent disease.[3]

Apart from modulating gut functionality, probiotics have been associated with various health benefits, such as boosting immunity and brain function, reducing cholesterol, suppressing endogenous and exogenous pathogens and promoting metabolic homeostasis through their biological mechanisms in the body.[5] Probiotics can produce short-chain fatty acids, vitamins, enzymes, organic acids, and antimicrobial peptides.[5]

Modification of the intestinal microbiota with probiotics, prebiotics, or synbiotics, therefore, may be able to achieve, restore or maintain a favourable balance in the gut microbiome.[6]

Adherence to the well-accepted definitions and concepts below will lead to consistency in how the terms are used both scientifically and on products:[3]

- **Probiotics – Live microorganisms that, when administered in adequate amounts, confer a health benefit on the host.** The term 'probiotic' should be reserved for live microbes that have been shown in clinical studies to impart a health benefit.

  Probiotics affect the intestinal ecosystem by impacting mucosal immune mechanisms, by interacting with commensal or potentially pathogenic microbes, by generating metabolic end products such as short-chain fatty acids, and by communicating with host cells through chemical signalling. These mechanisms

may antagonise the activity of potential pathogens, bolster the intestinal barrier, down-regulate inflammation, and up-regulate the immune response to antigenic challenges. These processes mediate most of the beneficial effects of probiotics, including reduction of the incidence and severity of diarrhoea, which is one of the most widely recognised uses of probiotics.

- **Prebiotics – Selectively fermented components that result in specific changes in the composition and/or activity of the gastrointestinal microbiota, thereby conferring benefits for the host's health.** The key aspects of a prebiotic are that it is nondigestible by the host and that it leads to health benefits through a positive influence on the resident beneficial microbes. Prebiotics affect intestinal bacteria by enhancing the numbers or activities of beneficial bacteria. Prebiotics may also impact immune function. Prebiotics typically consist of nonstarch polysaccharides and oligosaccharides. Most prebiotics are used as food ingredients and include oligofructose (fructoologosaccharide, FOS), inulin, galactooligosaccharides (GOSs) and lactulose.
- **Synbiotics – A mixture of live microorganisms (probiotics) and the selectively fermented components (prebiotics).** There are two types of synbiotics: complementary (mixtures of probiotics and prebiotics) and synergistic (mixtures of live microbes selected to use a coadministered substrate for a health effect).
- **Lactic acid bacteria (LAB)** – A functional classification of nonpathogenic, Gram-positive fermentative bacteria that are associated with the production of lactic acid from carbohydrates, making them useful for food fermentation. Species of *Lactobacillus, Lacticaseibacillus, Lactiplantibacillus, Limosilactobacillus, Levilactobacillus, Lactococcus,* and *Streptococcus thermophilus* are included in this group. Many probiotics are LAB, but some probiotics (such as strains of *E.coli* and yeasts) are not.
- **Fermentation** – A process by which a microorganism transforms food into other products, usually through the production of lactic acid, ethanol, and other metabolic end products. Fermentation is globally applied in the preservation of a range of raw agricultural products, such as cereals, fruit and vegetables, milk, meat, and fish.

Genera, species, and strains used as probiotics

A probiotic strain is identified by the genus, species, subspecies (if applicable) and an alphanumeric designation that identifies a specific strain.[3] In the scientific community, there is an agreed nomenclature for genus, species and subspecies names.[3] However, commercial strain names, product names and trade names are not controlled by the scientific community. Table I shows a few examples of commercial strains and the names associated with them.[3]

Strain designations are important because the most robust approach to probiotic evidence is to link benefits to specific strains or strain combinations of probiotics at the effective dose.[3] Some strains have novel properties that account for certain neurological, immunological, and antimicrobial activities while some mechanisms of probiotic activity are likely shared among different strains, species, or even genera.[3] For example, the ability to enhance short-chain fatty acid production or reduce luminal pH in the colon may be a core benefit expressed by many different probiotic strains.[3]

Probiotic products, dosages and quality

Probiotic-containing products have been successfully marketed all over the world.[3] The claims that can be made on these products differ, depending on regulatory oversight in the region. Most commonly, probiotics and prebiotics are sold as foods or dietary supplements.[3] Claims tend to be general, and products are targeted for the generally healthy population.[3]

Most guidance from medical organisations on probiotic use is based on strains rather than product names and it can be difficult to match probiotic strains to specific products, and not all products are suitably labelled.[3] From a scientific perspective, information on the probiotic product label should include:[3]

- Genus, species (and subspecies, if applicable), with nomenclature consistent with current scientifically recognised names
- Strain designation
- Viable count of each strain at the end of shelf life
- Recommended storage conditions
- Recommended dose*

*The dose needed for probiotics varies depending on the strain.[3] Many over-the-counter (OTC) products deliver in the range of 1 to 10 billion colony-forming units (CFUs) per dose.[3] It is not possible to state a general dose for probiotics and the recommended dosage should be based on human studies showing a health benefit.[3]

Table I: Nomenclature used for some probiotics

Genus	Species	Subspecies	Strain designation	International strain depository designation	Common name
Lacticaseibacillus Former name: *Lactobacillus casei*	*rhamnosus*	None	GG	ATCC 53103	LGG
Bifidobacterium	*animalis*	*lactis*	DN-173 010	CN-CM I-2494	*Bifidus regularis*
Bifidobacterium	*longum*	*longum*	35624	NCIMB 41003	*Bifantis*
Lactobacillus	*acidophilus*	None	La-14	ATTCSD5212	*Acidophilus*

PROBITEC™ DELIVERS BILLIONS MORE BACTERIA THAN OTHERS

93%
DOSE DELIVERED

0,0003%
DOSE DELIVERED

After direct exposure to a stomach acid simulation for 30minutes, Probitec™ retained 93% of it's dose whilst it's closest competitor retained 0,0003%

IN THE WORLD'S MOST ADVANCED PROBIOTIC CAPSULE

A POTENT DOSE OF
PREBIOTICS + PROBIOTICS

SIGNIFICANT RELIEF
FOR ALL
IBS SYMPTOMS

ENHANCING THE
COMPOSITION AND
INTEGRITY OF THE
WHOLE GUT SYSTEM

ERADICATE UTI'S AND
PREVENT RECURRANCE

AND IS THE ONLY

PHARMACEUTICAL GRADE PROBIOTIC

FULL BACTERIA PROTECTION: 2-YEARS SHELF STABILITY AND STOMACH ACID PROTECTION
CORRECT DOSE LEVELS WITH TARGETED DELIVERY TO THE INTESTINE
STRAIN SPECIFICITY, WITH CLINICAL TRIAL EVIDENCE

Since probiotics are live, they are susceptible to die-off during storage.[3] Some products have been shown, in some cases, to fail to meet label claims regarding the number and types of viable microbes present in the product.[3] Careful product selection is therefore essential.[3]

Product safety

Most probiotics in use today are derived either from fermented foods or from the microbes colonising the healthy human gut and are generally considered safe for oral consumption as part of foods and supplements and at levels traditionally used.[3] Most products are intended for the generally healthy population, so use in individuals with compromised immune function or serious underlying disease should be restricted to the strains and indications with proven safety and efficacy for these patient populations.[3]

Probiotic survival: Why delivery matters

While clinical evidence increasingly supports that probiotic supplementation has several beneficial effects on health, to successfully deliver probiotic benefits to the consumer, several criteria must be met:[7]

- **An intricate manufacturing process is required** that ensures both high yield and stability. The end-product must also meet requirements such as absence of contaminants and specific allergens.[7]
- **The probiotic must remain viable during transportation and storage**.[6] Probiotic organisms are sensitive to environmental stressors such as heat, oxygen, moisture and light.[7,8] Poor storage can lead to up to a 50% loss of viable organisms before purchase.[7,8] Liquids tend to be the least stable formulation, while glass packaging provides better protection against oxygen and light.[7,8] Manufacturers typically build in overages so that at the end of the product's shelf life, it does not fall below the potency stated on the label.[3]
- **The probiotic must be able to survive the harsh conditions during gastrointestinal transit** until it reaches the large intestine.[6,8,9] Once the probiotic reaches the large intestine it needs to adhere to and integrate into the existing microbiome.[11]

Encapsulating the probiotic cells with suitable wall material helps to sustain the survival of probiotics during industrial processing and in gastrointestinal transit.[9] In the encapsulation process, probiotic cells are completely enclosed in the wall material through different techniques, such as micro-encapsulation, nanocoatings, spray- and freeze-drying, liposome encapsulation, and pH-sensitive coatings.[9,10]

Duocap®, the patented, pH-sensitive, capsule-in-capsule technology, provides a convenient way to control the release of medicines to specific sites in the gastrointestinal tract.[12] The outer capsule dissolves in the acidic environment of the stomach, while the inner capsule bypasses the stomach and dissolves in the small intestine.[13]

Improving the viability of probiotic cells during industrial processing and extending cell viability during storage and digestion are main concerns for successful commercialisation.[9]

Probitec delivery system uses Duocap® technology

Probitec is a probiotic health supplement that contains 15 billion CFUs of *Lactobacillus acidophilus La 14* per capsule.[14] This probiotic strain may be used to normalise microbial balance in the gut, improve gut function, dysbiosis, and antibiotic-associated dysbiosis.[13]

Probitec uses the two-stage DUOCAP™ technology to provide protection from both external elements and from gastric acid.[13] DUOCAP™ technology allows the outer capsule to dissolve in the stomach releasing the prebiotic (fructooligosaccharides) while protecting the inner capsule until it reaches the small intestine (ph~6.5) where it releases the probiotic.[11,13]

Over two years, Probitec maintains 100% of its dose, providing an acceptable CFU count for clinical efficacy.[13]

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Ischaemic heart disease: pathophysiology, diagnosis, and therapeutic strategies

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Abstract

Ischaemic heart disease is the most prevalent cardiovascular disease, accounting for high global mortality. Ischaemic heart disease is a pathological condition characterised by a mismatch between myocardial oxygen supply and demand, caused by reduced cardiac blood flow due to atherosclerotic obstruction or microvascular dysfunction. Atherosclerotic plaques in the arterial lumen form blockages in the arteries. Risk factors include hypertension and hyperlipidaemia, exacerbated by modifiable risks such as smoking, diet and stress.

Ischaemic heart disease can be classified as stable ischaemic heart disease (chronic coronary syndrome) and acute coronary syndrome, which is further divided as unstable angina, ST- elevation myocardial infarction and non-ST elevation myocardial infarction.

Ischaemic heart disease is a preventable disease that can potentially be eradicated through effective management of risk factors. The dynamic process can be influenced by lifestyle modifications (smoking cessation, diet and stress management), pharmacological interventions (antiplatelet therapy and cholesterol-lowering agents) and revascularisation procedures (percutaneous coronary intervention and coronary artery bypass grafting).

Pharmacological interventions aim at preventing clot formation and prevention and stabilisation of plaques in the arterial lumen. Comorbidities such as hypertension must be optimally managed to reduce the workload and oxygen demand of the myocardium. Medicine such as statins, ACE-I and β-blockers are essential for the management of ischaemic heart disease.

The aim of this paper is to provide an update on the management of ischaemic heart disease, and to describe the role of the pharmacist in prevention of modifiable risk factors and management of established ischaemic heart disease.

Keywords: ischaemic heart disease, angina, STEMI, NSTEMI, risk factors, pharmacist

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The evolution of obesity pharmacotherapy from sympathomimetics to incretin-based therapies

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Abstract

Obesity is a chronic metabolic disorder that has reached epidemic proportions globally and in South Africa, contributing to the increasing burden of cardiometabolic diseases. Although lifestyle modifications remain a fundamental approach, long-term weight loss is often limited, necessitating the use of pharmacotherapy. Historically, centrally acting sympathomimetics, such as phentermine, have been predominant in South African treatments, albeit with restrictions concerning their safety and duration. This review examines the evolution of obesity pharmacotherapy from traditional agents, including phentermine and orlistat, to contemporary incretin-based therapies. Particular emphasis is placed on glucagon-like peptide-1 receptor agonists and dual incretin agonists, such as semaglutide and tirzepatide, which have demonstrated unprecedented efficacy in clinical trials involving patients with obesity. Emerging multi-hormonal and non-injectable agents are also discussed. This article underscores the transition from short-term appetite suppression to sustained pharmacological management of obesity and its comorbidities.

Keywords: incretin-based therapies, obesity, pharmacotherapy, weight management

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Use of probiotics in community pharmacy in South Africa: a survey of pharmacist attitudes, perceptions and knowledge

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Healthcare systems in South Africa: a review of integration of community pharmacists into multidisciplinary healthcare teams through musculoskeletal patient referrals

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Abstract

Background: Musculoskeletal conditions are a major health concern and are ranked among the highest leading causes of disability. Patients with musculoskeletal conditions tend to endure the symptoms or self-medicate with over-the-counter medication. A pharmacist's role extends beyond dispensing medication. Community pharmacists are well-positioned to identify patients at risk of chronic musculoskeletal symptoms, provide advice, and refer them for diagnosis and early medical intervention. Pharmacists need to be part of an integrated healthcare system to refer these patients in a timely and effective manner. Research indicates that there are challenges to integrating pharmacists into healthcare systems.

Aim: This review highlights the importance of integrating pharmacists into multidisciplinary healthcare teams within the South African healthcare system, by fostering a culture change and implementing a realistic workflow system through management and referral of patients with musculoskeletal conditions.

Methods: A scoping review was conducted using the Joanna Briggs Institute (JBI) method.

Findings and conclusion: There were 45 publications included in the review, where there are policies on the integration of pharmacists into multidisciplinary healthcare teams. Nevertheless, pharmacists are frequently excluded from these teams. It is also important for pharmacists to be equipped with the knowledge and training that will enable them to integrate into multidisciplinary healthcare teams.

Contribution: The review has highlighted the need for integrating community pharmacists into multidisciplinary healthcare teams for managing musculoskeletal conditions, emphasising their role in early intervention, patient referrals, and addressing barriers to effective integration within the South African healthcare system.

Keywords: interprofessional collaboration, joint diseases, community pharmacists, primary healthcare, therapeutic window, patient referral systems, musculoskeletal conditions

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An academic review of the developed diagnostic and educational tools for bone diseases or disorders

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Abstract

Educational tools are exemplary means of disseminating comprehensive information on bone diseases or disorders which negatively influence a patient's quality of life. These resources require constant revision to provide the latest facts and figures to the global population at all times. Existing tools, whilst effective, may require updating and the adoption of novel approaches to meet the needs of specific target populations. Coupling educational resources with diagnostic tools such as Dual-energy X-ray absorptiometry (DEXA/DXA) is one such innovative way of providing optimum patient care and quality treatment. Furthermore, should new educational tools be devised, developers will need to reflect on the specific incongruity between the standards achieved using the current tools and the desired standards envisaged from the new tool. Reflecting on the former and latter tools will aid in identifying and addressing areas that require improvement in the current tool to optimise patient outcomes.

Keywords: role, educational tools, bone diseases, patient care

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An overview of respiratory tract infections in South Africa

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Abstract

Respiratory tract infections represent a significant global health concern, including high rates of morbidity and mortality. Upper respiratory tract infections (common cold, rhinosinusitis, tonsillitis, laryngitis and otitis media) are usually mild and self-limiting, while lower respiratory tract infections lead to more severe illness (bronchitis, bronchiolitis and pneumonia), and are still one of the top ten leading causes of mortality. In Africa, and other lower-income countries, the burden especially among children under the age of five years is severe.

Respiratory tract infections can be differentiated between upper or lower respiratory tract infections. Upper respiratory tract infections have mainly viral origins and can be treated symptomatically. Lower respiratory tract infections involve bronchi, bronchiole and alveoli, with pneumonia the most common presentation.

Management of lower respiratory tract infection depends on the underlying cause, severity, and comorbidities. Viral lower respiratory tract infection requires supportive care such as rest, hydration and antipyretics. Antiviral therapy may be considered for confirmed influenza. Bacterial lower respiratory tract infections, particularly community-acquired pneumonia, require empiric antibiotic therapy guided by local antimicrobial guidelines.

As accessible frontline health professionals, pharmacists assess symptoms, identify critical warning signs, and facilitate appropriate referrals, thereby ensuring safe and timely patient care. This paper provides an overview of the relevant symptoms and management of upper and lower respiratory tract infections.

Keywords: respiratory tract infections, viral infections, bacterial infections; symptomatic management

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Reduced valproic acid concentrations in patients receiving carbapenems: meta-analysis

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Abstract

Introduction: The administration of valproic acid (VPA) with a carbapenem antibiotic results in reduced VPA concentrations. This article aims to examine the existing literature on the impact of the co-medication between VPA and carbapenem, and conduct VPA model-based dose optimisation using simulated participants.

Methods: A literature review was conducted utilising Medline™ (via PubMed®), ResearchGate®, and Google Scholar™ (using the following search terms: valproate, valproic acid, carbapenem, ertapenem, meropenem, imipenem, and valproate drug-drug interaction), to obtain clinical studies and case reports reporting on the interaction between VPA and carbapenems. Additionally, a manual search of prominent journals for articles cited in PubMed and Google Scholar was performed. Publications were included up to March 2025 with no lower limit enforced. Model-based simulations for sodium valproate were conducted with RxODE2 (R package) using RStudio.

Results and discussion: Our analysis of 13 pharmacokinetics studies and 15 case reports indicates that carbapenem antibiotics, such as meropenem, ertapenem, and imipenem, can reduce the serum levels of VPA, leading to subtherapeutic concentrations and seizures in certain patients. About a 60–90% increase in VPA clearance was observed. Doses of 465–1 053 mg (10–15 mg/kg/day) were shown to be subtherapeutic for patients taking carbapenems, with doses from 1 227–2 725 mg (25 mg/kg/day) only reaching therapeutic targets, and are most likely to increase the drug's side-effects profile.

Conclusions: In general, it is advisable to avoid the concurrent use of carbapenem antibiotics and VPA derivatives due to the possibility of a drug-drug interaction that causes sub-therapeutic valproate serum levels. Alternative antimicrobial agents should be considered instead of carbapenems; however, if the use of a carbapenem is necessary, an additional antiepileptic is suggested.

Keywords: valproate, simulations, case reports, drug-drug interaction, carbapenem

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CPD questionnaire • Vol 1 • 2026

Ischaemic heart disease: pathophysiology, diagnosis, and therapeutic strategies

1. Stable ischaemic heart disease can include one of the following conditions:

a Unstable angina
b Non-ST segment elevation myocardial infarction
c Printzmetal variant angina
d ST-segment elevation myocardial infarction

2. A key characteristic of the pathophysiology of ischaemic heart disease includes:

a Longstanding hypertension
b Formation of atherosclerotic plaques in the arterial lumen
c Hyperlipidaemia (increased LDL)
d Diabetes Mellites Type II

3. The mainstay of nonpharmacological management and reducing disease progression is a reduction in modifiable risk factors. The most important of these are:

a Cognitive behavioural therapy
b Smoking cessation
c Cardiac rehabilitation
d Regular rigorous exercise

4. Calcium-channel-blockers are indicated for treatment of angina, as they have vasodilatory and cardio-depressant actions. The preferred antianginal calcium-channel-blocker is:

a Amlodipine
b Nifedipine
c Valsartan
d Verapamil

On overview of respiratory tract infections in South Africa

5. Which of the following correctly describes the main difference between upper and lower respiratory tract infections?

a URTIs are typically caused by bacteria, while LRTIs are always viral
b URTIs mainly involve the nasal passages and throat, whereas LRTIs affect the airways and lungs
c LRTIs are always mild, while URTIs frequently lead to hospitalisation
d URTIs affect only children, while LRTIs occur only in adults

6. Which pathogen group was identified as the most prevalent viral cause of respiratory infections in South Africa during the 2025 influenza season?

a Adenovirus, MERS-CoV, and parainfluenza virus
b Rhinovirus, enterovirus, and bocavirus
c Influenza, RSV, and SARS-CoV-2
d Measles virus, rubella virus, and varicella-zoster virus

7. Which of the following best describes the recommended management of most upper respiratory tract infections (URTIs)?

a Immediate antibiotic therapy for all symptomatic patients
b Supportive care with analgesics, decongestants, and hydration, since most cases are viral
c High-dose corticosteroids to reduce mucosal inflammation
d Routine use of antivirals for all suspected URTIs

8. Which diagnostic tool is most commonly used to identify consolidation or infiltrates in suspected lower respiratory tract infections such as pneumonia?

a MRI of the thorax
b Chest radiography
c Spirometry
d Skin prick testing

Is your asthma well managed?

9. Which statement BEST reflects the contemporary definition of asthma control as described in the article?

a Asthma control includes both current symptom burden and future risk
b Asthma control is determined solely by baseline disease severity
c Asthma control focuses only on the absence of acute exacerbations
d Asthma control is achieved when lung function is normal

10. According to multinational survey data discussed in the article, which of the following best describes the asthma control perception gap?

a Most clinicians underestimate asthma control compared to patients
b Most patients accurately assess their asthma control
c Patients and clinicians generally agree on asthma control status
d Most patients perceive good control despite failing objective criteria

11.	**Which Asthma Control Test (ACT) score indicates *well-controlled asthma*?**
a	≤ 15
b	16–19
c	≥ 20
d	≥ 25
12.	**In the sailing analogy used in the article, what does "*constantly adjusting the sails*" represent?**
a	Increasing reliever use during exacerbations
b	Using oral corticosteroids at the onset of symptoms
c	Regular use of preventer medication to maintain control
d	Avoiding all environmental triggers permanently

The evolution of obesity pharmacotherapy from sympathomimetics to incretin-based therapies

13.	**Which of the following drugs exerts its therapeutic effect peripherally by inhibiting gastric and pancreatic lipases, thereby reducing the absorption of dietary fat?**
a	Phentermine
b	Liraglutide
c	Naltrexone/Bupropion
d	Orlistat
14.	**According to the STEP 8 clinical trial, which of the following statements regarding incretin-based therapies is correct?**
a	Liraglutide 3.0 mg daily is more effective than Semaglutide 2.4 mg weekly
b	Semaglutide 2.4 mg weekly demonstrated superior weight loss efficacy compared to Liraglutide 3.0 mg daily
c	Both agents achieved identical mean weight loss percentages
d	Neither agent was effective in achieving more than 5% weight loss
15.	**What is the standard registered duration for the use of centrally acting sympathomimetics like phentermine in South Africa?**
a	Chronic, long-term management
b	Short-term management (up to 12 weeks)
c	Use is limited to a maximum of 14 days
d	There is no restriction on the duration of use
16.	**Tirzepatide represents a shift toward multi-hormonal therapy. What is its primary mechanism of action?**
a	Triple agonism of GLP-1, GIP, and Glucagon receptors
b	Selective blockade of peripheral CB1 receptors
c	Dual agonism of GLP-1 and GIP receptors
d	Inhibition of the dopamine and norepinephrine reuptake transporters

The answers for these CPD questions will be in the upcoming issue of the SAPJ.
This activity can contribute towards your CPD compliance.

CPD answers • November/December 2025

1. c 2. d 3. b 4. b 5. c 6. b 7. c 8. b 9. c 10. c 11. b 12. a
13. b 14. c 15. b

Forum

SA Association of Hospital and Institutional Pharmacists

SAAHIP Pharmacy Month 2025: One profession, many stories of service

Aisha Adam

SAAHIP Pharmacy Month Project Coordinator 2025

Introduction: The spirit of Pharmacy Month

Every year, Pharmacy Month invites pharmacists across South Africa to step into the public eye with renewed purpose. It is a time shaped by education, service and connection. It asks us to go beyond the walls in which we work and make the profession visible to the communities who rely on us. In 2025, the South African Association of Hospital and Institutional Pharmacists (SAAHIP) embraced this invitation with clarity and intention. Guided by the national theme Think Health, Think Pharmacy: One Profession, Many Roles, the organisation launched a coordinated national campaign that sought to highlight the depth, diversity and humanity of hospital and institutional pharmacy.

Campaign scope and objectives

The campaign was designed around two pillars outlined in the national proposal. The first was a school and community outreach programme, a deliberate effort to reach learners in every province, with a special emphasis on marginalised and rural schools. The second was a national digital storytelling initiative that would showcase the full spectrum of pharmacist roles within hospital and institutional pharmacy and foster interprofessional appreciation through collaborative messaging. Together, these components aimed to strengthen public understanding of pharmacy through education, uplift young people, unify branches and elevate SAAHIP's national presence.

Yet what unfolded across the country went further than any project proposal could predict. It became a tapestry of stories stitched together by pharmacists across South Africa who cared deeply about being seen, being understood and being present for the communities they serve. Through school hall conversations, clinical demonstrations, community activations, digital collaborations and national media features, the campaign reached more than six thousand people and became one of the most extensive Pharmacy Month initiatives in SAAHIP's history.

Bringing pharmacy to communities that needed it most

The heart of the campaign lived in the communities it touched. The proposal had called on branches to prioritise schools that lack exposure to pharmacy, and across the country pharmacists honoured that call with empathy and creativity. They travelled to township classrooms, rural high schools and community learning centres where career guidance is rare, and healthcare professions feel distant. They did not arrive as lecturers or representatives but as people who once sat in similar classrooms and carried similar questions about their futures.

Provincial narratives and national reach

Eastern Cape

In the Eastern Cape, this purpose unfolded from the rolling hills of Zithulele and into the towns of Libode and Mdantsane, where branch pharmacists met learners through school outreach and educational sessions. The team shared their own journeys into the profession, speaking about resilience, service and the unseen roles pharmacists play in hospitals. The outreach in this province stretched beyond urban centres and into communities where healthcare careers are often imagined only at a distance.

Northern Gauteng

In Northern Gauteng, the spirit of collaboration defined their approach. Pharmacists joined hands with the student societies, Sefako Makgatho Health Sciences University Association for Pharmacy Students and Tshwane University of Technology Association of Pharmacy Students, creating intergenerational teams who spoke to learners as a unified front. They moved between schools such as Noordwyk and NM Tsunene with an ease that bridged the gap between academic study and professional practice. Learners were not only given information about pharmacy careers, but they were also shown what pharmaceutical sciences look like when students and professionals stand together.

Mpumalanga

Mpumalanga created one of the most memorable expansions of the campaign by extending its reach beyond classrooms. After visiting five schools and engaging more than 1 600 learners, the branch took pharmacy education to the airwaves. On BCR FM, pharmacists explained the value of our profession to an estimated two thousand listeners. Through this radio dialogue, the province brought pharmacy

into homes and demonstrated how outreach can reach far beyond physical spaces.

KwaZulu-Natal inland

In KwaZulu Natal (KZN), branches brought their own signature depth. KZN Inland's programme stretched across hospital corridors, school grounds and community spaces. At Mosvold Hospital, pharmacists held patient education sessions and school visits that touched on Human Immunodeficiency Virus (HIV), Sexually Transmitted Infections (STIs), and medication safety. Community activations at malls allowed teams to speak directly to the public about responsible medicine use. Life Hilton Hospital initiated a month-long internal programme that included clinical talks, vaccine education, interdisciplinary engagement and appreciation activities for staff. The Inland branch also uplifted local learners through fundraising for stationery and food support and ended the month with a wellness hike that reminded pharmacists that caring for communities begins with caring for themselves.

KwaZulu-Natal coastal

KZN Coastal brought similar richness across six major hospitals, where pharmacists moved between clinical departments, schools and community events. Their activities demonstrated that hospital pharmacists occupy a vital space inside the machinery of healthcare and carry expertise that strengthens patient safety and public health. Their engagements with patients, learners and staff showed how embedded pharmacists are within hospital ecosystems and how essential their presence is to collaborative care.

North West

The North West branch carried the campaign into the homes of the elderly, into rehabilitation spaces and into early childhood settings. Through medicine safety sessions at old age homes, addiction prevention dialogues in community centres and health awareness at primary schools and kindergartens, pharmacists emphasised that pharmaceutical care touches every stage of life. The work in this province showed that pharmacy does not exist in one environment but flows into families, classrooms and support systems across generations.

Western Cape

In the Western Cape, the message of Pharmacy Month took the form of visual storytelling. Clinical pharmacists featured in educational videos that unpacked hospital roles with clarity and professionalism. Displays at Netcare Blaauwberg made the often-invisible structures of pharmacy visible to hospital staff and the public. Through digital and physical storytelling, the province positioned pharmacists as integral to clinical decision making and patient safety.

Limpopo

Limpopo brought together academic energy, clinical expertise and community centred health messaging. Their collaboration with the University of Limpopo Association of Pharmacy Students, hospital teams and community health partners illustrated how pharmacy is strengthened when students, clinicians and rural communities stand in conversation with one another. Their antimicrobial stewardship symposium added an additional layer of scientific engagement to the campaign, ensuring learners and community members were exposed to both the art and science of pharmacy.

Southern Gauteng

Southern Gauteng, with its fully digital approach, carried the campaign's purpose into the online world. Their educational content brought pharmacy to the screens of the public, ensuring that those who could not attend outreach events could still learn about hospital roles, medicine safety and the value of clinical pharmacy. Their posts contributed to the national digital engagement increase of 129.7 percent and ensured SAAHIP's message remained active and accessible throughout the month.

Northern Cape and Free State

In the Northern Cape and Free State, one of the most dynamic contributions emerged. The branch co-hosted an Instagram Live in partnership with the Northern Cape Department of Health. More than a thousand people joined the conversation as pharmacists discussed their roles across facilities and levels of care. It became a national moment of unity and transparency, showcasing that pharmacists are key contributors to the healthcare system.

Across all these branches, a shared truth took shape. Pharmacy does not live behind a counter. It lives in communities. It lives in conversations. It lives wherever education and care meet.

Digital storytelling and national visibility

The second pillar of the campaign brought pharmacy to national audiences. The One Hospital, Many Pharmacists campaign showcased the wide range of roles that sustain hospital systems, from oncology to procurement, from ward based clinical services to pharmacovigilance. The Know Your Pharmacist challenge brought nurses, doctors and other professionals into the conversation, allowing them to highlight what pharmacists contribute to patient care. This public endorsement strengthened interprofessional appreciation and built trust with the communities watching.

SAAHIP also increased national visibility through the Expresso Morning Show feature, the presidential campaign opening message, the World Pharmacists Day messaging in alignment with the FIP campaign and the relaunch of the SAAHIP website. These initiatives extended the reach of Pharmacy Month beyond provincial borders and into national media spaces.

What this campaign means for pharmacists

Pharmacy Month 2025 was not simply a project carried out by branches. It reflected who pharmacists are and how deeply we care about the communities we serve. It showed learners that a pharmacist can be a teacher, a researcher, a clinician or a steward of safe medicine use. It showed communities that pharmacy is accessible, and people-centred. It showed healthcare workers that pharmacists bring critical decision making to every level of care.

What this campaign means for SAAHIP

For SAAHIP as an organisation, the campaign marked a significant milestone. It demonstrated that all branches can work together

under a unified national strategy. It strengthened relationships between pharmacy students, professionals, healthcare facilities, the Department of Health and the public. It provided evidence that SAAHIP can coordinate national initiatives with measurable impact and meaningful public engagement. It deepened organisational identity and created a sense of shared purpose across the country.

Conclusion

Most importantly, it reaffirmed that when South Africa thinks about health, the profession of pharmacy must be part of that landscape. The 2025 campaign reminded the country that pharmacists are not only custodians of medicines but custodians of safety, access, education and care.

Pharmacy Month 2025 strengthened the profession, touched approximately six thousand lives and positioned SAAHIP as a national leader in public education and professional advocacy. It was a demonstration of unity, service and collective pride. And it leaves a legacy that branches can build on in the years ahead.

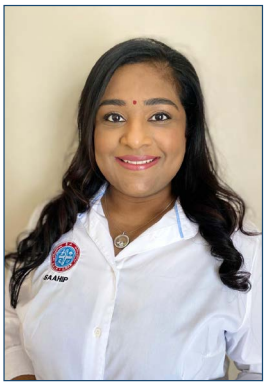
Acknowledgments

This national campaign was conceptualised and led by the Membership, Marketing and Media (MMB) focus area of SAAHIP. The project was driven by Pharmacy Month Project Coordinator Aisha Adam, Eastern Cape Branch & MMB Chair Robyn Wates, SAAHIP President Seshnee Moodley, and the dedicated MMB team: Andiswa Memani, Duran Thomas, Thendo Tshingowe, Sameshin Reddy, Elizabeth Mkhabela, Shaista Nabee, Solofelang Matshidiso, and Kutullo Letuku.

'An ounce of prevention is worth a pound of cure" – Benjamin Franklin'

Dr Seshnee Moodley

President, SAAHIP



In my previous write-ups I reminded pharmacists of striving to do their best whilst performing their professional responsibilities, aiming to be ten-star pharmacists. We need to own our space and ensure that our role as the custodian of medicine is maintained. This sets us apart from the rest of the healthcare team but also ensures that we are valued for our contribution. As medicine experts, it is our responsibility to ensure that all medicine provided to the patient has the desired or intended effect and the therapeutic goal is achieved.

As my traditional role of pharmacist evolved into an administrative role of quality assurance and medical litigation manager at the beginning of 2025, I became more involved in patient safety and the culture of reporting these events throughout the facility, whilst also trying to improve patient safety systems and guidelines. Patient harm is a global priority and death due to patient harm is one of the top 10 causes of death and disability worldwide. Besides harm to the patients, compromised patient safety contributes to escalating hospital expenditure. Globally there is a patient safety action plan developed by the World Health Organisation 2021 – 2030 and the South African public sector has nationally implemented a patient safety guideline in 2022, which all government facilities need to adhere to.

Patient safety incidents (PSI) are defined as an unplanned or unintended event that did or has the potential to result in harm to the patient, while the patient is within the healthcare facility. These PSI events can be categorised as no harm, near misses or adverse/harmful events. There is a misconception that nurses or doctors are the only healthcare workers responsible for patient safety. The overall patient journey involves medication at some point and therefore patient safety is key when dealing with medication. The medication cycle within a hospital facility starts at procurement to the dispensing to the patient at the outpatient pharmacy or dispensing to the ward, which culminates in administering medication to the patient, by the nursing team. Medication errors can be made by anyone involved in the patient care process and we are all responsible for reporting these events. Medication errors may have dire consequences for the patient, and sometimes may lead to litigation cases, costing facilities and governments a lot of money.

The National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP) in the United States defined a medication error as a preventable event that may result in inappropriate medication use or cause harm to a patient while the medication is under the control of a healthcare professional, patient, or consumer (2000). As the role of the pharmacist moves away from just dispensing in the pharmacy to more ward-based pharmacy practice, there is more patient interaction at the bed side. This interaction allows for more meaningful prescription assessments and medicine reconciliation which may allow the pharmacist to be best positioned to rationalise the prescription, advise on drug monitoring and to highlight potential or actual drug-drug or adverse reactions or PSIs. Pharmacists need to get into the culture of leaving the dispensaries and attending to patients at their bedsides. Pharmacists need to be more involved in ward rounds and reporting these PSI medication error related events, which will allow the facility to identify trends and types of these errors and allow for mitigation strategies to be implemented.

Medication errors are a type of PSI and have grave consequences. As pharmacists, we need to ensure that the patient's best interests stay at the forefront, by adhering to policies and guidelines and ensure that the 5 Rs are practised i.e. right patient, right drug, right dose, right time and right duration. As a pharmacist, you are the last line of defense to prevent a tragic event that may occur in the patient due to an adverse event. The NCCMERP highlighted that these med errors/PSIs may occur at any stage of the medication administration process i.e. prescribing, preparation, storage, administration and monitoring with the different types of errors including wrong patient, wrong drug, wrong time, wrong dose, wrong route, wrong dosage form, dose omission, wrong frequency, unprescribed drug, extra dose, incorrect labelling, etc.

Reports generated from these PSIs can be used to highlight trends and improve systems. The landscape of healthcare and pharmacy is continuously evolving, and these systems have been able to assist in minimising potential medication errors/PSIs. However human oversight and interaction is still needed and that is why pharmacists are best positioned to ensure that these PSIs are avoided. Pharmacists can offer evidence-based counselling to patients and may also equip the nursing team with skills on proper medication administration to patients in the ward. The hospital pharmacists may also develop training programmes for nurses on medication administration and how to avoid medication related PSIs. The overall PSI reports may be used to motivate for additional staff, improved patient outcomes, cost minimisation, reduced hospital expenditure and improvement of hospital policies and guidelines. I therefore urge us pharmacists to start being proactive and practice pharmacy preventatively rather than reactively. Focus on implementing proactive measures that will avoid PSIs, which ultimately will benefit the patient and have a positive impact on the health system.

SkipTheQ: Leveraging Digital Innovation to Strengthen Pharmacy Operations and Reduce Waiting Times in a Public Tertiary Hospital

Bandela B. Mgoqi

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Based on the presentation which was awarded the Best Scenario Award at the 37th Annual Conference of the South African Association of Hospital and Institutional Pharmacists (SAAHIP)

Abstract

Long waiting times remain a persistent challenge in South African public sector pharmacies, undermining patient satisfaction and efficiency. At Kalafong Tertiary Hospital, a high-volume facility serving approximately 1000 patients daily, average waiting times reached 120 minutes, double the provincial benchmark of 60 minutes. Contributing factors included limited human resources, reliance on manual dispensing systems, and patients being ineligible for alternative distribution models, such as the Centralised Chronic Medicines Dispensing and Distribution system (CCMDD) or DAPLAPMEDS. In March 2024, the hospital pharmacy department introduced SkipTheQ, a digital booking system accessible via a mobile app, web platform and WhatsApp. The platform allows patients to schedule collection slots, enabling pharmacy staff to pre-pack prescriptions in advance. Since implementation, waiting times have dropped to 50.5 minutes, with over 6500 patients registered and more than 15 250 appointments served. Patient feedback has been overwhelmingly positive, and staff report improved workload distribution. This experience demonstrates that low-cost, digital innovation can strengthen operational efficiency, improve patient experience, and align pharmacy services with broader health system goals.

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Background and problem statement

Kalafong Tertiary Hospital, located in Atteridgeville, Pretoria, dispenses prescriptions for approximately 1000 patients daily. Prior to 2024, the Out-Patient Department Pharmacy struggled with overcrowding, inefficient manual processes, and insufficient human resources. Waiting times averaged 120 minutes, double the provincial target.[1]

The bottlenecks stemmed from three main issues: dependence on manual folder retrieval, staff shortages, and patients being ineligible for alternative access programmes such as CCMDD or DAPLAPMEDS.[2,3] Many patients required complex regimens or medicines outside standard formularies, leaving them dependent on the hospital pharmacy. This created an urgent need for a sustainable operational innovation to reduce waiting times, improve efficiency, and restore patient trust.

Rationale for innovation

Expanding human resources was not a feasible short-term solution. Programmes like CCMDD and DAPLAPMEDS provided relief for some, but many patients remained tied to facility-level collections.[2,3] Overcrowding, long queues, and patient dissatisfaction persisted. SkipTheQ was conceived to complement existing programmes by streamlining pharmacy operations for patients excluded from these alternatives.

The intervention aligned with Batho Pele principles by emphasising consultation, service standards, and access.[4] Patients could now book appointments online or through WhatsApp, giving them greater control over their care. For the pharmacy, pre-packing prescriptions ahead of time redistributed workloads, reduced peak-hour congestion, and improved efficiency. Similar to findings from other South African initiatives, this type of operational redesign enhances resilience in pharmacy services.[5] Importantly, the system required minimal financial investment, relying on basic digital tools integrated into existing workflows.

The SkipTheQ intervention

SkipTheQ is a digital appointment booking platform with dual access points: Internet and WhatsApp. Patients booking online receive an automated reference number and confirmation. WhatsApp requests are entered by an administrative clerk to accommodate those with limited digital literacy. The promise to patients was: "Collect your chronic medication in 15 minutes or less".

Bookings are made at least seven days in advance to allow folder retrieval. Two days before collection, staff generated a patient list and pre-packed medicines. On collection day, patients presented their reference number and were served within minutes. The system was integrated with existing workflows without requiring additional staff.

The target groups included patients who were excluded from CCMDD or DAPLAPMEDS and those unable to spend hours queuing, such as employed individuals and caregivers. By focusing on this cohort, the platform reduced pressure on frontline staff and queues, while improving patient dignity and access. Research shows that integrating digital tools into service delivery is increasingly recognised as a strategy to improve health system performance in low- and middle-income settings.[6,7]

Results and operational impact

The project was launched on 8 March 2024. Within 18 months, over 6500 patients registered and more than 15 250 appointments were booked. Demand was so strong that slots extended into October 2025. Average waiting times fell from 120 minutes to 50.5 minutes, surpassing the provincial target of 60 minutes.[1]

Patients expressed relief at avoiding queues, with some sending a personal email of thanks. Employed patients valued the ability to integrate collection into work schedules, while elderly caregivers appreciated the reduced strain. Staff reported less stress, as peak-hour congestion decreased and workloads were redistributed. Pre-packing during quiet periods created smoother operations and fewer patient complaints.

The intervention also improved hospital performance metrics, directly contributing to meeting provincial service delivery standards. Similar to findings in other studies, targeted operational changes can significantly reduce inefficiencies in medicine access while improving patient satisfaction.[5,8]

Health system strengthening dimension

SkipTheQ reinforced core Batho Pele principles. Patients were consulted through flexible booking options; service standards improved by consistently meeting waiting time benchmarks; access and courtesy were enhanced through shorter queues and calmer environments. The intervention offered significant value for money, implemented at minimal cost.[2]

By targeting patients outside CCMDD and DAPLAPMEDS, SkipTheQ complemented rather than duplicated existing programmes.[2,3] It strengthened resilience by enabling facilities to adapt to demand without additional staffing. Importantly, it aligns with the goals of National Health Insurance (NHI) by demonstrating that patient-centred, technology-driven innovations are feasible in resource-limited settings.[9] Its scalability is high, given the reliance on widely available digital tools and minimal infrastructure.

Challenges and lessons learned

Several challenges emerged.

First, reliance on manual record systems sometimes delayed folder retrieval, highlighting the broader need for digitised health records.[6]

Second, patient digital literacy varied. While the web-based platform automated bookings, many relied on WhatsApp, requiring administrative support and increasing workload. Flexibility ensured inclusivity but added complexity.

Third, staff buy-in required strong change management. Some initially feared increased workload or errors in pre-packing. Through training and demonstration of benefits, staff became active supporters.

Fourth, minimal infrastructure limited advanced features such as real-time stock integration.

Finally, equity considerations were critical; patients with higher digital literacy adopted quickly, raising concerns of a "two-tier" system. Monitoring and support mechanisms were necessary to ensure fairness.

The key lesson is that digital innovation must be inclusive, supported by strong change management, and aligned with broader system reforms such as digitisation of records and infrastructure investment.[5,7]

Conclusion

SkipTheQ demonstrated that low-cost, patient-centred digital innovation can significantly improve efficiency and patient experience in public hospital pharmacies. By reducing waiting times below provincial targets, the system restored dignity for patients and eased pressures on staff. Its rapid adoption shows both demand and scalability.

More broadly, the project strengthened health system performance by aligning with Batho Pele principles, complementing existing programmes, and demonstrating readiness for NHI reforms. While challenges remain, manual record dependence, digital literacy gaps, and infrastructure limitations underscore the importance of continued innovation and investment in digital health.

Ultimately, SkipTheQ is not just a local success but a replicable model. It illustrates how pharmacists, through leadership and creativity, can harness technology to solve persistent operational challenges, advancing both efficiency and equity in patient care.

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Pharmacy Month 2025: "Think health, think pharmacy - one profession, many roles

During Pharmacy Month at Life Wilgers Hospital, we honoured the vital role pharmacists play in the healthcare system. With the theme "Think Health, Think Pharmacy - One Profession, Many Roles," we highlighted the diverse contributions of pharmacists in ensuring the well-being of individuals and communities.

Pharmacists are more than just medication dispensers; they are healthcare professionals who provide expert advice, support, and care to patients. From dispensing medications to offering health screenings and consultations, pharmacists are integral to the healthcare team.

The Many Roles of Pharmacists briefly summarised:

- *Patient Care:* Pharmacists work closely with patients to understand their medication regimens, provide counselling, and monitor their health.
- *Healthcare Advocates:* Pharmacists advocate for patients' needs, ensuring they receive the best possible care and support.
- *Medication Experts:* Pharmacists are skilled in medication management, providing guidance on safe and effective use.
- *Community Leaders:* Pharmacists play a vital role in promoting public health initiatives and health awareness campaigns.
- *Innovators:* Pharmacists contribute to the development of new medications, therapies, and healthcare solutions.

At Life Wilgers Hospital we believe that empowering patients will enhance their health.

By recognising the value of pharmacists, we can work together to create a healthier society. As healthcare evolves, pharmacists are poised to take on even more critical roles, from managing chronic conditions to providing point-of-care testing.

As we conclude Pharmacy Month 2025, let's continue to "Think Health, Think Pharmacy" and acknowledge the many roles pharmacists play in keeping our communities healthy and thriving.

Pharmacy Month Life Wilgers Hospital

- ***Week 1***

Theme: "BOK" Friday

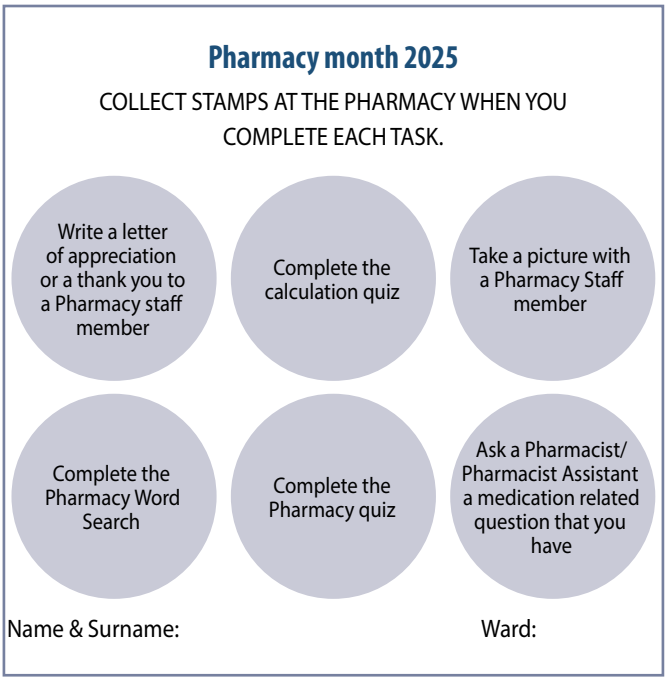
Kicking off Pharmacy Month with a bang. During the first week we celebrated the unsung heroes of the pharmacy team – The stock controllers, store assistants, invoice clerks and porters.

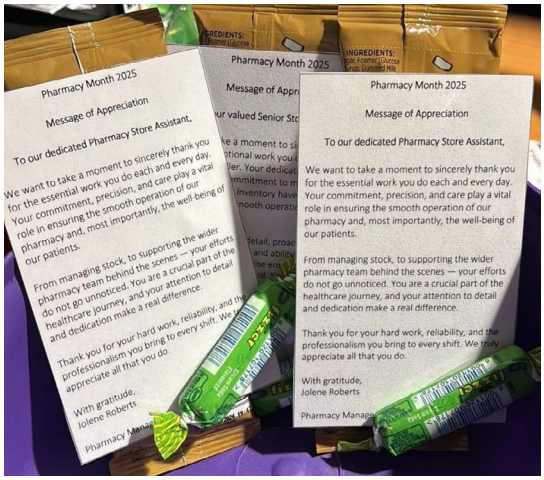
They're the backbone of our operations, ensuring that our Pharmacy runs smoothly and efficiently. From managing stock to delivering medications, they're the ones who keep our pharmacy moving.

In addition, we launched our Pharmacy Month "Passport":

Nursing staff were encouraged to participate in this fun initiative. During the month of September they had to complete 6 tasks:

- Write a letter of appreciation or a thank you to a pharmacy staff member
- Complete the calculation quiz
- Take a picture with a pharmacy staff member
- Complete the pharmacy word search
- Complete the pharmacy quiz
- Ask a pharmacist or pharmacist's assistant a medication related question that you have
- Each week the different individuals received a message of appreciation bookmark showcasing their hard work and dedication.





- ***Week 2***

Theme: "Rainbow Nation"

During the second week we shined the spotlight on our amazing interns and pharmacist's assistants. As part of our "Think Health, Think Pharmacy – One Profession, Many Roles" theme, we celebrated the diverse roles that make our pharmacy tick.

Our theme was "Rainbow Nation", and we embraced the colours and vibrancy of our team.

- In addition, the wards were challenged to create a Slogan to describe Pharmacy.
- IPC also assisted with an awareness table discussing Standard Precautions where staff members and the public were able to interact and ask those important questions.
- The winners of the Slogan competition were announced and awarded with Lunch: *Slogan: "Compassion in every dose, care in every moment"*

- ***Week 3***

Theme: "Superheroes"

During the third week we shined the spotlight on the incredible diversity of roles within our profession. From retail to hospital and clinical pharmacy, our superheroes are dedicated to delivering exceptional patient care and promoting health and wellness in their communities.

The Pharmacy Superheroes include:

Retail pharmacists: *The Community Champion*

Dispensing more than just medication, retail pharmacists are trusted advisors, providing personalised health advice and support to patients every day.

Hospital pharmacists: *The Medication Mastermind*

Working behind the scenes, hospital pharmacists ensure the safe and effective use of medications, optimising patient outcomes and saving lives.

Clinical pharmacists: *The Patient Advocate*

Clinical pharmacists are the ultimate patient advocates, using their expertise to tailor medication regimens and improve health outcomes.

At the heart of it all, pharmacists are dedicated healthcare professionals who wear many hats. Whether in retail, hospital, or clinical settings, our superheroes are united in their commitment to delivering exceptional patient care and promoting health and wellness.

In addition, we also arranged for the Dispensary staff to have an outreach to the Oncology Pharmacy on the premises. Our outreach was enlightening and we learned about the vital contributions pharmacists make in cancer care.

This visit also highlighted the importance of interdisciplinary collaboration in patient care.

- ***Week 4***

Theme: "Celebrating our Roots, Honouring our Future"

For the Pharmacy Month finale we celebrated our Pharmacy Manager with a special shout out video of appreciation from the staff.

The Pharmacy Manager is the driving force behind:

- **Operational Excellence** – Ensuring seamless pharmacy operations.
- **Team Leadership** – Guiding pharmacists and pharmacist's assistants to deliver exceptional patient care.
- **Strategic Innovation** – Driving growth, efficiency, and patient-centred services.

We celebrated the dedication, expertise, and leadership of our Pharmacy Manager in shaping the future of healthcare.

Cum Laude

Academy of Pharmaceutical Sciences

Pharmacy Students' Lived Experiences of Mental Health Support Structures at Rhodes University

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Nqobani is the joint winner of the Young Scientist Award in Pharmacy Practice and Clinical Pharmacy awarded at the APSSA Conference in 2025

Abstract

Student mental health has become an urgent concern in South Africa, particularly within higher education settings, where academic pressure, social stresses, and structural inequalities intersect. Pharmacy students face a distinct set of challenges related to the intensity of their programmes and the expectations associated with professional competence. This qualitative study explored the lived experiences of pharmacy students regarding mental health support structures at Rhodes University. Using a phenomenological approach, data were collected through document analysis of nine institutional texts and semi-structured interviews with twenty undergraduate and postgraduate students. Thematic analysis demonstrated the absence of a formal mental health policy, limited visibility and accessibility of services, and the persistence of cultural and gendered stigma. Peer networks emerged as crucial sources of informal support and resilience. The findings highlight the need for a comprehensive, culturally responsive mental health strategy that integrates student well-being into academic and institutional practices.

Keywords: Student mental health, phenomenology, support structures

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Introduction

Mental health challenges among university students have intensified globally, and South Africa reflects similar, if not heightened, trends.[2,17] Financial insecurity, social isolation, and academic overload contribute to elevated levels of anxiety and depression on campuses nationwide.[15,20] In the Eastern Cape, these pressures are compounded by limited resources, infrastructural constraints, and socioeconomic inequalities, which further complicate access to support.[13,18]

Pharmacy students represent a particularly vulnerable group within the higher education sector. The rigorous nature of pharmacy education, which demands theoretical mastery, clinical competence and professional readiness, creates sustained psychological strain.[7,19] Students frequently report persistent fatigue, emotional distress and fear of underperformance, all of which may discourage help-seeking behaviour and perpetuate distress.

Despite a growing discourse around student wellness, limited empirical research examines how pharmacy students engage with institutional support structures. Existing studies in South Africa often aggregate student experiences across disciplines, obscuring the distinct realities of those in the health sciences.[7] This study, therefore, examined the lived experiences of pharmacy students at Rhodes University, identifying gaps between policy and practice and exploring available support structures. By engaging directly with pharmacy students' accounts, it aimed to provide context-specific insights to the emerging literature on mental health in higher education.

Methods and data collection

This study employed a qualitative, phenomenological design to understand the meaning and depth of students' lived experiences. The approach was underpinned by the Health Policy and Systems Research framework[10] and supported by anthropological insights into health, culture and meaning.[6,8,11] Phenomenology enabled an exploration of how students perceive, interpret, and respond to mental health and available support structures.[12]

Two complementary sets of data were collected. Firstly, a document analysis of nine institutional texts, including wellness protocols, policy documents, official statements and student support manuals, was conducted to examine the structure and intent of mental health provision at Rhodes University. Secondly, semi-structured interviews were conducted with twenty pharmacy students across all undergraduate and postgraduate levels. Participants were recruited through faculty mailing lists and short in-class invitations. Interviews explored students' perceptions of available support services, their experiences of seeking help, and the barriers they encountered.

Data analysis and ethics

All the interviews were recorded, transcribed verbatim and coded both inductively and deductively. Data was analysed using a six-phase

thematic analysis framework.[3] Coding proceeded iteratively, moving between data immersion, pattern recognition, and theme refinement.

Ethical clearance was granted by the Rhodes University Ethics Committee. Participation was entirely voluntary, and participants were assigned pseudonyms to protect their anonymity. Rigour was strengthened through reflexive engagement, supervisory debriefings, member checking and triangulation between the document analysis and interview data.

Results

The following results present the thematic findings derived from interviews with pharmacy students regarding their experiences of mental health and support within the university context:

Student perspectives and experiences of academic pressure

Pharmacy students consistently described academic pressure as the most significant factor affecting mental health. The programme's demanding workload, frequent assessments, and rapid pace left many feeling overwhelmed, emotionally fatigued, and disconnected from their personal well-being, with one student noting that "we tend to lose ourselves in the process" (UG2-3).* Participants reported sacrificing sleep, meals and social time to cope with academic expectations, with some experiencing acute emotional distress during peak assessment periods. While academic support is provided in the early years, participants noted that emotional well-being receives little explicit attention thereafter. This disconnect reinforces a culture in which distress is normalised and students feel solely responsible for managing their struggles.

Support-seeking behaviours

Support seeking was shaped by cultural, gender, and social influences. Participants from various African backgrounds described growing up in contexts where mental illness was stigmatised and help-seeking associated with weakness or "madness". Male students in particular emphasised early socialisation that discouraged vulnerability and encouraged emotional restraint, with one noting that "you just go through it… you cannot be vulnerable" (PG5)[1]. These norms often prevented them from approaching mental health services even when distressed. Some students preferred counsellors who shared their cultural or linguistic backgrounds, explaining that shared context improved comfort and therapeutic rapport. Others relied on spiritual practices such as prayer before considering clinical services. These findings demonstrate that help-seeking is embedded in broader social and cultural narratives rather than individual choice alone

Service accessibility and support-seeking barriers

Although formal services were available, students frequently encountered barriers, including long waiting lists, delayed responses, and limited session allocations. Some reported only receiving appointments weeks or months after requesting support. Delayed responses meant that for some, support arrived only after the crisis had passed, leaving them feeling that "it did not feel very useful" (PG3).[1] The COVID-19 pandemic further disrupted access, with online counselling perceived as impersonal and less effective. Resource constraints, staff turnover, and procedural challenges, such as navigating academic concessions, further weakened trust in institutional services. As a result, some students disengaged from the university counselling centre altogether and sought private therapy instead.

Visibility experiences and relevance of support structures

Awareness of mental health resources varied widely. Some students learned about the counselling centre through emails or word of mouth, while others were unaware of its location or purpose, with one noting, "I've heard there is a place, but I don't know where it is" (UG2-1).** Although some students described positive counselling experiences, others reported receiving insufficient support, experiencing a cultural disconnect, and a lack of continuity due to staff changes. Symbolic initiatives such as "mental health benches" were viewed as insufficient and poorly aligned with students' needs.

Campus climate and institutional culture

Students perceived the university as prioritising academic performance over emotional well-being. Many were unsure where to seek help within the faculty and described institutional responses to mental health crises as inconsistent or lacking meaningful follow-through, with one student observing that "they could do a whole lot better" (UG3-4)[2]. Although several initiatives exist, participants argued that the university needs more culturally responsive, well-resourced, and visible mental health strategies to address its ongoing challenges effectively.

Discussion

The findings revealed a disjuncture between institutional intentions and students' lived realities. The absence of a formal university mental health policy contributes to inconsistent and reactive approaches that leave students uncertain about available support. This aligns with broader South African evidence demonstrating that wellness programmes often exist but lack cohesive implementation.[1]

The cultural and gender stigma identified in this study echoes trends elsewhere in sub-Saharan Africa, where emotional vulnerability is frequently equated with weakness.[14] Without targeted engagement with these underlying social narratives, institutional interventions are likely to have limited impact. Awareness campaigns should therefore move beyond information dissemination towards culturally grounded dialogue and community participation.[5]

Peer networks emerged as a significant underutilised resource. Their accessibility, empathy, and shared experience make them effective first points of contact.[16] Strengthening these networks through trained peer mentors, introducing psychological first aid, or structured residence-based programmes could strengthen the university's support system.

* These quotes come directly from student interviews, and the key is as follows: UG2-3 is 2nd Year Undergraduate participant 3, PG5 is Postgraduate participant 5, PG3 is Postgraduate participant 3

** These quotes come directly from student interviews, and the key is as follows: UG2-1 is 2nd Year Undergraduate participant 1, UG3-4 is 3rd Year Undergraduate participant 4

For pharmacy education, the implications extend beyond student welfare. Preparing future pharmacists requires nurturing professionals capable of empathy, resilience and patient-centred care.[9] Institutions that foster a supportive and responsive environment help shape graduates who are better equipped to manage occupational stress.[4] Integrating mental health literacy into the pharmacy curriculum could therefore have long-term professional benefits.

Recommendations

Drawing from the findings, several strategies are proposed:

- Develop a comprehensive university mental health policy outlining institutional responsibilities, coordination mechanisms, and crisis-response protocols.
- Integrate mental health awareness, self-care and emotional intelligence into the pharmacy curriculum to build professional resilience.
- Improve communication and visibility of counselling services through orientation programmes, departmental briefings, and digital platforms.
- Expand counselling capacity through hybrid delivery models, including online sessions and group workshops, to manage demand.
- Strengthen peer-led initiatives by training student mentors to identify distress and provide appropriate support.
- Foster cross-departmental collaboration to ensure that mental health is embedded across institutional structures rather than being confined to Wellness offices.

These recommendations align with global best practices and can be adapted to the social and cultural realities of South African higher education.

Conclusion

This study offers insight into the lived experiences of pharmacy students navigating mental health support at Rhodes University. Despite institutional commitments to student welfare, gaps exist between policy intentions and students' everyday realities. Stigma, limited awareness and accessibility challenges appear to undermine the effectiveness of support provided. Nevertheless, students demonstrate resilience and agency through strong peer networks. By embedding mental health within academic culture, developing cohesive policies, and valuing students' voices, universities can foster a more responsive and compassionate university environment. These findings contribute to the limited body of literature on student mental health in South African higher education, highlighting the importance of culturally grounded, student-centred approaches.

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[#]the only dexlansoprazole available in South Africa. **DDR:** dual delayed-release; **PPI:** Proton pump inhibitor; **QoL:** quality of life.

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