PM Healthcare
PROGRESS THROUGH PARTNERSHIP

JOURNAL

Incorporating *The Journal of Pharmacy Management* and *The Journal of Medicines Optimisation*

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Highlights:

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PROGRESS THROUGH PARTNERSHIP

Editorial

In our summer Journal (though it hardly feels like summer…) we have seven varied articles, which I hope you will find interesting, useful and helpful – contributing to our objective of bringing you insightful and relevant content that translates into best practice and shared experiences.

We have three informative workforce articles: Preeti Minhas describes the portfolio career route for pharmacy, and how this approach can lead to rewarding opportunities and success; Farzana Mohammed tackles the subject of race microaggressions, and how these can be identified, challenged and resolved through training and awareness; and, Jen McCutcheon looks at pharmacist priorities in primary care network, discussing how the changing NHS has presented this reasonably new care model with prospects, challenges and solutions.

In our three clinical articles: Michael Smith describes how in Scotland he has successfully brought clinical care closer to those with Inflammatory Bowel Disease; Mike Wilcox provides a review of adherence to NICE criteria for initiation of treatment with romosozumab in severe osteoporosis; and, Saran Braybrook shows how primary care pharmacy technicians support the goal of NHS sustainability by reducing carbon inhaler use.

And in our sponsored article, Giovanni Cucinotta provides a comparative analysis of the capillary blood glucose monitoring systems recommended by NHS England guidelines.

It would be remiss not to mention the recent General Election, which has provided us not only with a new government, but also a new ministerial team at the Department of Health and Social Care. Wes Streeting, the capable and enthusiastic new Health Minister, has lost no time setting his stall out. The NHS is 'broken' and in need of a radical overhaul – already he has asked NHS reform veteran Lord Darzi to report on the health service with a view to creating a new 10-year recovery and improvement plan.

Welcoming any changes that will benefit the NHS, and pharmacy in particular, there is, of course, an inevitable sense of déjà vu about the prospect of further structural reforms, similar in proposal to those enacted in the past. However, now is not the time to be cynical, but instead to look with optimism on a new regime that has started well by at least recognising the enormity of the challenge it faces. Time, as they say…

As ever, please contact me with any ideas you have for articles and experiences you would like to share. Also, if there is a subject area that you would like to see covered in the Journal, perhaps in a special edition, do not hesitate to get in touch.

John Chater
Editor – PM Healthcare Journal
E: editor@pmpublications.co.uk

Embracing Portfolio Careers: A Prescription for Success in Pharmacy

Preeti Minhas,
Director of Clinical Development.

MRPharmS PGCert Clinical Pharmacy PGCert in Learning and Teaching in Clinical Practice Independent Prescriber.

Email: P.Minhas@educationforhealth.org

About the author

After earning her pharmacy degree and holding several managerial roles in community pharmacy, Preeti changed focus to ensure that healthcare professionals had the necessary knowledge and skills to achieve quality patient outcomes. Driven by this passion, she transitioned into learning and development roles, focusing on the education and training of pharmacy professionals. She also represented her organisation at the Company Chemist Association (CCA) workforce development group. Preeti then advanced to her current position as the Director of Clinical Development at Education for Health.

In her current role, Preeti is responsible for the clinical development of a portfolio that includes higher education courses at degree, diploma, and master's levels, as well as continual professional development programs. She has played a key role in delivering national-scale programs in partnership with the NHS and industry to achieve quality patient outcomes. Additionally, Preeti represents the organisation in external groups to shape policies and guidelines, such as the Breathlessness Pathway and the COPD Malnutrition Pathway. She also co-chairs the Alliance for Heart Failure, a coalition of industry partners and the NHS.

Committed to her own learning, Preeti completed a postgraduate certificate in clinical pharmacy, a postgraduate certificate in learning and teaching in clinical practice, and recently qualified as an independent prescriber, helping her diversify her career. Her belief that better patient care comes from having the right people in the right roles with the right skills has propelled her to thrive as a leader in the healthcare sector.

Starting out and getting on...

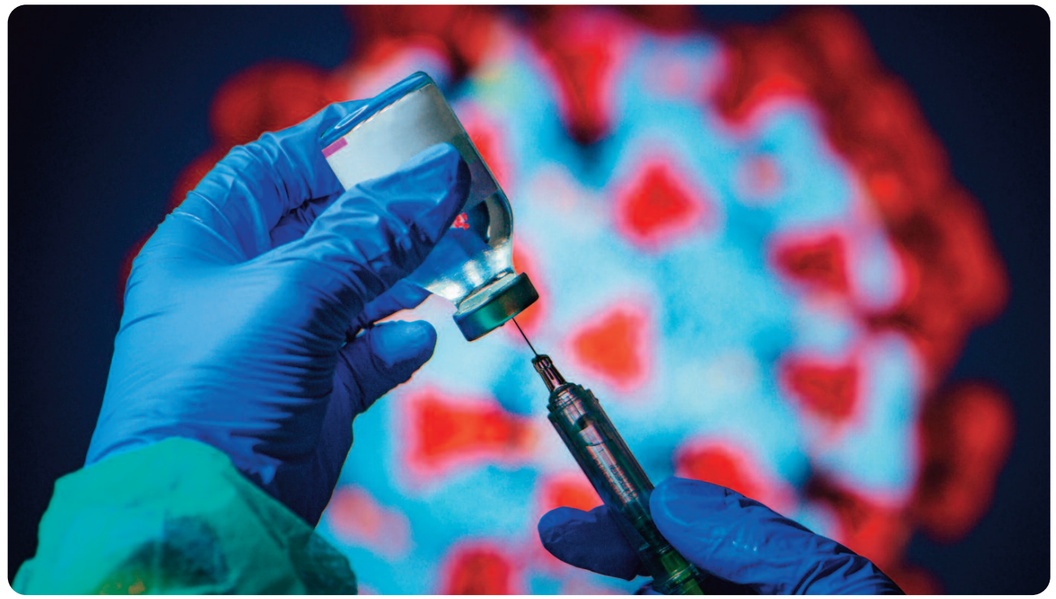
Most of us have followed a linear education pathway – we completed our GCSEs, then A-levels, and then our undergraduate degree. With each step successfully completed, we ascended to the next academic level. However, once we enter the world of work our career becomes less than linear, perhaps more like a game of Snakes and Ladders. In some cases, we may get a sought-after promotion, in others we may take a sideways career step or, as it sometimes seems, feel like we are taking a step back.

Whatever our trajectory, it is important to view each of these chapters as an opportunity to develop and build our individual 'toolkit'. The toolkit needs to have within it the necessary knowledge, skills and behaviours that enable you to meet the needs of your current role, as well as prepare you for the future. Increasingly, the roles we take may no longer follow a 'traditional career' trajectory as the path to success but may instead follow the portfolio approach. It makes sense to ask then, 'What are portfolio careers and why are they important in the pharmacy profession?'

What are portfolio careers?

As defined by Health Education England:

> *'Portfolio careers are usually built around a collection of skills and interests, though the only consistent theme is one of career self-management. With a portfolio career you no longer have one job, one employer, but multiple jobs and employers within one or more professions.'*[1]



Why are portfolio careers important in today's world?

Impact of the COVID-19 pandemic

The COVID-19 pandemic presented many challenges and opportunities in healthcare. We saw an increase in waiting times for diagnostics and elective care, increased workforce challenges, cancellation of non–urgent treatment – all of which created a significant amount of pressure on an already stretched NHS system.[2]

A consequence of this was a need for greater mobility in healthcare provision, with healthcare professionals having to adapt to different working conditions and environments. The residual effect of this has been a re-evaluation of what is and is not possible in provision and broader workforce opportunities.

Ageing population and ongoing workforce challenges

Moving forward, with an ageing population who have an increasing number of long–term conditions, as well as ongoing workforce challenges in the NHS, it is vital we can utilise the skills and knowledge of healthcare professionals from different disciplines to deliver quality outcomes for patients.

The role of pharmacists and their pharmacy teams is now seen as pivotal in supporting the NHS to overcome many of these challenges. The introduction of services such as case finding hypertension, Pharmacy First and the Additional Roles Reimbursement Scheme, has now opened opportunities for pharmacists and their teams to diversify their skills, interests and income streams.

ICSs embracing a partnership approach

In November 2020, NHS England published *Integrating Care: Next Steps to Building Strong and Effective Integrated Care Systems Across England.* This new trajectory highlighted the core purpose of an integrated care system (ICS) as helping the NHS support broader social and economic development in local communities, particularly key due to the impact of the pandemic, the need to tackle healthcare inequalities and to better integrate health and social care. To deliver this approach, greater importance was placed on the NHS becoming an 'anchor institution'.

The NHS Confederation (2023) characterised an anchor institution as follows:

> 'An anchor institution is one that, alongside its main function, plays a significant and recognised role in a locality by making a strategic contribution to the local economy. Anchors' tend to be large, rooted in the place and have a strong social ethos. They traditionally include councils, universities, colleges, voluntary and

community sector organisations, sports clubs and, of course, the NHS.'[3]

Many private sector organisations and businesses now also see themselves as anchors and have expressed an interest in developing strategies that can support the development of their place.

> **"The NHS Confederation states that NHS organisations are key as anchor organisations due to their size as they not only support the health of their local community but also deliver social and economic impacts on their local communities."**

For ICSs to embrace this approach, partnerships may be forged with industry, academia, charities and other organisations which have a greater impact on the health and wellbeing of local communities. These partnership opportunities may result in portfolio careers which enable pharmacy professionals to apply and develop their knowledge while continuing to build their unique toolkit in a variety of settings.

What are the benefits of portfolio careers for pharmacy professionals and patient care?

Developing and widening skill sets

A portfolio career enables pharmacists to develop a diverse range of skills beyond delivering essentials services such as dispensing medications. From delivering medication reviews through to independent prescribing, through to research design and healthcare management, each role within a portfolio offers unique opportunities for skill development and being seen as a key part of the multidisciplinary team (MDT).

Engaging in portfolio careers, where individuals take on various roles and responsibilities across different sectors or organisations, can also enhance leadership skills. By navigating diverse professional environments, individuals gain a broad range of experiences and perspectives, enabling them to develop adaptability, strategic thinking, resilience and problem-solving abilities.

Each new role provides unique challenges and learning opportunities, fostering a deeper understanding of different leadership styles and management practices. This continuous exposure to varied situations and teams builds confidence and honest decision-making skills, ultimately shaping well-rounded and effective leaders capable of driving success in any context. This breadth of expertise not only enriches the pharmacist's professional profile, but also enhances their value to employers and patients alike.

Adaptability in an ever-changing healthcare landscape

Pharmacy is a dynamic field, constantly shaped by advancements in medicine, technology, changes in healthcare policies, and evolving patient needs. Embracing a portfolio career allows pharmacists to have up to date knowledge, develop agility and adaptability, enabling us to welcome and deliver new services at pace as seen with the case finding hypertension service and the COVID-19 vaccination programme, which was key in tackling the virus.

Promoting credibility within the workforce

Over the years, we have often discussed how pharmacy needs a 'seat at the table.' We have already seen how portfolio careers accelerate the development of knowledge and skills, and how these essential skills enable pharmacy professionals to be respected as credible healthcare professionals. Rather than pushing for a seat at the table, we will start to see pharmacy professionals being asked to be at the table, which is now visible across the profession of pharmacy.

Promoting creativity and innovation

Having multiple roles as part of adopting a portfolio academic and career pathway can encourage 'out of the box thinking', creativity and innovation. For example, pharmacists involved in academia can apply theory to frontline care (a key feature of our courses at Education for Health) and can also apply their clinical acumen to research or development. This 'cross-fertilisation' of ideas and experiences can generate new solutions that will deliver innovative benefits for patients and the NHS.

Increase individual engagement, wellbeing and job satisfaction

A portfolio career allows pharmacists to pursue their own passions and interests, leading to greater workplace engagement and job satisfaction, which is essential not only for the individual, but also for employers and patients.

Having multiple roles can also support a work/life balance. For example, at Education for Health, our pharmacist tutors and facilitators work in the NHS as well as delivering our courses. This approach helps to reduce stress and provides a sense of purpose and fulfilment in the knowledge that they are passing their experience onto the next generation of healthcare professionals. This ultimately contributes to improved staff satisfaction and retention, a crucial element of the long-term workforce strategy.[4]

Building resilience and security

In a period where there have been significant numbers of pharmacy closures it has proven necessary for pharmacists to consider other available career options. In an uncertain economic environment, the diversification of income streams inherent in a portfolio career may provide pharmacists with greater opportunities for financial security. Additionally, the varied nature of a portfolio career reduces the risk of job loss due to automation or outsourcing, enhancing professional resilience in a fluctuating job market.

The potential drawbacks of portfolio careers

As with any career approach, despite the identifiable advantages a portfolio career can bring there can also be drawbacks. Factors such as a lack of permanent job stability, inconsistent income, and a lack of the benefits and incentives that are a part of permanent employment can create challenges, especially during times of wider economic uncertainty. Movement to different roles over a short period of time can also become draining, for example adapting to new teams, leadership styles, and working environments.

From the employer perspective, the nature of portfolio careers may also present challenges. For example, frequently changing team members can

adversely affect efficiency and morale, and therefore service delivery and patient care. It may also become problematic recruiting individuals where deep specialisation and experience is required.

How will the future affect portfolio careers?

As the NHS continues to operate under significant pressure, driving innovation and being creative will be key to resolving some of the current and future challenges of the healthcare landscape.

Despite some of the stated drawbacks of a portfolio career pathway, it is hard to envisage a future where portfolio careers do not play a significant role in the healthcare workforce. However, if the portfolio approach is to be successfully embraced, then individuals must be committed to identifying development opportunities and understanding how education and training can support them to build and continually develop their toolkit.

Take home messages:

- Grab' each opportunity – even if you have to juggle several commitments at once.
- Continue to develop your individual toolkit. Remember, learning never stops! The knowledge and skills you are currently developing will help you secure future roles and opportunities.
- Networking will enable you to meet pharmacy and other healthcare professionals from different arenas which will help you to learn through other people's experiences, as well as identifying new opportunities.
- Develop your time and change management skills – this is essential if you want to fulfil different roles in a constant changing environment.

Summary

As the healthcare landscape continues to evolve, portfolio careers are becoming not just an individual career choice, but a viable solution to some of the challenges of the healthcare environment.

We have seen that portfolio careers can offer several advantages – from developing the skills of adaptability and resilience, as well as providing a sense of purpose and fulfilment. With ongoing challenges in the field of pharmacy and the wider healthcare landscape, pharmacists adopting a portfolio approach can look to combine roles from community pharmacy through to general practice, primary and secondary care, and industry, which will ultimately deliver for the patients we serve.

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Noticing and challenging race microaggressions

Farzana Mohammed,
Clinical Case Manager, Professional Support and Wellbeing Service (PSW) March 23-March 24, NHS England Workforce Training and Education, East of England.

Herefordshire & Worcestershire ICS Pharmacy Faculty Workforce Lead.

Email: Farzana.mohammed1@nhs.net
Twitter: @Farzanamohamm20

About the author

Farzana has a portfolio career with experience of working in a variety of clinical and management roles in primary, secondary and urgent care across Wales, in addition to developing the skills of the pharmacy workforce with Health Education Improvement Wales (HEIW). She collaborated with Informing Healthcare to deliver the Individual Health Record (IHR) project to improve access to GP records in Wales.

"Farzana completed a Clinical Fellowship with Health Education England South on Equality Diversity and Inclusion (EDI) in pharmacy programmes: exploring the lived experience of Black and minority ethnic trainee pharmacists during the foundation training year."

She worked as a Clinical Case Manager in the Professional Support and Wellbeing service (PSW) in the East of England March 23-March 24 where she promoted access to the service for trainee pharmacists, provided wellbeing support during the foundation training year and facilitated microaggressions workshops for trainees and educators accessing PSW services.

She is now working as the Herefordshire and Worcestershire ICS Pharmacy Faculty Workforce Lead and has created a pharmacy workforce strategy due for implementation 2024-2029 and is chair of the Midlands ICS workforce leads community of practice. Independent prescribing competency is maintained by working in urgent primary care in Aneurin Bevan University Health Board, and she provides EDI training to foundation trainees as part of the HEIW foundation training programme.

Farzana is Pharmacy Lead for Muslim Doctors Cymru (MDC), a volunteer group working to tackle health inequalities in ethnic minority communities in Wales where she led on successful projects to increase diversity on the stem cell register, diversity in clinical trials and was nominated with team MDC for a St David's award 2024. She is passionate about advocating for ethnic minority communities to ensure their voice and opinions are heard and gave evidence at the Senedd inquiry on progress with the 'Antiracist Wales Action Plan'.

Role of The Professional Support and Wellbeing Service

The Professional Support and Wellbeing Service (PSW) guides doctors, dentists and pharmacists in training through supportive interventions that make a positive difference to their training and wellbeing in the East of England. As a pharmacist clinical case manager, I offer confidential and non-judgmental personal wellbeing support to trainees during difficult times and signpost them to relevant support options including communication skills, coaching, psychological support or virtual workshops such as the microaggressions workshops provided for trainees and educators to explore the concept of race microaggressions, unconscious bias and stereotypes, and how they impact trainees in the workplace.

RPS race microaggressions toolkit

Racism's impact on healthcare

In an increasingly diverse and interconnected world, understanding the nuances of race and its impact on interactions within educational and training settings has become crucial. The diversity in the leadership of organisations may not reflect those likely to experience microaggressions and the ability to share experiences in a psychologically safe space without the need to justify or qualify microaggressions can be empowering.

Racism is widespread within the medical workforce according to the results of a British Medical Association (BMA) racism in medicine survey (BMA, 2022). Experiences of racism are affecting doctors' confidence and mental and physical wellbeing, and over three quarters (76%) of respondents experienced racism in their workplace on at least one occasion in the last two years. The report also found that 52% of Black doctors and 44% of Asian doctors reported feeling socially excluded at work, compared to just 5% of White British doctors. Experiences of racism are significantly under-reported for fear of backlash, and as a result the true extent of racism is neither exposed nor tackled, and worse, doctors suffer in silence, perpetuating further deterioration in their wellbeing.

Race microaggressions are subtle, often unintentional, acts of discrimination or bias that target individuals based on their racial background. If they are not recognised, they may go unnoticed or be dismissed as oversensitivity (Royal Pharmaceutical Society, 2021). These microaggressions can occur within training programs and educational institutions, contributing to a hostile and unwelcoming environment (BMA, 2020). It is vital that there is racial literacy which includes knowledge, skills, and the awareness needed to identify, understand and address issues related to race and racism amongst all staff.

The introduction of race microaggressions training workshops has gained traction, offering significant benefits to both educators and trainees. It involves recognising the ways in which race and racism impact individuals and society, developing the ability to engage in informed and constructive conversations about race, and fostering the capability to challenge and dismantle racial injustices. Anyone can be an ally, but those with lived experience are more likely to be invested in driving cultural change within organisations.

Historical Context - Understanding Race Microaggressions

Microaggressions are the commonplace daily verbal, behavioural, environmental indignities (slights, snubs or insults), whether intentional or unintentional, that communicate hostile, derogatory or negative messages to the target person or group. (Sue et al., 2007)

Derald Sue and colleagues categorised three different subtypes of microaggressions (Sue et al., 2007):

- **Micro assaults** are the most overt type of microaggressions. Most often they are done intentionally and the person doing them knows that they are harmful and derogatory. Examples include racial slurs, racist jokes, or comments that marginalise individuals based on their racial or ethnic background.
- **Micro insults** are more subtle than micro assaults and these are usually comments with an underlying meaning or a backhanded compliment or an action that is unintentionally discriminatory. Examples include offensive comments or actions that belittle or demean a person's identity.
- **Micro invalidations** involve telling a marginalised group that their experiences of prejudice don't matter or that they are being over-reactive or too sensitive about the things that are being said.

The power of racial microaggressions lies in their invisibility to the perpetrator and, oftentimes, the recipient. See Table 1.

The NHS England EDI improvement plan (NHS England, 2023) aims to improve equality, diversity and inclusion and to enhance the sense of belonging for NHS staff. This improvement plan sets out six targeted actions to address the prejudice and discrimination – direct and indirect – that exists through behaviour, policies, practices and cultures against certain groups and individuals across the NHS workforce. See Figure 1.

Race microaggressions are deeply ingrained in society, ofte manifest n perpetuated unknowingly. These covert acts of discrimination can in various forms, such as:
Micro assaults: an explicit racial derogation; verbal/non-verbal. This includes name-calling (ethnic slurs), avoidant behaviour, purposeful discriminatory actions, then saying "I was just joking."
Microinsults: Subtle, offensive comments or actions that belittle or demean a person's identity. E.g., "Your English is really good."
Microinvalidations: Dismissive remarks or behaviours that deny or trivialise an individual's experiences or feelings related to their race. E.g., "I'm sure they didn't mean anything by that."
Environmental Microaggressions: These occur when the physical environment or organisational culture excludes or targets certain racial or ethnic groups.

Table 1: Classification of Microaggressions

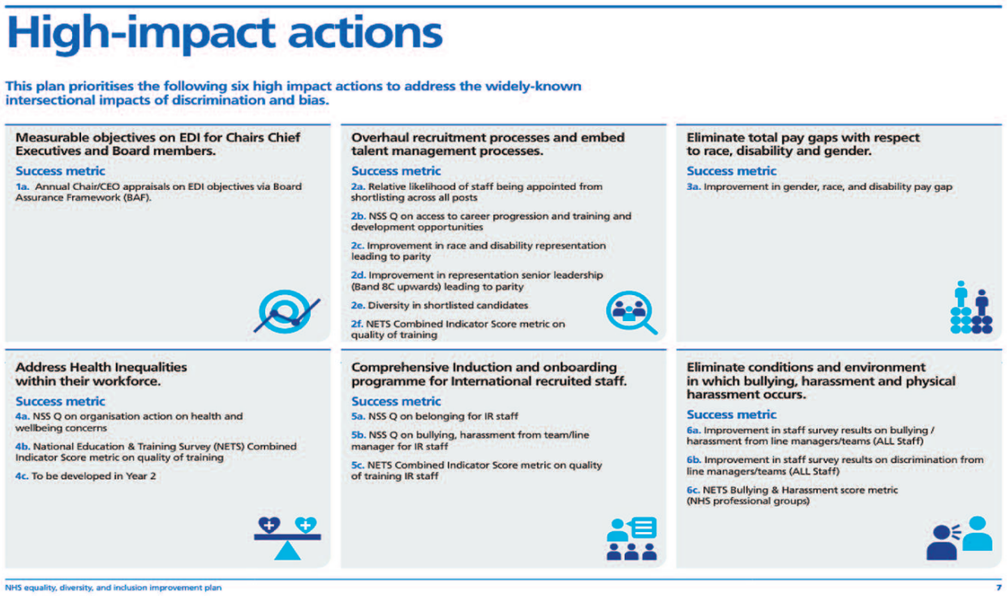

Figure 1: NHS England EDI improvement plan (NHS England, 2023) Six Actions

This initiative to introduce microaggressions training to educators and trainees by PSW both promotes workplace inclusion and aims to improve 'Action 6' of the EDI improvement plan. Action 6 is to "Create a workplace that ends bullying, discrimination, harassment, and physical violence at work" which is monitored through The National Education and Training Survey (NETS) (Health Education England, 2022).

The survey consists of a core set of questions focusing on trainee experience of induction, clinical supervision, teamwork, access to facilities and learning opportunities. Learners are asked about their health and wellbeing and whether they have experienced bullying, harassment or discrimination in the clinical learning environment. There is an option to recommend the training placement and the results from the survey will focus on opportunities to improve the quality of education and training and overall student experience.

Key Points: **National Education and Training Survey (NETS) East of England (2022):**

- 82% of healthcare staff indicated a satisfactory or above training experience
- 70% would recommend their training placement
- 79% said they had never been bullied on placements
- 72% had access to wellbeing resources
- 35% considered leaving their programme

> **"Pharmacy (87%) had the greatest percentage of learners that had not considered leaving their programme. The professional support and wellbeing service aim to support learners throughout the foundation training year with various provisions including careers advice, exam support and wellbeing support."**

A clinical case manager (Royal Pharmaceutical Society, 2023) with experience in EDI and a special interest in race microaggressions, created and delivered workshops providing an overview of microaggressions with activities to explore previous knowledge and personal experiences. See Table 2.

Aspect	Details
Provide Overview of	• Microaggressions and raise awareness. • Share common examples from literature. • Initiate discussions on social justice by using the lived experiences and perspectives of the participants.
Encourage Participants to Explore	• Race microaggressions, unconscious bias, stereotypes, intersectionality.
Understand Impact on Trainees	• How microaggressions, bias, and stereotypes affect workplace experiences.
Increase Awareness of	• Strategies to manage and reduce microaggressions (allyship, active bystander).
Facilitate Reflection and Discussion	• Breakout rooms with vignettes on topics like "Where are you really from?" and name mispronunciation.
Provide Protected Time for Conversations	• Dedicated time during breakout sessions.
Share Feedback	• Anonymised feedback from breakout groups shared with the main group.
Prioritise Psychological Safety	• Establish clear rules of engagement to ensure safety for trainees and educators
Gather Workshop Evaluation	• Provide link to feedback form at the end

Table 2: Summary of virtual workshop (2 hours)

The events were attended by doctors in training and their educators (September and October 2023). There was a 70% response rate to the feedback survey after the event and 90% of respondents rated the effectiveness of workshop as 8/10 or above.

Reflection themes from discussions in breakout rooms

Breakout room groups were able to record discussion points anonymously on an IdeaBoardz template. The anonymised notes on the board in Figure 2 (below) provide valuable insight into the lived experience of participants.

Key Points:

- Microaggressions can have a profound impact on the mental health of those targeted and psychological safety when having these difficult conversations is a priority.
- "Where are you from?" is a way to find out more about your heritage, but the context behind the question and the way it is asked determines if the individual is inquisitive or being discriminatory.
- Name microaggressions can present as names being mispronounced, misspelled, misunderstood, or shortened. A common occurrence is for some people choosing to use a more "English-friendly" variation of their name if it's not easy to say, spell or remember. Our participants talked about why name microaggressions are so hurtful, the importance of making an effort to pronounce names correctly, to correct mispronunciation immediately and not to shorten a name without permission.

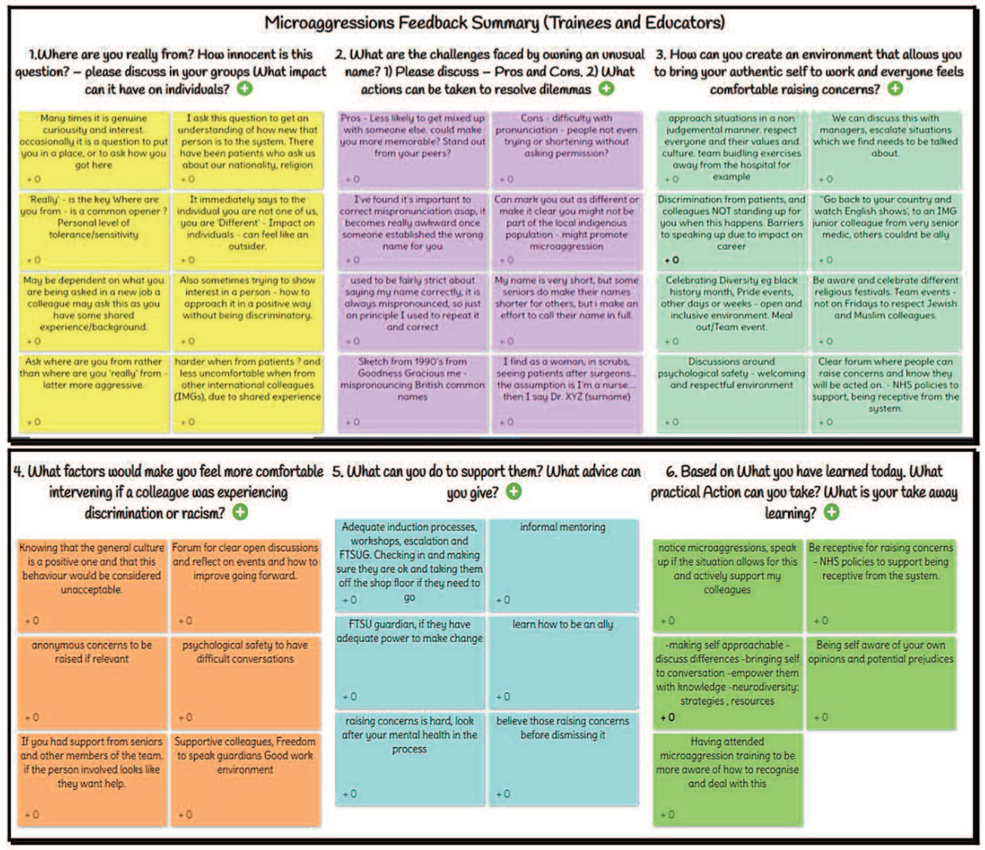

Figure 2. Breakout room discussion

- Celebrating diversity within teams promotes inclusion and creates a sense of belonging with respect for everyone and their cultural beliefs.
- Raising concerns is a challenge which can be facilitated by having support of senior staff, robust organisational policies, access to freedom to speak up guardians or the ability to anonymously report incidents that require escalation and resolution.
- The importance of supporting colleagues, especially if the discrimination is from patients, but it is recognised this can happen from senior colleagues within the workplace creating barriers to speaking up if the consequences negatively impact on future career prospects.
- The value and role of an ally who supports and amplifies the voice of those who are underrepresented and uses their comparative privilege to do so. An ally understands and calls out inappropriate actions and language, leading by example and not being silent when there is injustice.
- To understand the barriers to progression for people from underrepresented groups.
- Recognising and addressing our own biases as educators in addition to recognising and understanding these subtle forms of discrimination and their impact on trainees. When educators can identify such behaviours, they can take steps to address them effectively, creating a more inclusive learning environment.

Learning from events

Trainees and educators were given an opportunity to share stories of lived experience in the workplace and Table 3 captures positive feedback from the survey.

Benefits of microaggressions training for trainees include more empowerment and advocacy, building allyship in the workplace and peer support for mental health and wellbeing. Trainees become more aware of race microaggressions and how to respond to them and training helps them develop strategies to cope with and mitigate the negative effects of these experiences. Benefits of microaggressions training for educators includes more awareness and recognition of discrimination, enhanced cultural competence and improved mentorship. When educators can identify such behaviours, they can take steps to address them effectively, creating a more inclusive learning environment.

Future work

Participants were keen to continue conversations and suggested widening the scope of the workshop for future iterations to include:

1. More understanding of the legal framework that supports staff in the workplace and available avenues of help.
2. Further discussions regarding effective solutions to aid speaking up, e.g., Freedom to Speak Up Guardians, when local support mechanisms are ineffective.
3. Challenging microaggressions in the workplace: More examples of how to identify or differentiate subtle microaggressions and more examples of micro-affirmations.
4. Addition of roleplay scenarios or simulation with an opportunity to practice how to intervene or be an active bystander.

Conclusion

Understanding and addressing race microaggressions in training programs is essential for creating inclusive, respectful, and equitable educational environments. It is not easy to speak up, responding to microaggressions in a way that both highlights the behaviour and impact, while moving the conversation forward takes practice (James-Edwards D, 2023).

Trainee voice: Comments from participants who attended the workshop
• This course should be aimed at educational and clinical supervisors and college tutors for organisational change - being part of juniors having awareness is useful however having to deal with senior management in hierarchy is very difficult unless there is active educational process to make them understand how junior team members feel and respond.
• Involve seniors in the workshops, as they will likely be the policy stakeholder to be involved.
• This is an area that all staff should have, including senior manager. Should be made mandatory for everyone working in the NHS.
• Identify channels on how to seek help without being singled out.
Educator voice: Comments from participants who attended the workshop
• The impact or perception of microaggression felt by what appears to be 'common' comments - important to validate someone's experience, asked how they wish to proceed (action vs inaction).
• Whilst this session empowers individuals to report incidents, perhaps there needs to be work done on why one incident can affect one individual more than others.
• Engaging during session – inclusive.
• Useful strategies to recognise and how to approach microaggression in a non-confrontational way.

Table 3. Workshop Feedback

REBECA MOYA/THE VARSITY

Raising awareness by starting the conversation on this topic using simple questions in the breakout rooms really engaged the participants. The most impactful aspect of the workshop was the interactive group discussions, sharing examples with tips on how to recognise and deal with microaggressions in a practical way. The creation of a safe psychological space by PSW for trainees and educators to come together to have these discussions was also commended. Microaggressions training workshops conducted in a safe psychological space with opportunity for sharing lived experiences offer significant benefits to both educators and trainees.

A testimonial for the PSW Microaggressions workshop

"Excellent style, participative, good balance of discussion and material."

"Very useful sessions on a subject that affect us and our trainees on a daily base."

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Primary Care Network Pharmacists Priorities in a Changing NHS: Opportunities, Challenges and Solutions

Jennifer McCutcheon,
Lead Clinical Pharmacist – SEOxHA Primary Care Network (Donnington, The Leys and Temple Cowley)

About the author

In my current role I lead a team of pharmacists and a technician working across a network of three GP practices which are situated on the outskirts of Oxford City. Previously, I was seconded to a liaison role between PCNs and clinical commissioning group. Prior to the introduction of PCNs, I worked in a similar role leading a team of pharmacists that worked across nine practices in a GP federation.

"Before moving into general practice in 2015 I was a hospital pharmacist for eight years, working across many specialities, completing my master's degree in clinical pharmacy and independent prescribing qualifications during this time."

Introduction

Primary care networks (PCNs) were set up in 2019 with the original aim of moving funding to encourage collaboration between small groups of GP practices, to develop in such a way as to deliver bespoke healthcare services to meet the needs of their patient populations. A significant part of the PCN contract is around the introduction of 'additional roles' staff, two of these are pharmacists and pharmacy technicians. The Additional Roles Reimbursement Scheme (ARRS) funding also provides scope for first contact physiotherapists, paramedics, dieticians and health and social wellbeing practitioners.

As we pass the end of the original five-year Network Contract Directed Enhanced Service (DES)[1] it is perhaps helpful to reflect on the current challenges for PCN Pharmacists. In this article we aim to consider the challenges, opportunities and solutions faced by PCN Pharmacists, bringing to light some priorities for our teams for moving forward outside of the first PCN DES.[1]

What are the challenges for PCN Pharmacy Teams?

One of the key ones for my team has been uncertainty about how staff from the DES ARRS will be funded from April 2024. The Fuller Stocktake Report[2] highlighted NHS England's intention to continue funding ARRS roles into 2024, and for them to be treated as part of the 'core PCN cost base' when any changes to the General Medical Services contracts occur in the same year. This gives pharmacy staff already in post the reassurance that their jobs are secure, but locally has made the PCN management team nervous about recruiting to vacant management or administrative supporting posts in the PCN that are funded outside of the ARRS roles.

Uncertainty around PCN funding has also emphasised the difficulty of striking the balance between making a difference at patient, practice and PCN level. In the PCN where I work, there are no practice employed pharmacists that were employed prior to the formation of PCNs, and so we constantly strive to support practices in completing medicines-related workload for their populations, such as prescription reviews at the transfer of care (triggered by discharge letters or

letters from outpatient clinics), medication queries, medication reviews, elements of the Quality Outcomes Framework (QOF) and local Prescribing Quality Scheme (PQS) alongside workload from the PCN DES. This includes structured medication reviews (SMRs), cardiovascular disease prevention and input into the care home multidisciplinary team, amongst other elements. The change to the Investment and Impact Fund (IIF – financial scheme like QOF that incentivises elements of the contract), this year in which SMR targets no longer appeared has also meant that many PCNs have deprioritised them.

The value and capability of pharmacy teams mean that the potential workload has grown significantly over the course of the DES contract. This recognition of our skills has been fantastic for pharmacists and pharmacy technicians; however, with the funding in the DES contract being limited, this means that pressure can no longer be relieved by adding more ARRS staff to the pool. Instead, we are either having to work harder, smarter, and in some cases limit what we do so that we can maintain quality in areas we are working on, or having to work up business cases to secure funding from other sources.

The Fuller Stocktake Report[2] highlighted the importance of clear pathways for career progression for ARRS funded roles in retaining staff. This will be a key challenge over the coming year as we see many of the pharmacists who entered PCN roles in the first two years of the contract complete their training pathways, settle in as prescribers and then begin to ask, "What is next for me?". The challenge being that there is not yet a clear direction of travel at this stage, but options include: staying as an expert generalist but specialising depending on local need, completing Advanced Clinical Practitioner (ACP) courses, or credentialling with the Royal Pharmaceutical Society via a portfolio submission. Another option is to move into less clinical, more strategic roles such as taking up the 'Clinical Director' position in a PCN. Some of these options are not mutually exclusive.

Recruitment of pharmacist and technician workforce has always been a challenge in the PCN where I am based, and generally in the local area. Unfortunately, the distance from nearby pharmacy schools such as Aston, Keele, Bath or Bristol means that there is not a ready supply of local newly qualified pharmacists. Additionally, the cost of living in the area means that it is less likely that staff would move to work, especially with ARRS funding being the same nationally bar London.

To fill recruitment gaps and ensure that ARRS funding is used, many PCNs have resorted to working with subcontracting agencies that provide remote pharmacists working from other areas of the country who can see patients virtually but are not able to provide in person consultations. The benefits of doing this are that problems with consultation space are not an issue, and some of the pharmacy team workload is entirely suitable for telephone or virtual consultations which means the work can continue to be delegated away from GPs. The disadvantages are that there are many patients who require in-person consultations, and it does create a divide in the workforce; however, with careful management it is a better solution than vacancies in the team.

"Structured medication reviews (SMRs) have formed a major focus for pharmacist roles within PCNs (because of the DES) and as a result, the CPPE Primary Care Pharmacy Education Pathway for pharmacy professionals has focussed on this mainstay element. There have been a number of challenges associated with SMRs for pharmacists and their teams, including being allowed the time to complete them, engaging patients and the ability to demonstrate their value. This is not helped by the removal of the IIF incentives to complete them."

SMRs are a full, patient-centred, holistic review with the patient (and if appropriate their carer) of their medicines and medical conditions. These are more in-depth than standard medication reviews and usually target more complex patients such as care home residents, patients on high numbers of repeat medication and frail housebound patients. To complete an SMR fully, it is ideal that the patient is contacted beforehand to explain the purpose of the appointment, and any outstanding monitoring should be arranged. The pharmacist reviewing the patient will also need to review the notes and consider the case.

There has been tension in primary care about the amount of time required to complete such reviews, when general practice is under significant pressure and GPs and other clinicians are allowed so little time for their caseload. Part of this challenge has also been linked with the lack of published evidence demonstrating the benefits of SMRs. We eagerly await the outcomes of studies such as the Optimising StruCtured medicAtion Reviews (OSCAR) study to support this and in the meantime we are gathering case-based evidence to show their benefit to patients.

Nine years from the beginning of the first NHS England pilot scheme to introduce more pharmacists into general practice, one of the remaining challenges is the lack of understanding and knowledge of the role from practitioners in other sectors and patients. This has improved gradually, but remains a barrier in some circumstances. Examples of where this is an issue include hospital consultants writing back to ask the pharmacist to enquire with the GP about prescription issues before troubling them, when we are often contacting consultants on the GP's behalf, and patients presenting to the pharmacy next door when being asked to come to the practice for an appointment with the PCN or practice pharmacist. At other interfaces there can also be issues, for example ensuring that PCN and practice pharmacists are included in consideration of pathways, funding and guidance from integrated care boards.

From Challenges to Opportunities...

The current challenges we face as a pharmacy PCN workforce are significant, but this also creates many different opportunities.

Some ideas from my practice include:

Measure what you do

This sounds simple, but if you are not already using a clinical system template to ensure your work is coded in such a way that you can then search and gather data of what you are doing, then please consider implementing this. Search for and collate the information at monthly or quarterly intervals and use this to demonstrate what you do. Examples of what you could measure include: the number of consultations, face to face appointments, telephone calls, discharge medication reviews, medications reviews, care home reviews, long-term condition reviews and structured medication reviews.

Keep records of any local incentive scheme targets or audits you have helped achieve, QOF domains that you have input into directly, and feedback from patients. Presenting this to both your practice and PCN management teams on a regular basis gives them a tangible idea of what you are doing, stops your workload being 'unseen' and means that if funding structures change, you are empowered with data to demonstrate the measurable value that pharmacy teams add to the PCN and general practice workforce.

Look for gaps in your practice team's skills and see if you can adapt to fill them

With the right training, pharmacists can take on many different roles in the PCN, and practice workforce. If you are approaching the end of your training pathway and wondering what is next, look out for gaps where there are shortfalls in the practice's QOF until a GP steps in at the end of the year. Could you train more in an area such as heart failure, to provide the heart failure reviews for your practices? Or is there a need for someone that is an expert in lipid management? Or depression? Look in more depth at the PCN DES contract and see if there are areas that you could provide more support to. For example, are there links that you have with community pharmacy that could mean that the cardiovascular disease elements could be more easily achieved by making better use of services locally outside of the PCN. Find out more about what funding might be available if you wish to train further yourself (including advanced practice modules). Training hubs are usually able to advise on this.

For pharmacists embarking on an independent prescribing course, look to specialise and focus on therapy areas with the highest demand and interest such as depression or anxiety, menopause and HRT. Traditionally many trainee independent prescribers have kept to areas of physical chronic disease which are often also areas of focus for practice nurses, such as hypertension, diabetes and asthma. Think outside the box and beyond the IP course.

Consider the future of the PCN pharmacy workforce and succession planning

Most PCNs now have a pharmacist who has completed the training pathway and independent prescribing course; therefore, it is the ideal time to consider linking with pharmacy schools in universities to provide placements for undergraduate pharmacy students or working up a rotational or split foundation year with your local hospital or community pharmacy providers.

This is very important, as bringing pharmacy students into primary care in their training will give them the opportunity to see what kind of roles they could move into in the future, hopefully increasing the uptake of vacant posts. Similarly, this applies to pharmacy technician roles. You may also consider supporting someone to train as a pharmacy technician in partnership with another provider. Often ICB pharmacy workforce leads will be able to provide details of opportunities to get involved in these training schemes.

Think about how you link in with the medicine team at your Integrated Care Board (ICB)

Are you making the most of any support offered for optimising any prescribing scheme outcomes? Saving time by saying yes to their team offering to come in and help run searches or contact patients will ultimately mean you can achieve more in other areas. Also, are PCN and practice pharmacists represented at your local prescribing committees? Lots of the decisions made at them will impact your role, and often the committees will have GP representation, but they have not always been remodelled since the move to having more pharmacists in general practice.

The benefits of having representation at these committees includes helping to iron out logistical issues for new drugs (for example with monitoring requirements) before they are freely available on the formulary. The pharmacist involved will also gain an understanding of why certain products are on the formulary whereas others are not, which they can then feedback to the PCN pharmacy teams across the area, helping others understand the basis of decisions and also to disseminate new guidance. Having an awareness of what is on the horizon in terms of additions to the formulary helps with planning, for example if there is a likely upcoming large switch of product, or new drug that requires a different monitoring protocol.

Find out more about research and networking opportunities locally

This is one of the pillars of advanced practice and being involved in research will give you other skills and knowledge that can only support your development as a well-rounded practitioner. Some practices will already be involved in research, or you may be able to find out more from a local GP who has a special interest, by contacting a local university, or by linking in with the National Institute for Health and Care Research (NIHR).

"To move forward in publicising your role, if this continues to be an issue for you, consider checking the PCN and practice websites to see how your role is described. Ask for a slot explaining your role in newsletters that go to patients, if there is one, also if you aren't already known to the practice patient participation groups, consider attending their meetings."

For wider networking find out if you could potentially visit your local hospital pharmacy department, meet the team and maybe take some time to understand how each other's roles work, and the process for medication at discharge. Try to attend local education days in areas you specialise in, this is often a great way to help hospital consultants and specialist nurses understand our roles. Hopefully at this stage you are well known to your community pharmacy colleagues and PCN community link pharmacist, but gaining an update at this stage on the new services they are providing, and reflecting on systems such as how you collaborate on shortages will still be of benefit.

Think about how you want to work with (or without) input from industry colleagues in your role

If you are not already aware, find out PCN and practice policies on liaison with pharmaceutical representatives. Decide how you feel about such interactions as an independent autonomous practitioner and how this might impact or influence your role.

Sometimes there might be set circumstances under which you might consider interactions, where there is funding for a project that would benefit patients but would otherwise not be able to happen and is not attached to certain outcomes from the company, for example. Be sure to balance company information with data and information on other choices from your local formulary.

Conclusion

There are many ways we can continue to evolve the pharmacist role within PCNs, accepting that our priorities will be different depending on the current strengths and weaknesses of services provided. At this stage, it is important to reflect on how far pharmacists within PCNs have come and to consider how to move forward in a way that benefits the individual, patients, and the network, ensuring that we continue to evolve and develop our roles within an ever-changing healthcare system.

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Pharmacy in Scotland – Taking clinical care closer to those with Inflammatory Bowel Disease

Michael Smith MPharm MRPharmS MSc IP,
Highly Specialist Clinical Pharmacist & Pharmacy Team Lead Gastroenterology.

LinkedIn: https://www.linkedin.com/in/michael-smith-5474741a1/

X: @mspharm

About the author

Michael leads a gastroenterology (IBD) pharmacy team across secondary care services in Lanarkshire. The team includes two other specialist pharmacists, a clinical secretary and a clerical officer.

The pharmacy team is now embedded into the IBD multidisciplinary team across three acute hospitals in line with strategic pharmacy, NHS and IBD policies. It leads on the prescribing and monitoring of advanced therapy medicines, alongside delivering outpatient IBD pharmacist led clinics, utilising advanced clinical assessment and decision-making skills in line with the Royal Pharmaceutical Society's 4 pillars of Advanced Practice.

Michael also leads on the medicines governance elements of the service, working to ensure safe, effective and person-centred use of IBD medicines across the health board. He was the inaugural Chair of the Scottish Gastroenterology Pharmacist Network (SGPN) from 2022-2024, is the National IBD AHP, Nurse & Pharmacy Representative on the Scottish Society of Gastroenterology Council and sits on the National Centre for Sustainable Delivery IBD steering group.

What is Inflammatory Bowel Disease?

Inflammatory Bowel Disease (IBD), which includes the two long-term conditions Ulcerative Colitis (UC) and Crohn's Disease (CD), has no known cure and causes significant morbidity. Symptoms include chronic bloody diarrhoea, abdominal pain, faecal urgency, anaemia, weight loss, extreme fatigue, anxiety, depression and extraintestinal manifestations.[1] IBD can also cause further complications such as chronic perianal infection, strictures, fistulas and malignancies.[2]

The precise cause of IBD remains unknown, however genetic susceptibility, the intestinal microbiome, environmental factors and immunological dysregulation have all been implicated in the pathogenesis of IBD.[3] Cases of IBD have been on the rise across the world, with a higher than expected incidence and prevalence across the United Kingdom which is leading to increased financial pressures on health services and disease burden for those living with IBD.[4,5] There are currently over half a million people in the UK living with IBD, with prevalence at its highest in Scotland (0.97%).[6]

The last national UK IBD audit in 2015 estimated the cost of IBD to the NHS to be more than £1 billion.[7] Although there is no recent audit data, Crohn's and Colitis UK (CCUK) estimate that the annual cost of treating a flare of IBD is up to six times greater than treating a patient in remission.[8]

IBD Management

Corticosteroid therapy has been the cornerstone of the initial management of acute IBD for many years, particularly when the disease is severe. While corticosteroids still have a place in today's treatment, they are generally a temporary measure that can be deployed until effective maintenance therapy is initiated. Other therapies that can be used include 5-Aminosalicylates (e.g. Mesalazine), thiopurines (e.g. azathioprine) and immunosuppressants (e.g. methotrexate).

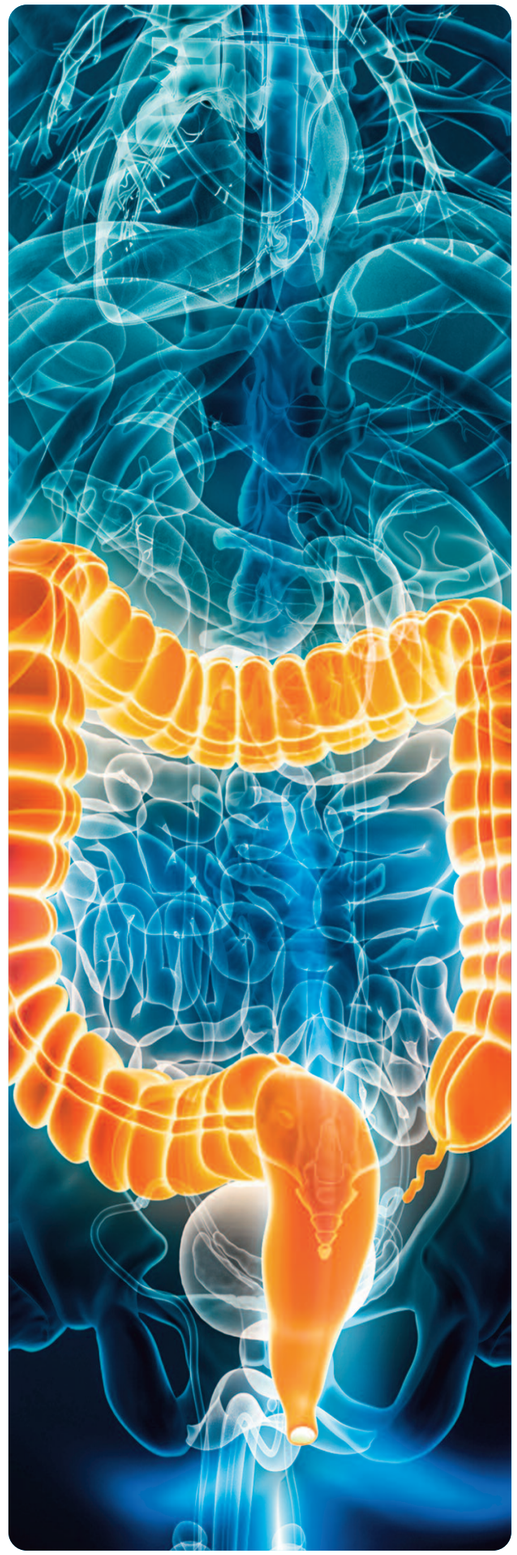
In recent years there has been a shift to using more advanced therapies earlier in the course of disease treatment as they have demonstrated improved patient outcomes.[9] These advanced treatment options include monoclonal antibody biologics (MABs) (e.g. adalimumab), Janus kinase (JAK) inhibitors (e.g. upadacitinib) and sphingosine-1 phosphate (SP1) receptor modulators (e.g. ozanimod). Previously, most advanced therapies – MABs in particular (e.g. infliximab) – were delivered intravenously, however there are now various subcutaneous and oral preparations available, enabling patients to have the option to receive these treatments at home. Generally, these medicines are classed as high-cost medicines and as such, appropriate clinical and financial governance needs to be in place with prescribing responsibilities remaining within the specialist services.

Pharmacy Services as part of an IBD MDT

The increasing complexity and costs associated with these advanced therapies has increased the likelihood of IBD services having specialist pharmacists working as part of the IBD MDT. This has been recognised in the IBD UK national standards. IBD UK is a collective organisation of royal colleges and professional bodies, who ensure IBD services across the UK are delivering the best quality of care possible. Their standards for IBD services recommend that an IBD team should employ a 0.6 whole time equivalent (WTE) expert pharmacist in IBD for a typical district general population of 250,000 people. They recognise that pharmacists can bring a unique set of skills and value to an IBD team as medicines experts.

Development of a novel IBD pharmacy service across Lanarkshire

Lanarkshire has a population size of 650,000 people, which consists of a mixture of urban and rural communities across West Central Scotland. Before 2021, the IBD team in Lanarkshire did not have any dedicated pharmacy team support. It was clear there was a need for an established pharmacy team to become integrated into the IBD MDT to support the use of advanced therapies, to provide expertise in medicines governance and be able to identify the key areas where financial savings could be delivered. There was also a recognition that pharmacists would be able to deliver novel advanced clinical roles. The team was established in the wake of the increasing backlog of outpatient care that had been created by the COVID-19 pandemic and as such it was important that the



team could help deliver an increase the service capacity for the IBD MDT in line with the IBD UK standards. As such, this has allowed us to also deliver on the objectives of some key national Scottish Government policy including 'Achieving Excellence in Pharmaceutical Care' and the 'NHS Recovery Plan 2021-2026'.

Spend to save: an investment in the IBD team

The team was established on a spend to save initiative, with a primary focus on delivering a programme of switching patients from intravenous (IV) to subcutaneous (SC) biologics to deliver financial savings to the health board and ensure future cost avoidance measures.

"The pharmacy team established a pathway for the switch process to ensure appropriate underpinning governance was in place. This element of the service was entirely IBD pharmacist led, with approximately 160 patients being switched from IV to SC therapy. As part of this process, suitable patients were identified and assessed ahead of bringing them into pharmacist led clinics with the help of our administrative colleagues. We developed patient education materials and standardised switch packs allowing patients to understand why this process was taking place."

Our first clinics were set up with patients being able to attend virtually by video consultation using the NHS Near Me 'attend anywhere' software, or they were able to attend for a face-to-face consultation. At the clinic, we completed IBD disease assessments to ascertain if the patient's condition was controlled or not. Although the key objective of this programme was to deliver IV to SC switches, it also allowed us to identify those patients with uncontrolled IBD. We were then able to independently discuss these patients at our weekly IBD MDT meetings to ensure the wider team had sight of these issues.

In most cases we were then able to bring these patients back to clinic for a therapy switch and ongoing review of disease control. During the switch programme, patients were given the opportunity to discuss any concerns or questions they had about the switch and were given the choice around their willingness to switch. Our team successfully delivered the savings required and implemented an ongoing programme of cost avoidance.

It was in this initial programme of switches that we as a team upskilled ourselves in the management of IBD and learned how to effectively run pharmacist led clinics. This was a novel development in the board and at many times it felt like we were 'building the plane whilst flying it at the same time'. It was this continuous learning and reflection that allowed the pharmacy team to home in on what value we could add for patients with IBD and for the wider MDT.

The next steps after the switch programme

In 2021, there were approximately 600 patients on advanced therapies. Now, in 2024, this has almost doubled with just over 1200 patients across the board currently on advanced therapies as we move towards more people being diagnosed with IBD. As such, the pharmacy team is now effectively co-ordinating the prescribing, management and monitoring of all these advanced therapies in collaboration with the IBD MDT, including our specialist IBD nurse and consultant gastroenterologist colleagues.

This transformation work has re-configured key elements of the IBD service in Lanarkshire. Ultimately, our team has been able to increase and release capacity across the IBD service directly and indirectly. Previously, the majority of the advanced therapy management was led by

our IBD nurse colleagues, however with re-configuration of responsibilities, this has meant the IBD nurse team have been able to increase their own clinical capacity as well as managing any patients who need urgent advice and management via the IBD helpline.

It is important to mention how administrative-heavy some of these elements of the service are and as such our clinical secretary and clerical officer are now key members of the pharmacy team and the wider IBD team. They are the front face of our pharmacy team, interacting with our patients on a daily basis, from managing our clinic and medicines prescribing admin to taking medicines related queries that they triage onto us accordingly. This has allowed the pharmacy team to develop and deliver their clinical roles effectively in line with advanced practice.

Outpatient IBD pharmacist led clinics

Having successfully delivered on the programme of IV to SC switches, this allowed us to take the next step into delivering a sustainable service for the future. In order to do this, we had to spend a lot of time in 'listening mode' and learning from our colleagues in the IBD MDT. We spent many hours shadowing our IBD nurse specialist and consultant colleagues to get a good grasp on how to assess patients safely. In addition, some members of the pharmacy team completed diploma and master stage modules on Advanced Clinical skills via Robert Gordon University and Glasgow Caledonian University to develop the key skills required to clinically assess patients safely. This was important in providing assurance to our patients and to the MDT, showing that we could conduct our clinics safely and independently.

With ongoing learning, reflection and development, the team now has an ongoing clinical case load of IBD patients which they autonomously manage as part of the MDT. The team conduct weekly IBD pharmacist-led clinics, which includes:

- Disease assessment
- Physical examination
- Phlebotomy
- TDM assessment
- Medicine education and consent
- Medicine initiation and prescribing
- Managing medicine non-compliance

- Stopping medicines that are no longer indicated
- Optimisation of therapy through dose titrations
- Requesting and review of diagnostic tests and monitoring (e.g. faecal calprotectin and blood tests)
- Initiation of supportive therapies (e.g. iron, vitamin b12, folic acid, steroids)
- IBD flare up management
- Lifestyle advice
- Family planning discussions
- Pregnancy and breastfeeding discussions
- Referrals to MDT
- Action of MDT outcome
- Referrals to other specialities

"In some cases, where patients have an acute flare of IBD, we would admit them to hospital for management. As such, we have developed expert knowledge of professional standards, policy, legislation and good practice guidance in relation to the management of patients with IBD. The team are now regularly providing expert pharmaceutical input and advice on the management of IBD, often in complex and contentious situations."

The team now takes the lead on the post-induction review of those patients who are on advanced therapies across Lanarkshire for IBD, which usually takes place between 8-16 weeks after initiation of therapy. This is important for a number of reasons, including identifying early non-response to advanced therapies and to ensure they are optimised to reduce morbidity associated with active IBD. Some patients need to switch medicines rapidly, and in these cases our team has been able to manage this efficiently. If a therapy is deemed ineffective, the pharmacy team can help identify this in a timely manner, liaising with the MDT to change to an alternative.

Novel pharmacist led clinic pathways

In the last 18 months, we have trialled having a pharmacist on one of the acute hospital sites conducting the review of patients with newly diagnosed IBD. The aim of this pilot was to reduce the waiting times for these patients to been seen by gastroenterology and to initiate treatment in line with the Scottish Treatment Time Guarantee of 12 weeks.

The IBD team had set an ambitious target of seeing the majority of these patients within four weeks through a combination of IBD nurse and pharmacist led reviews. We have two 'new patient' slots per week where the pharmacist will see patients at clinic who have been referred to gastroenterology with newly diagnosed IBD. At these consultations, the pharmacist takes a detailed medical history and makes an initial clinical assessment of the patient's new IBD. They will initiate early treatment where required, such as an oral 5-ASA therapy for mild to moderate ulcerative colitis or the use of corticosteroids in severe cases where patients are in immediate need of symptomatic relief.

The pharmacist will then discuss these patients at the weekly IBD MDT, allowing consultant colleagues to decide if the patient needs to be seen at a consultant clinic on an urgent basis. In some cases, an MDT decision will be made to start advanced therapies, which the pharmacist is then able to co-ordinate. This has led to a reduction in waiting times for those patients with new IBD and has allowed us to start therapy earlier than we did before.

Management of Prescribing of Advanced Therapies

The team is now responsible for the co-ordination of prescribing and monitoring of all patients on advanced therapies for IBD. On a weekly basis, the team will prescribe IV, SC and oral therapies that are to be delivered via our day units, homecare service and hospital pharmacy departments.

With the increasing number of patients, the team is now co-ordinating prescribing – either by prescribing themselves in the majority of cases or supporting the prescribing by consultant gastroenterologists – of between 60-80 advanced therapies a week. This includes all appropriate blood monitoring, therapeutic drug monitoring, assessment of disease activity and the ongoing assessment of clinical suitability for therapy in the context of other co-morbidities or acute illness.

Our team will make independent decisions on optimising therapy or in some cases suspending therapy in light of acute illness or abnormal blood results. We also work closely with our colleagues in the homecare and aseptic pharmacy teams to ensure these therapies reach our patients on time and efficiently. This work was previously co-ordinated by our IBD nurse and consultant colleagues, which took up a significant portion of their time.

How has the pharmacy team been received by the IBD team and patients?

The pharmacy team has been able to demonstrate their value, gaining professional trust from other members of IBD MDT, but most importantly those patients with IBD. The pharmacy team has now become essential to the day-to-day operation of the IBD service, ensuring medicines are prescribed and managed safely. We are providing increased capacity directly through our own outpatient clinics and have also released capacity across the MDT.

Our patients with IBD have also provided lots of informal positive feedback on the service they have received. At first, many patients were not sure why they were seeing a pharmacist, but with the team being well established we have been able to demonstrate our value during every interaction. As medicines experts, we have become a source of knowledge for our patients, helping them to navigate and understand the complexities of the advanced therapies that are used in IBD.

In many cases we have built really effective therapeutic relationships with our patients, gaining their trust along the way. Not only have we been able to help patients understand their medicines, but we also have to reflect on the softer skills that we have had to develop. Over the course of being in our posts we have been able to upskill ourselves in managing the more difficult conversations that can come with managing IBD. We are seeing people with complex conditions that often have a significant impact on their lives and mental health. Helping people manage these difficult moments in their lives has been some of the most important work we have done.

The expansion and development of the Scottish Gastroenterology Pharmacist Network (SGPN)

When the pharmacy team became established in Lanarkshire, there was an appetite to learn from other services in Scotland that had developed similar roles. We did not want to 'reinvent the wheel' and if things were working well in other boards, we were keen to learn and adopt those practices.

Through linking with lead pharmacists for gastroenterology in other boards, it became apparent that there was a wider appetite to establish a formal network of pharmacists in gastroenterology in Scotland. This is when SGPN was born, and in early 2022 we had our first meeting, setting out what we wanted to achieve as a group. Our key aims have been to learn from each other, share best practice and foster a culture

of collaborative working for the benefit of gastroenterology services across Scotland.

In many cases, all of the pharmacists in the network regularly come up against similar issues in each of their respective boards. SGPN has become a forum where we can work on these issues together and develop solutions as a national group. We also regularly discuss the introduction of new advanced therapies and how these can be implemented within our respective board areas. As part of our strategic agenda, our aim has been to become the recognised expert pharmacy group for gastrointestinal disease across Scotland. As such, we have also been able to establish links with other key national boards and specialist interest groups such as NHS Education for Scotland, National Procurement, the National Acute Pharmacy Services group and the Scottish Rheumatology Pharmacists Network.

Moving forward, the network is also looking to develop and take the lead in developing advanced practice opportunities for pharmacists working in gastroenterology across Scotland, which will feed into the implementation of strategic policy in Scotland.

The future of IBD pharmacy services

It is clear that many IBD services across Scotland are recognising the value of pharmacists. Many of the boards have now been able to establish pharmacist support to IBD teams, however, many have yet to achieve the IBD UK standard of 0.6 WTE pharmacists per 250,000 populations. Achieving and exceeding this standard will be key as those patients with IBD will have increased co-morbidities and the advanced therapies will become more complex.

In Lanarkshire we have been able to show that pharmacists can deliver savings, implement pharmacist-led clinics and lead the prescribing and monitoring of advanced therapies. Most importantly this has allowed for increased capacity across the service, meaning patients with IBD are being seen by the right healthcare professional at the right time.

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A review of adherence to NICE criteria for initiation of treatment with romosozumab in severe osteoporosis

Wilcock M,[1] Roberson L,[1] Pothecary A[2]

[1] Pharmacy Department, [2] Rheumatology Department

Royal Cornwall Hospitals NHS Trust, Truro

Correspondence to: Mike.wilcock@nhs.net

Introduction

Romosozumab (Evenity) is a humanised monoclonal antibody recommended by NICE in May 2022 as an option for treating severe osteoporosis in post-menopausal patients who have experienced a major osteoporotic fracture (MOF) (spine, hip, forearm or humerus) within the past 24 months. Guidance from the National Osteoporosis Guideline Group (NOGG) prioritised its use in patients at high risk of further fractures. Romosozumab is a Payment by Results excluded drug commissioned by integrated care systems.

Objective

We aimed to identify whether romosozumab had been approved for use according to the criteria outlined in the NICE guidance within a teaching district general hospital in England. We also evaluated whether NOGG criteria also applied to these patients.

Method

Medical records were reviewed for a sample of patients approved via the Blueteq system to receive romosozumab during late 2022 and early 2023.

Results

Absence of risk factors of previous myocardial infarction or stroke was documented for 29 of the 30 patients. The need for calcium and vitamin D had been considered in all 30 patients. All 30 patients met one aspect of the NICE criteria having had a MOF. For 24 (80%) patients the date of the most recent MOF was within 24 months of the decision to commence romosozumab. Twenty-three (77%) also met the NOGG criteria.

Discussion

The mean age of our patients at 73 years is similar to that of the women in the major trials for romosozumab. In relation to having had a prior MOF this small-scale study found that all patients met this NICE starting requirement for romosozumab treatment. However, there was less certainty that the MOF had occurred within a 24-month period.

Conclusions

In this very small study, all the sample of 30 patients registered on Blueteq to receive romosozumab had documentation of eligibility in line with NICE criteria for suffering a MOF, though in 6 (20%) patients it was not evidently clear that the fracture had occurred within the required time period.

Background

Osteoporosis is a disease characterised by low bone mass, compromised bone strength, and structural deterioration of bone tissue, resulting in an increased risk of fracture. When osteoporosis-related fractures occur, patients experience pain, deformity, disability, loss of height, compromised health-related quality of life, and decreased life expectancy. Osteoporosis leads to nearly 9 million fractures annually worldwide, and over 300,000 patients present with fragility fractures to hospitals in the UK each year.[1]

Different classes of drugs are indicated for the prevention of osteoporosis-related fractures. These include inhibitors of bone resorption such as oral bisphosphonates, zoledronic acid (an intravenous bisphosphonate), denosumab, and agents that stimulate bone formation such as

teriparatide. Romosozumab (Evenity) is a humanised monoclonal antibody that inhibits sclerostin, thereby increasing bone formation and decreasing bone resorption. Its indication is severe osteoporosis in postmenopausal women at increased risk of fractures. It is available as a solution for subcutaneous injection in pre-filled syringes of 105 mg per syringe. The recommended dosage is 210 mg administered once every month and treatment duration is limited to 12 monthly doses. Patients on romosozumab should be adequately supplemented with calcium and vitamin D.

The efficacy of romosozumab for osteoporosis treatment is supported by two phase III studies (FRAME and ARCH) which enrolled postmenopausal women (55 to 90 years of age) with osteoporosis. In the FRAME study, a placebo-controlled randomised controlled trial (RCT), the mean age of the patients at baseline was 71 years and 41% of the patients had a historical fracture. The 10-year probability of a MOF in this patient population at baseline was 13%, reflecting a moderate-risk population.[2] In the ARCH study, an active-controlled RCT using alendronate, the mean age of the patients at baseline was 74 years and almost all patients had historical fracture. The 10-year probability of a MOF in this patient population at baseline was 20%, reflecting a high-risk population.[3]

The European Medicines Agency, when approving romosozumab,[4] noted an increased risk of cardiovascular serious adverse events in the clinical trial programme with an increase in adjudicated events of myocardial infarction, stroke and death observed in two of three pivotal studies: between romosozumab and alendronate in ARCH,[3] as well as in the smaller placebo-controlled male study.[5] Hence, romosozumab is contraindicated in patients with previous myocardial infarction or stroke.

Osteoporosis guidelines from different countries provide somewhat differing advice for the place of romosozumab. For instance, in Scotland it is recommend for the treatment of postmenopausal women who have experienced a fragility fracture and are at imminent risk of another fragility fracture (within 24 months).[6] American guidelines recommend romosozumab (with moderate

certainty evidence) or recombinant PTH teriparatide (with low-certainty evidence), followed by a bisphosphonate, to reduce the risk of fractures only in females with primary osteoporosis with very high risk of fracture.[7] In Canada it is an option for those who have had a recent (occurring within the past two years) severe vertebral fracture (vertebral body height loss of > 40%), or > one vertebral fracture, and a T-score ≤ −2.5.[8]

Across England and Wales, guidance from the National Institute for Health and Care Excellence (NICE) assesses the clinical and cost effectiveness of health technologies, including pharmaceuticals. The NHS is legally obliged to fund and resource medicines and treatments recommended by NICE's technology appraisals (TA). Furthermore, the NHS Constitution, which sets out rights to which patients, public and staff are entitled, and pledges which the NHS is committed to achieve, states that patients have the right to drugs and treatments that have been recommended by NICE for use in the NHS, if their doctor believes they are clinically appropriate.[9]

Within the NICE TA, romosozumab is recommended as an option for treating severe osteoporosis in people after menopause who are at high risk of fracture, only if they have had a MOF (spine, hip, forearm or humerus fracture) within 24 months (so are at imminent risk of another fracture) and the company provides romosozumab according to the commercial arrangement.[10]

"The National Osteoporosis Guideline Group prioritises romosozumab in postmenopausal women who have had a major osteoporotic fracture within 24 months, with any one of the following: a bone mineral density (BMD) T-Score ≤-3.5 (at the hip or spine), or a BMD T-score ≤-2.5 (at the hip or spine) and either vertebral fractures (either a vertebral fracture within 24 months or a history of ≥2 osteoporotic vertebral fractures), or very high fracture risk (e.g., as quantified by FRAX).[11]"

The NHS list price for romosozumab (two x 105mg) excluding VAT is £427.75, though a patient access scheme is in place as part of the NICE TA. A patient access scheme or commercial arrangement associated with the NICE guidance is a way for pharmaceutical companies to lower the acquisition cost to the NHS to improve its cost-effectiveness, so enabling patients to gain access to high-cost medicine treatments. High-cost medicines (that is, Payment by Results excluded drugs) are expensive prescribed items, representing a disproportionate cost relative to the total NHS cost of the relevant hospital episode in terms of volume and cost. Romosozumab is an Integrated Care System (ICS) commissioned high-cost medicine.

Royal Cornwall Hospitals NHS Trust is a 750-bed acute teaching district general hospital in the south-west of England. The hospital, in conjunction with the local ICS, utilises the Blueteq high-cost drug management system. Many ICSs in England use this Blueteq web-based system which allows clinicians to complete an online proforma for patients prescribed a high-cost medicine and receive automatic approval for funding if the patient meets all the relevant criteria which normally reflect the NICE TA guidance. This ensures that clinicians receive the approval to treat immediately. The Blueteq system retains, as an audit trail, the request history, including patient name, drug, indication, criteria for use, date of request, requesting clinician, and whether the request was granted or not. This enables commissioners to monitor the use of expensive treatment, so that only treatments prescribed in line with NICE guidelines are reimbursed to the hospital.

We aimed to identify whether romosozumab had been used according to the criteria based on the NICE TA.

Methods

This was a retrospective, single site study in an acute teaching district general hospital. An extract was downloaded in August 2023 from the Blueteq system for female patients granted approval to commence romosozumab treatment for severe osteoporosis. This download date was approximately eight months since the first patient was approved to receive romosozumab. Relevant data (patient demographics and treatment details) were imported into Excel by a member of the pharmacy team. Rheumatology correspondence (as part of the medical record) and any bone density scan or X-ray reports were examined for relevant information about past medical history and treatment.

Health Research Authority criteria about research and service evaluation were considered. This was a retrospective assessment involving no changes to the service delivered to patients, and we used the NHS Health research authority tool (http://www.hra-decisiontools.org.uk/research/index.html) which helped confirm that no ethical approval was required for this project. Patient data were used in accordance with local NHS hospital policy and this

assessment was recorded on the Trust's clinical effectiveness database.

Results

At the time of the Blueteq extract, there were 72 patients on the Blueteq system, and the records of the first 30 patients were reviewed. Mean age was 73 years (range 59 to 87).

Absence of risk factors of previous myocardial infarction or stroke was documented for 29 of the 30 patients and was missing for one patient. All 30 had correspondence for the GP and the patient describing the need for calcium and vitamin D supplementation. All 30 patients met one aspect of the NICE criteria having had a MOF. The site of the main fracture that was referred to in the correspondence was spine for 26 patients, forearm in two, and hip and humerus in one each. For 24 (80%) patients the date of the most recent MOF was within 24 months of the decision to commence romosozumab. However, any clear documentation as to the date of occurrence of a prior MOF was missing or ambivalent in six (20%) cases. Twenty-three (77%) of the 30 also met the NOGG criteria, with four patients not having a T score whilst the other three patients had a T score that was not sufficiently severe.

Table 1 shows the medication taken by the patients prior to commencing romosozumab; 18 patients had taken one prior therapy, three had tried two different types of medication, three had tried three and six patients had apparently not been on any the medication listed in the table.

Discussion

In relation to having had a prior MOF this small-scale study found that all 30 patients met this NICE starting requirement for romosozumab treatment. However, there was less certainty as regards the timing of that MOF, which should be within 24 months of commencing treatment. The NICE TA guidance contains an explanation from the clinical experts that the date of the previous fracture may not always be known, particularly for vertebral fractures, and hence it was recognised that the patient population targeted in the company's submission to NICE may be difficult to implement in clinical practice.[10] We observed that though there was no specific documented date for a fracture in six patients, the medical history did typically describe at-risk patients who reported a change in back pain for some months. These patients had not had a series of scans allowing the actual date of any recent fractures to be clearly identified and recorded. Interestingly, the two main trials (ARCH and FRAME) did not have strict eligibility criteria that all participants had to have had a fracture in the two years before enrolment.[2,3] In addition, we also noted that 23 (77%) of patients met the more explicit and restrictive NOGG criteria. There was one (3%) patient that did not have any documentation in the Rheumatology correspondence of absence of previous myocardial infarction or stroke.

The mean age of our patients at 73 years is similar to that of the women in the major trials (71 in FRAME[2] and 74 in ARCH[3]). However, 24 of the 30 patients may not have been eligible for the main phase 3 trials due to patients in those trials being excluded if they had a history of receiving named medication affecting bone metabolism within a certain time period prior to trial entry. This issue of previous treatments was noted by the CADTH which, from a clinical perspective, recommended across Canada that romosozumab be reimbursed for patients with a history of osteoporotic fracture and who are at high risk for future fracture, defined as a 10-year fracture risk $\geq$ 20% as defined by the FRAX tool, only if the patient is treatment naive to osteoporosis medications, except for calcium and/or vitamin D.[12] NICE did recognise that most people in ARCH[3] had not previously had treatment for osteoporosis, so there was uncertainty around the efficacy of romosozumab in later lines of therapy. However, in the NICE TA it is highlighted that in the STRUCTURE trial, romosozumab had a greater effect on BMD than teriparatide in people who had previously had bisphosphonates.[13] This gave some reassurance as to the efficacy of romosozumab regardless of previous treatment.

Bisphosphonate oral	21
Zoledronic acid	5
Denosumab	3
Strontium	2
Teriparatide	2

Table 1. Number of patients on prior medication

We recognise the limitations of a single centre, very small-scale retrospective study that sampled approximately 42% of the patients recorded on Blueteq as having been approved to start romosozumab. These results therefore cannot be generalised to other hospitals. There was inconsistent recording of prior HRT therapy in the notes, so we are unaware of the proportion that had been on this therapy. We do not report any prolonged follow up of patients in relation to any improvement in their osteoporosis.

Conclusion

In this very small study, all 30 patients registered on Blueteq to receive romosozumab had documentation of eligibility in line with NICE criteria for suffering a MOF. However, in 6 (20%) patients it was not evidently clear from the medical records that the MOF had occurred within the required 24 months. Twenty-three (77%) patients also met the prioritisation criteria from NOGG.

Declaration of interests

The authors have no interest to declare.

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Primary care pharmacy technicians support NHS sustainability: Reducing the environmental impact of inhaler prescribing

Saran Braybrook and **Rebecca Watkins,**
Forest of Dean Primary Care Network (PCN), Gloucestershire.
Email: Saran.braybrook@nhs.net

Presented as poster at UKCPA Conference 17 November 2023.

Context

The NHS aims to reduce its carbon footprint significantly by 2032. A major focus includes a shift to lower carbon inhalers via two themes. Salbutamol Metered Dose Inhalers (MDIs) are the single biggest source of carbon emissions from NHS prescribing and lower carbon options are available. Dry Powder Inhalers (DPIs) are less harmful to the environment than traditional MDIs but less commonly prescribed. The 2022/23 Primary Care Network (PCN) Investment and Impact Fund (IIF) includes sustainability targets to support change in the two following areas:

- Mean carbon emissions/salbutamol inhaler prescribed to encourage lower carbon products.
- Non-salbutamol MDI prescriptions to encourage more DPI prescribing and align with best practice in other European countries where DPIs are predominantly prescribed.

Problem

Practice staff including nurses and pharmacists have worked hard to review patients opportunistically to explore carbon saving options. However, it is a labour-intensive process and requires patient support and lengthy discussions, hence progress has been slow, as evidenced by the national data on the 2 targets above and anecdotal experience. Prior to the Covid pandemic, patient reviews were predominantly carried out face to face to ensure understanding and check inhaler technique. There is now a raft of new staff in primary care Additional Reimbursement Roles Scheme (ARRS) which includes pharmacy technicians, who are well placed to support the shift to lower carbon inhalers using a skill mix approach to better use resources.

Intervention

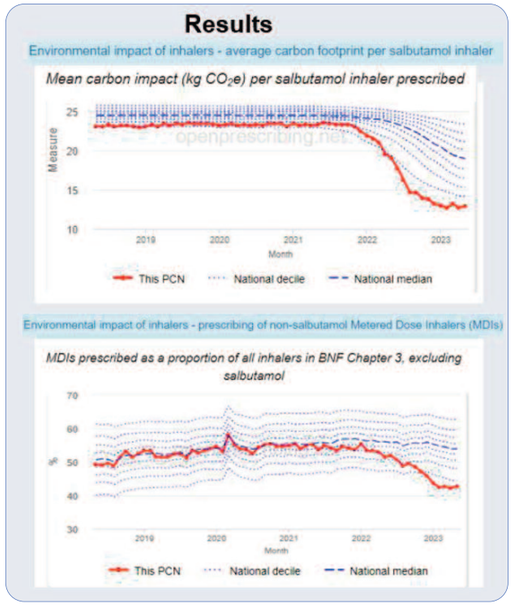
To accelerate progress toward targets, the PCN lead pharmacist ran local PCN practice-based pharmacy technician training to ensure their understanding was robust across wider clinical respiratory issues. This included discussion of wider clinical benefits for patients as well as environmental factors and focusing on answers to common patients' concerns. We also spent time trying out placebo newer inhalers to see how it might feel for patients. The team developed Standard Operating Procedures (SOPs) for technicians to systematically review specific patient groups using the remaining commonly used high carbon inhalers. Simple salbutamol SOPs were developed first, and this led to discussion in more complex areas such as inhaled corticosteroids, combination inhalers and targeting particularly high carbon inhalers which tended to be legacy prescribing. Technicians worked within practice teams including nurses and pharmacists to ensure a safe, consistent, and agreed practice approach, establishing who to refer patients to, when necessary. Where patients did not want to change, they were coded on clinical systems, "DPI not indicated", which helped achieve IIF targets and ensure patients were not rechallenged. Ensuring coding is up to date and correct is part of our technician medicines reviews and also helps to ensure patients are in the correct review groups and can be excluded from review where they have genuine concerns.

This approach was implemented after the Covid pandemic when patient contacts were routinely carried out via telephone, but with an ability to send information links by text or email, including inhaler technique videos. Locally the medicines team uses Accurx, which allows real time messages to patients, by text or email, including web links to directions on how to use a DPI or pictures and standard switch text to save time. This new technology replaced the need to send resource intensive letters via post to patients which might have been used in the past, further reducing carbon.

> "Often patients were offered the opportunity to trial a new device with the option to change or decline later. Use of the text system which allowed patients to reply back in 7 days by text without having to phone the surgery, was also sometimes useful, to give extra support if there were any issues. Patients that would not be suitable for changes were excluded; these included, care home patients, those with no mobile telephone numbers or were reviewed as unlikely to be good candidates for a digital approach, and those that had refused previous inhaler changes. Many patients were also picked up opportunistically during pharmacist led medicines reviews, face to face, or via telephone. Technicians often add suitable patients, like these, to pharmacist structured medicine review appointments."

Effects of changes

During the period Sep21-Mar23, PCN prescribing improved from 16th to 2nd percentile carbon impact salbutamol; 33rd to 4th percentile for reduction of non-salbutamol MDIs. All local PCNs reached lower carbon salbutamol targets. The PCN achieved 41% DPI use, the only one of 15 local PCNs to achieve part of the challenging national DPI target (35-44%).



Conclusions

Using a systematic PCN pharmacy technician review approach has speeded local progression to lower carbon inhalers using a skill mix approach. Pharmacy technicians, whilst not new in primary care, are often less common than pharmacists in PCNs, but they are a cost-effective resource supporting scarce pharmacist time. This task was well suited to pharmacy technicians' skills, allowing them to develop areas of expertise in respiratory medicines and also digital skills in practices, which are often underutilised. In our rural PCN, pharmacists continue to be difficult to recruit, conversely, we have managed to recruit a full complement of pharmacy technicians.

Carrying out reviews by telephone and sharing web-based resources via text with patients proved to be a viable option and many patients continue to choose this medium for medicines review over face to face.

Patient feedback for technician contacts to discuss medicines use has been very positive. Currently technicians have now moved on to wider respiratory good practice targets, such as including reviewing overuse of salbutamol by reviewing GP practice system set ups and establishing red flags with practice staff.

The medicines team are also developing other ways to streamline annual medicines reviews e.g. contraceptive pills, using technology to save time for patients and practice staff, and facilitate collection and recording of appropriate annual review information.

How technicians reviewed patients:

We sent an initial standardised Accurx text to appropriate patients to explain that we'd be contacting them shortly by phone to discuss the possibility of switching to a more environmentally friendly inhaler. An NHS information sheet about the drive to prescribe greener inhalers generally was attached. This allowed the patient time to consider the issue before an unexpected call. Then within a month, we called the patient and outlined the proposal using consultation skills to give information, check understanding and address concerns.

If a patient agreed to switch, we issued a prescription, amended the repeat template and sent another Accurx message with a link to an Asthma UK video demonstrating inhaler technique and emphasising that this was a trial which could be reversed if necessary. We carried this out with limited patient numbers to assess our approach and refine as needed. This also limited potential queries coming back to practices each day in order to manage workload, often an unintended consequence of national targets for change.

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Comparative Analysis of the Capillary Blood Glucose Monitoring Systems recommended by NHS England guidelines

Giovanni Cucinotta, Diabetes Nurse Practitioner

Email: cucinottagiovanni311@gmail.com

LinkedIn: https://www.linkedin.com/in/giovanni-cucinotta-a773b173/

Abstract

To review and compare the recommended glucometers within category 2 (majority of people with Type 2 diabetes) of the recent NHS England recommendation guidelines.

Methods

This article is based on data obtained from available manufacturers' meter user guides, strip pack inserts and published studies. The studies were searched in two different databases in December 2023. The search was conducted on Pubmed and EBSCO CINAHL using a combination of 24 keywords which produced 244 results.

Conclusion

The paucity of published post-market studies and inadequate independent post-market surveillance is concerning. Despite all the investigated glucometers meeting the ISO standards, they showed a remarkable difference in their performance when compared. The accuracy and reliability of these glucometers can vary significantly when considering different interfering factors. The way the manufacturers report interferents is not standardised, which can make it difficult to compare different devices. When choosing a blood glucose monitoring system, healthcare professionals should use their clinical judgment and be aware of the limitations of the device they recommend/provide, as its accuracy may be impaired when used in some patients. Moreover, healthcare professionals should incorporate in their education, possible strategies to minimise preventable errors due to known interfering factors.

Keywords

Blood Glucose Monitoring Systems (BGMS); Self-monitoring of blood glucose (SMBG); Glucometer; NHS recommended glucometers.

List of Abbreviations

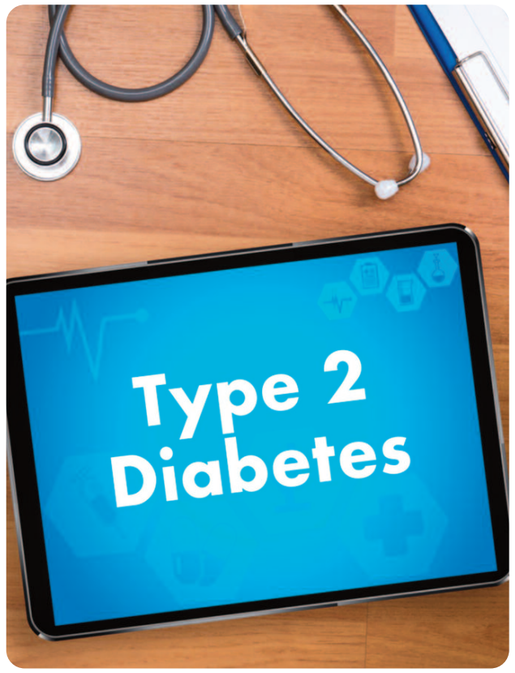
Blood Glucose Monitoring Systems (BGMS); Conformité Européenne (CE); Continuous Glucose Monitoring Systems (CGMS); European Association for the Study of Diabetes (EASD); Flavin-Dependent Glucose Dehydrogenase (FAD-GDH); Glucose Dehydrogenase (GDH); Glucose Oxidase (GO); International Organization for Standardization (ISO); Self-Monitoring of Blood Glucose (SMBG); Standard deviation (SD); The Food and Drug Administration (FDA).

Introduction

Over the last decade, we have witnessed a tremendous advance in technology, which has undoubtedly played a pivotal role in shaping the future of diabetes care. Despite the widespread use of continuous glucose monitoring systems (CGMS), traditional capillary blood glucose monitoring remains standard practice for the management of type 2 diabetes.[1] In fact, NICE still recommends self-monitoring of blood glucose (SMBG) for patients with type 2 diabetes who are on insulin and/or oral hypoglycaemic agents that might increase the risk of hypoglycaemia.[2] With a plethora of glucometers available on the market, choosing the right device may prove in a complex and daunting task. However, healthcare professionals can rely on guidelines to support their decisions and make the best evidence-based choice.

"This article aims to offer an independent review of the glucometers recommended for patients with type 2 diabetes, in category 2 of the recently launched NHS England guidelines.[3] In this category there are a total of 8 glucometers which are: AgaMatrix Agile; Menarini Diagnostics – GlucoFix Tech GK; Ascensia – Contour Plus Blue; Connect2Pharma – On Call Extra Mobile; GlucoRX – GlucoRx Q; Neon Diagnostics – Finetest lite; Sprit Health – CareSens S Fit; Trividia – TRUE Metrix Air."

It was noted that not all the devices were available on the market when these guidelines were produced. In particular, one glucometer, the AgaMatrix Agile, had not been launched by the time the NHS England guidelines were released,



nor when this review took place.[3] Despite attempts being made, it was not possible to retrieve technical information about this glucometer, consequently, it was not included in this review.

Literature review and published post-market studies

A literature review was conducted on Pubmed and EBSCO CINAHL using a combination of 24 keywords, which produced 244 results. The articles were further screened and the relevant studies were reviewed. The search was inconclusive for the majority of the glucometers. The CareSens S Fit was assessed in a study published in December 2023. This study compares 2 Conformité Européenne (CE) marked glucometers, the Caresens S Fit and the CareSens H, which are both produced by the same company.[4] A total of 5 studies were identified for the Contour Plus glucose monitoring system;[5,6,7,8] One of them was a comparative research study involving four different glucose monitoring systems.[9] Despite robust data supporting the Contour Plus device, none of the studies specifically investigated the Contour Plus Blue. Due to the scarcity of published post-market studies, this review was based solely on the published manufacturer's data obtained from strip inserts and user manuals.

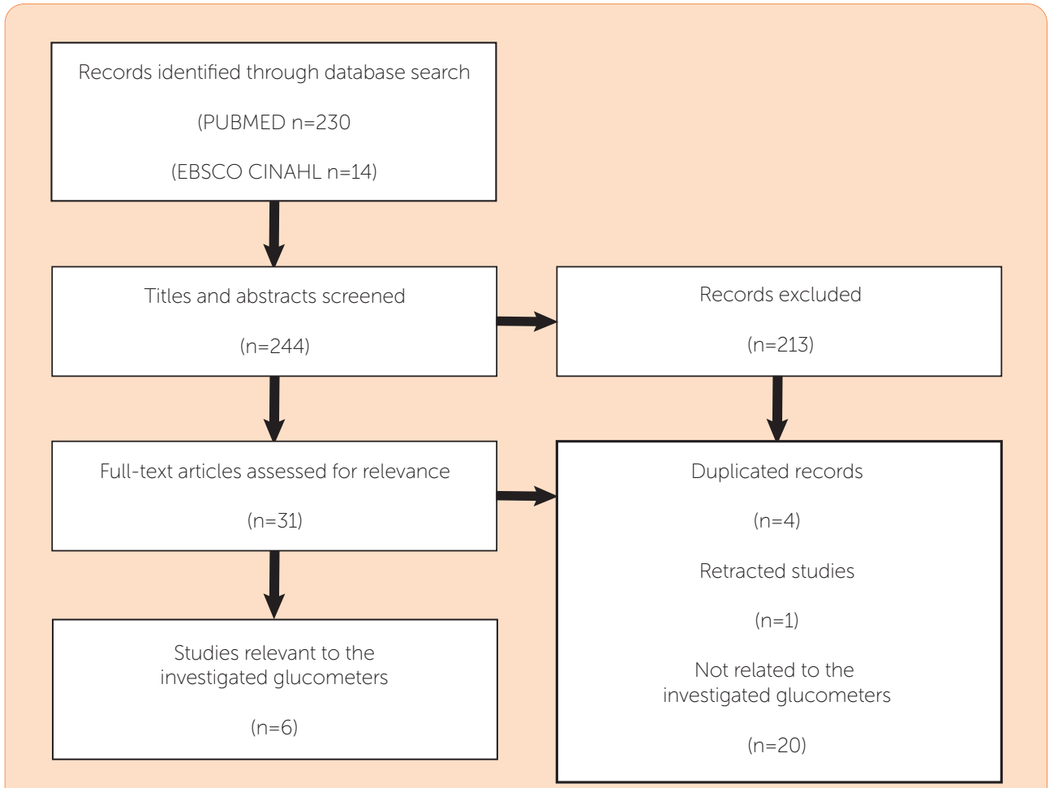


Figure 1. Literature review flowchart

Factors affecting glucometer accuracy and reliability

Accuracy is probably the most important factor to consider when choosing a glucometer. This parameter is strongly associated with hypoglycaemic risk, which increases with the magnitude of the error.[10] This implies that greater accuracy translates to better diabetes control, with the lowest hypoglycaemic risk possible. According to the current International Organization for Standardization ISO 15197:2013, glucometers should demonstrate that when comparing readings to a traceable laboratory method, at least 95% of BGMS results have to be within ±0.83 mmol/l (15 mg/dl) at glucose concentrations <5.55 mmol/l (100 mg/dl) and within ±15% at ≥5.55 mmol/l (100 mg/dl).[11]

In light of this, glucometers were stratified according to their overall accuracy, as shown in Table 1.

"When reviewing the data for the CareSens S Fit, it was noted that the accuracy reported on the glucose test strips and the one reported on the user manual, were not the same. As it was not possible to establish which results were correct, calculations for both sets of data have been reported."

Although all the meters met ISO standards, when analysing the overall accuracy, a substantial difference between the accuracy calculated at ± 15% and the one calculated at ± 5% can be noted. This variation was 37.19% ± (0.14) reported as mean ±

Meter	Overall Accuracy (±5%)	Overall Accuracy (±10%)	Overall Accuracy (±15%)	<5.55 mmol/l ±0.28mmol/l	<5.55 mmol/l ±0.56mmol/l	<5.55 mmol/l ±0.83mmol/l	≥5.55 mmol/l ±5%	≥5.55 mmol/l ±10%	≥5.55 mmol/l ±15%
Contour Plus Blue	86.7%	99.8%	100%	96.6%	100%	100%	82.6%	99.8%	100%
CareSens S Fit *(Test strip)*	60.7%	89.2%	97.7%	62.5%	89.1%	96.9%	59.8%	89.2%	98.0%
CareSens S Fit *(user manual)*	69.3%	95.8%	99.5%	65.6%	95.6%	100%	71.0%	96.0%	99.3%
Finetest Lite SMART	52.7%	89.5%	98.7%	55.4%	93.5%	100%	51.4%	87.7%	98.1%
Glucofix Tech GK	76.2%	98.2%	100%	68.8%	96.8%	100%	79.5%	98.8%	100%
Gluco Rx Q	47.5%	77.6%	98.0%	57.2%	86.2%	99.6%	43.6%	74.1%	97.4%
On Call Extra Mobile	58.3%	90.8%	99.7%	75.9%	100%	100%	52.0%	87.6%	99.6%
True Metrix Air	51.0%	83.2%	99.3%	63.5%	86.5%	99.4%	46.6%	82.0%	99.3%

Table 1. Accuracy values in percentage.

Overall accuracy is a cumulative value calculated considering samples respectively: within ±0.28mmol/l and ± 5%; within ±0.56mmol/l and ± 10%; within ±0.83mmol/l and ± 15%

This data was obtained from meters' user guides and strip pack inserts.

(SD), ranging from a minimum value of 13.3% to a maximum value of 50.5% (36.21% ± 0.14 using data from the user manual). This demonstrates a remarkable difference in the performance of these meters despite all satisfying the required standards. The meter that presented the minimum difference in accuracy variation was the Contour Plus Blue, whilst the one that presented the greatest variation was the GlucoRx Q, which outlined at ± 5%, over 50% of the readings would fall outside this error range.

Different factors can influence the accuracy of a BGMS. They can be intrinsic factors that are strictly related to the characteristics of a device and usually beyond user control, (Meter-inherent factors) or extrinsic factors, for instance, inappropriate hand washing.[12] Hematocrit is an important factor to consider, as it can have a great impact on the accuracy of BGMS. Indeed, it has been demonstrated that BGMS usually perform well at a hematocrit range of 30–55% while values lower or higher than this range will lead to inaccuracy.[12,13] This implies that glucometers using this hematocrit range may potentially produce inaccurate readings for 21% of patients when considering combined data from Africa and Europe while potentially affecting diabetes care for a much higher number of people globally.[13] Moreover, diabetic nephropathy or gestational diabetes are examples of common conditions where a hematocrit-dependent bias has been demonstrated and manufacturers may have failed to maintain the devices insensitive to hematocrit excursions.[14]

When stratifying glucometers per hematocrit ranges, it was noted that most of the devices had

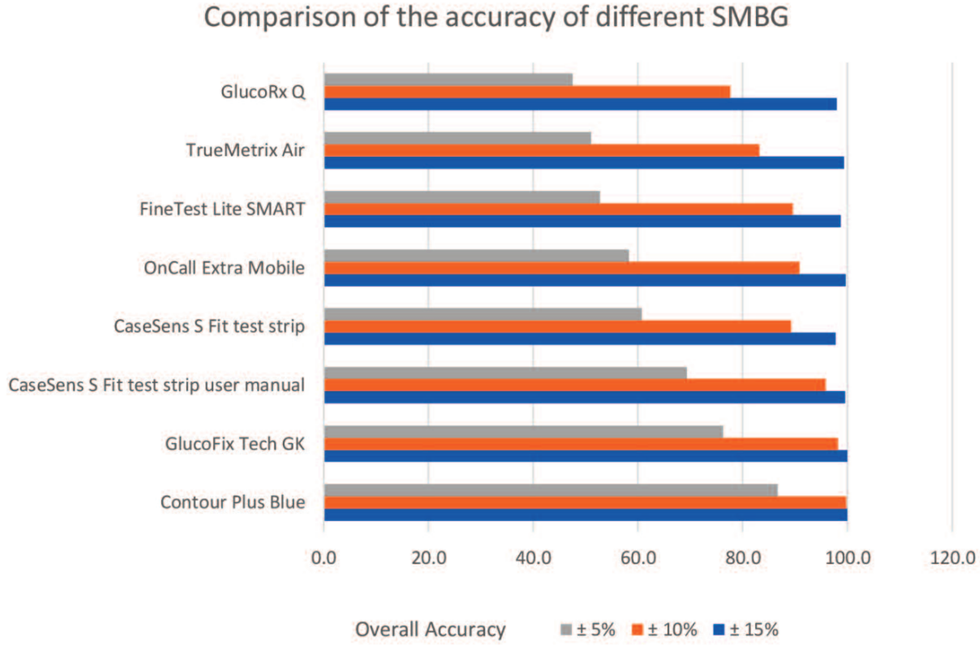


Fig 2. Comparison of the Overall Accuracy of the Investigated Glucometers

hematocrit ranges with a minimum tolerated value below 30%. GlucoRx Q appears to be the device that allows less tolerance to hematocrit excursion as it has the narrowest hematocrit range with the minimum value set at 30%, whilst Contour Plus Blue is the device that covers the wider hematocrit range with a minimum value as low as 0% (see Table 2).

Glucometer	Haematocrit Range
Contour Plus Blue	0% - 70%
CareSens S Fit	15% - 65%
Finetest Lite SMART	20% - 60%
Glucofix Tech GK	10% - 70%
GlucoRx Q	30% - 55%
On Call Extra Mobile	25% - 60%
True Metrix Air	20% - 70%

Table 2. - Overview of the glucometers according to the different recommended hematocrit levels

Hematocrit range expressed in percentage. (This data was obtained from meters user guides and strip pack inserts.)

Several substances (endogenous and exogenous) may affect the accuracy of BGMS. There might be a difference in the type of substances tested according to different guidelines. Although the list of substances tested by The Food and Drug Administration (FDA) largely overlaps with the ones tested by the ISO, the chemicals tested are not the same (FDA tests 26 substances, ISO only 24).[15] Moreover, when testing these interfering substances, the interactions amongst these substances are not taken into account, which can be seen for example, in polypharmacy.[15]

Oxygen is a well-recognised interfering substance that can cause artefactual blood glucose readings in patients with severe chronic obstructive pulmonary disease or on oxygen therapy.[12,16,17] However, oxygen is not included within the tested substances by the FDA, nor by the ISO.[15,18] For this reason, healthcare professionals should be aware of the limitations of certain blood glucose monitoring systems when providing/prescribing a device. It has been demonstrated that some technologies may be more oxygen-sensitive than others. In particular, devices that use glucose oxidase (GO) seem to be more susceptible to interference when compared to

glucose dehydrogenase (GDH).[12,16] This was confirmed by scrutinising the manufacturer information for the proposed glucometers. Four out of seven glucometers were reported to be sensitive to oxygen variations or not suitable for oxygen therapy. The glucometers that were suitable for oxygen therapy were all using a technology based on Flavin-dependent glucose dehydrogenase (FAD-GDH) enzymes (table 3).

Although all the proposed glucometers were tested for potential interferents as per ISO standards, not all glucometers can withstand the same concentration of a given substance, and they all present different safe limits. Due to the lack of standardisation in the way interferents are reported by the manufacturers, it was not possible to compare the devices and establish which glucometer presented the greatest tolerance to all the tested interfering substances. However, based on the warnings and limitations reported by the manufacturers, it was possible to ascertain which substances or factors were significantly affecting glucometers.

Glucometer	Technology	Suitable for oxygen therapy
Contour Plus Blue	FAD Glucose Dehydrogenase	YES
CareSens S Fit	Glucose Oxidase	NO
Finetest Lite SMART	FAD Glucose Dehydrogenase	YES
Glucofix Tech GK	Glucose Oxidase	NO
GlucoRx Q	Glucose Oxidase	NO
On Call Extra Mobile	Glucose Oxidase	NO
True Metrix Air	FAD Glucose Dehydrogenase	YES

Table 3 - Overview of proposed glucometers according to their suitability for oxygen therapy

(This data was obtained from meters user guides and strip pack inserts.)

For instance, Xylose, a carbohydrate found in foods designed for weight loss and used for decades to evaluate malabsorption in the small intestine, seems to impact the accuracy of GDH-based BGMS [19],[20]. Indeed, three of the seven investigated products presented warnings about the possibility of Xylose causing interference, especially during and shortly after Xylose absorption testing. However, there are no warnings from manufacturers on the possible impact of food containing Xylose. Two of the meters that reported warnings, the Finetest Lite SMART and Contour Plus Blue, were based on GDH and one, the On Call Extra Mobile, used GO technology.

Another interfering substance that was assessed was uric acid. This endogenous chemical is a waste product of purine degradation.[12,21] This can accumulate in the blood, for example in gout, kidney disease, and tumor lysis, which can be induced by chemotherapy.[12,21] Hyperuricemia is defined as a concentration of uric acid greater than 6 mg/dL in women and 7 mg/dL in men.[21] One meter, the True Metrix Air, reported warnings about significant interference with uric acid. The threshold above which the accuracy of this meter can be significantly impaired is 0.3 mmol/l (5.4 mg/dl). It is worth noting that this value lies within a physiological range of uric acid and that up to 90% of people affected by hyperuricemia are asymptomatic.[21,22]

Some environmental factors can affect the accuracy of BGMS. Temperature, humidity and altitude are some of these factors that it was possible to compare (see Table 4).

"The combination of high temperature and humidity has been proven to affect the accuracy of glucometers, especially if the shift in temperature is very rapid.[23,24] All the investigated glucometers seem to have a good tolerance to high temperatures, as four out of seven meters can tolerate a temperature up to 45°C and a humidity of 90% or even higher."

Altitude is another environmental factor that may jeopardise the accuracy of glucometers. In particular, altitudes above 2000 meters.[12] This can be significant as glucometers have been shown to underestimate glucose levels by approximately 1–2% for every 300 meters of elevation.[25] The majority of the glucometers reviewed in this article withstand an altitude of around 3000 meters. However, the Contour Plus Blue meter stands out compared to the other meters, as it can withstand an altitude that is twice as much (6301 meters).

Glucometer	Operating Temperature range	Operating Humidity	Altitude
Contour Plus Blue	5-45 °C	10%-93%	6301m
CareSens S Fit	5–45 °C	10–90 %	3000 m
Finetest Lite SMART	10-40 °C	10–90 %	3048 m
Glucofix Tech GK	5-45 °C	20%-90%	3150 m
GlucoRx Q	10-40 °C	Humidity below 85%	3275 m
On Call Extra Mobile	5-45 °C	10%-90%	3048 m
True Metrix Air	5-40 °C	10%-90%	3109 m

Table 4. Environmental factors affecting accuracy

(This data was obtained from meters user guides and strip pack inserts.)

Conclusion

The paucity of post-market literature on these meters reflects the serious concerns raised by the European Association for the Study of Diabetes (EASD) in their statement.[26] EASD states that despite CE-marking being a mandatory step to guarantee the safety of any medical device, it does not give any assurance as to the quality of a product. Reliable devices should comply with the international standard ISO 15197:2013.[11] However, the accreditation process for the ISO 15197:2013 standards is a one-time-only process, which does not give any reassurance that the accuracy and precision of glucometers are maintained over time.[27] Concerning data has been reported showing that 46.4% of the glucometers on the market fail to comply with ISO 15197:2013 after approval.[28] Some glucometers, also presented remarkable lot-to-lot variability between test strip lots.[29]. Moreover, in the UK, the responsibility of post-market surveillance and vigilance of medical devices falls solely on manufacturers, who are required to submit vigilance reports to the MHRA and take appropriate safety action when required.[30] Consequently, it could be argued that robust post-market data in the context of independent post-market surveillance are key to guaranteeing that glucometers' performance will continue to adhere to standards over time.[26,27,28]

The scarcity of post-market studies, lack of independent post-market surveillance, and gaps in the standardisation process highlighted in this review, may put blood glucose monitoring systems at an increased risk of inaccuracy with possible repercussions for users. Although guidelines are a valuable tool to support healthcare professionals with clinical decisions, they may present some pitfalls. The performance of the glucometers recommended in the NHS England guidelines can be very dissimilar, especially when different clinical scenarios are considered. To minimise possible errors and maximise the accuracy of blood glucose readings, it is paramount to be aware of intrinsic factors, such as meter inherent factors. These factors should be contextualised according to patients' characteristics and comorbidities. It can be difficult to compare different devices due to the lack of standardisation in the way manufacturers report interfering factors and their concentrations.

However, from an accurate analysis of the available information, it was possible to conclude that some glucometers presented significant limitations when used during oxygen therapy, in patients prone to hyperuricemia or patients with significant variations of hematocrit levels. Conversely, one particular meter presented greater flexibility and capacity to withstand most of the interfering factors. This implies that the responsibility for choosing the most reliable glucometer falls on the healthcare professionals who will need to evaluate the strengths and limitations of different glucometers and establish which device may offer the lowest risk of inaccurate blood glucose readings according to patient characteristics.

Despite the high performance of these glucometers, it is important to bear in mind that the accuracy and reliability of their results may be affected by extrinsic factors, such as user education.[31] In fact, it has been shown that by re-educating patients the accuracy of the results obtained after the education significantly improves.[32] Consequently, healthcare professionals should provide comprehensive education that not only focuses on the practical steps necessary to correctly perform a blood glucose test but also incorporates possible strategies to minimise preventable errors due to known interfering factors.

Ethical approval

Whilst ethical approval was not required for this article, ethical considerations have been respected throughout.

Conflict of interest

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