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Balancing clinical practice with research is very challenging, but it is highly rewarding

Q1 In 2021 you were awarded the Award for Outstanding Early Career Researchers in the UK and Ireland by the Royal College of General Practitioners, London, UK. Could you describe your path from beginning your medical education to this achievement?

That seems a long time ago now, 2021, but my journey in medicine began at the University of Ghana, where I developed a strong interest in primary care and public health care. This foundation led me to the UK, where I completed further training and started focusing on diabetes care. Over the past years, I have had the privilege of working alongside some esteemed colleagues and mentors at the Leicester Diabetes Centre, UK, and they have guided and supported my research. This award from the Royal College of General Practitioners in 2021 is, in my opinion, a recognition of the collaborative efforts that I've had in improving diabetes care in primary care settings, particularly in underserved populations.

Q2 Given your extensive experience in both clinical practice and research, how do you balance your roles as a practising general practitioner (GP) and a primary care research fellow? Also, how does your hands-on experience with patients influence your research?

Balancing clinical practice with research is very challenging, but it is highly rewarding. It's something that I would recommend to everybody. My work as a GP allows me to stay grounded in the realities of patient care, which, in turn, informs my research. Seeing firsthand the challenges that patients and people with diabetes face motivates me to explore practical solutions through research. These insights gained from my encounters with patients also ensure that my research remains very relevant and patient-centred, ultimately leading to improved care delivery.

Q3 As the Vice-Chair of Research for Primary Care Diabetes Europe (PCDE), could you explain what your role entails and how the PCDE's work impacts patient care?

I've held that position for a while now as I am in my second term in office as the Vice Chair of Research for PCDE, and I lead initiatives that focus on improving diabetes management in primary care across the whole of Europe. Our work is centred around providing evidence-based guidance and training for healthcare professionals, which directly impacts the care that patients receive. We also generate a lot of research material that translates into everyday practice, so the role allows me to contribute to shaping diabetes care policies in practices that will benefit patients on a broader scale than just in the UK.

Q4 Given your extensive work with continuous glucose monitoring (CGM) and the National Institute for Health and Care Excellence (NICE) guidelines, implemented in March 2023, which allow CGM use in primary care, what are your thoughts on the future of CGM in managing diabetes, especially for elderly patients and those with complex comorbidities?

Yes, my work on CGM has taken off over the past 24 months, and CGM represents significant advancements in diabetes management in recent times, particularly in the primary care setting. CGM provides real-time data on glucose levels, which can transform how patients manage their diabetes. By offering continuous feedback rather than intermittent data provided by the traditional finger prick testing that we've always been doing. This continuous stream of information then allows both the patient and healthcare professionals to observe the glucose trends and identify the patterns and then make timely adjustments to treatment plans.

Elderly patients will normally have very complex co-morbidities, and CGM offers several distinct benefits. These populations are often faced with challenges in managing diabetes due to the combination of not just physiological factors but also polypharmacy and the increased risk of hypoglycaemia, especially when these patients are using insulin or insulin secretagogues, which sadly is still widely the case. CGM can significantly reduce the risk of hypoglycaemia by alerting the patients and their caregivers to any impending low glucose levels, allowing for timely interventions. This is particularly important for elderly patients who may have impaired awareness of their hypoglycaemia, which is a condition where the typical warning symptoms are not felt, making them more susceptible to severe hypoglycaemia.

There are a lot of benefits; moreover, CGM can contribute to better overall glucose control without the need for finger prick testing, which can be cumbersome and painful in some patients. The ease of use and the ability to review their glucose trends over a long period of time improves not just the adherence to treatment regimens but also leads to long-term outcomes; we've seen that in various studies across the world. The best one that is normally cited is the relief study from France, but we in the UK have also got some real-world data published from the UK. So, for patients with complex, long-term conditions, glucose monitoring can help healthcare providers understand how the conditions or the medications may affect the glucose levels, allowing for more nuanced and individualised care.

What we're noticing is that more and more primary care clinicians are getting more familiar with CGM technology, and it is expected to become the standard tool for managing patients with both Type 1 and Type 2 diabetes, particularly those at high risk of complications.

The NICE guidelines endorsement of CGM in primary care is a crucial step in broadening access to this technology. Its' adaptation is now increasing across the country, and we can anticipate significant improvements in both quality of life and clinical outcomes in patients.

Q5 In 2023 you co-authored a paper investigating the under-representation of Black patients in clinical trial populations for diabetes treatment. What are the implications of these findings, and what steps do you think should be taken to ensure that future trials are more inclusive?

That was a study that we published, which gathered a lot of media attention at the time. The study highlighted a critical issue in the landscape of diabetes research: the significant underrepresentation of Black patients in clinical trials for diabetes treatments. This lack of diversity in the trial population is concerning because it limits the generalisability of research findings, potentially leading to disparities in the treatment outcomes for different racial and ethnic groups.

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This underrepresentation means that the effectiveness and safety profiles of these treatments might not be fully understood in that population group. We also find similar underrepresentation of South Asian populations. Interestingly, what we found that gathered more attraction across the media was the fact that the benefits seen in GLP-1 receptor agonists and SGLT2 inhibitors were not as marked for Black patients as observed in other ethnicities(White Europeans and South Asians). This was very interesting, given that South Asians were also seen to be underrepresented, they seem to have had benefits compared to Black patients.

It means that a lot of research activity is needed in this area to understand whether these findings were actually square of statistics, or due to the poor representation, or a real finding, we don't know.

One of the implications of these findings is that the current body of evidence may not accurately reflect how Black patients respond to diabetes treatments, potentially leading to suboptimal care. To address this, we recommend several steps to ensure future trials are more inclusive. First of all, trial design should intentionally include recruitment strategies that target underrepresented populations, ensuring that the sample sizes are large enough to allow for subgroup analysis. Then there should also be greater transparency and reporting on the demographic breakdown of trial participants so that gaps in representation can be identified and addressed. It should be added that engaging with communities to build trust and reduce barriers to participation is very crucial. This might involve collaborating with community leaders and providing culturally competent education and educational activities about the importance of clinical trials, to ensure that trial designs are accessible and relevant to the diverse populations that we serve.

Q6 Recent studies have suggested a use for AI models in the analysis of data from continuous glucose monitoring. As a GP, do you see a future place for AI in diabetes management?

When I look into the future, I think the integration of CGM with other technologies, such as AI and telemedicine, holds great promise.

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AI algorithms could enhance diabetes management, particularly in interpreting the vast amount of data generated by CGM devices, as you're getting minute-by-minute readings, and it's a huge amount of data. AI could analyse CGM data and indeed provide personalised recommendations by predicting glucose trends, potentially reducing the burden on the healthcare systems by enabling remote monitoring. In elderly patients, this could mean more consistent and responsive care with fewer in-person visits as we do at the moment, thereby reducing the strain on both the patient and the healthcare providers. However, it's worth noting that it's important to ensure that these tools are integrated thoroughly into clinical pathways with a focus on supporting rather than replacing clinical judgement.

Q7 As an active researcher with over 130 publications on PubMed, could you share any studies you are currently working on and your future goals in diabetes research?

Currently, I'm leading several important research initiatives that aim to address critical gaps in diabetes care and management. One of the key areas of my research focus, at the moment, is on therapeutic inertia in Type 2 diabetes. Here we utilise real-world data to understand the factors that contribute to delays in treatment intensification, or indeed initiation, which is a significant issue in diabetes care, especially in primary care. Therapeutic inertia can lead to prolonged periods of inadequate glycaemic control, increasing the risk of complications for the patients. So, by analysing data from routine physical practice, we can identify strategies to overcome these barriers and ensure that patients receive timely and appropriate treatment adjustments.

Another area of my work involves investigating cardiometabolic conditions in Sub-Saharan Africa.Recently, I've been doing some work on Global Health and this region faces a growing burden of non-communicable diseases, including diabetes and cardiovascular diseases, yet it remains under-researched compared to infectious diseases in that part of the world. From the Leicester Diabetes Centre, we collaborated with colleagues

across Africa, doing research activities that seek to understand the unique challenges and indeed opportunities for managing these conditions in Sub-Saharan Africa, with a special focus on developing and evaluating context-specific interventions that can improve health outcomes in these communities.

I am also involved in evaluating different models of diabetes care, particularly within the primary care setting, and my work has focused on assessing the effectiveness of integrated care models that bring together primary, secondary, and community care to manage diabetes more effectively. These models aim to provide comprehensive and continuous care for patients, and I think it is crucial for managing chronic conditions like diabetes. The evaluation of the models is essential to identify best practices shared across the rest of the country.

Looking ahead, my future goals in diabetes research include continuing to explore ways to optimise diabetes care in diverse settings. Health inequality is a big issue, particularly in low-resource environments. I also aim to further investigate the impact of digital health technologies, such as CGM and AI, on diabetes management with a focus on enhancing patient outcomes and reducing health inequalities.

Q8 What advice would you give to healthcare professionals who are aspiring to pursue clinical academia?

My advice for up-and-coming, early-career researchers and clinicians would be to stay curious and committed to improving patient care. I think that has got to be the main focus, continuous learning. Clinical academia offers a unique opportunity to bridge the gap between research and practice, but it requires a lot of perseverance and collaboration.

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You cannot do it on your own, you've got to collaborate. So, seek out mentors, stay connected to clinical practice, and always keep the patient at the centre of your work.