Reaping the benefits of System C CareFlow Medicines Management platform with integrated clinical decision support from FDB

Glasgow Queen Elizabeth University Hospital and a wider team across NHS Glasgow and Clyde have been successfully using the System C CareFlow Medicines Management platform with FDB's Multilex clinical decision support to enhance patient safety since 2020.

The CareFlow Medicines Management (CMM) Electronic Prescribing and Medicines Administration (EPMA) and Pharmacy platform was rolled out across the Glasgow area after a stringent tender process in 2020. The Hospital Electronic Prescribing and Medicines Administration (HEPMA) project replaced the paper drug chart that was used by doctors and other prescribers across the area in order to prescribe medicines. It is also used to carry out drug rounds and record the administration of medicines by nurses.

CareFlow EPMA enables electronic prescribing, administering, and clinical verification of prescriptions across healthcare settings and is the UK's most widely used e-prescribing solution in hospitals and community care facilities.

The solution incorporates FDB Multilex - the UK's leading clinical decision support solution - to facilitate active clinical checking and enhance medicines safety. When integrated with an electronic prescribing solution, Multilex offers extensive clinical checking for drug interactions, dosing guidance, allergy alerts, and duplicate therapy

checks. Trusted by numerous NHS organisations, Multilex is renowned for its ability to significantly reduce medication errors and enhance patient safety.

The hospital initially focused on the roll out of CareFlow EPMA, with a pilot that began with a five ward roll out in 2020. After a successful pilot at Queen Elizabeth University Hospital on the respiratory wards, the team at Glasgow have now rolled out across 17 sites and 353 wards. There are now around 1.8 million patients on the system, with around 10,000 prescriptions and about 80,000 administrations per day.

"It was really important that the solution we chose fitted the stringent safety criteria. Several other health boards had been using CareFlow EPMA for some time, one - Ayrshire and Arran, had been using the System C solution for 20 years. The length of usage and the patient safety stats we saw played a part in our decision-making process."

ROBERT PUCKETT *Lead HEPMA Pharmacist, NHS Greater Glasgow & Clyde*

Background to roll out of CareFlow EPMA

Robert Puckett is Lead HEPMA Pharmacist at NHS Greater Glasgow & Clyde and has been an instrumental team member in the roll out and implementation of the solution. The deployment followed a three-year Scotland wide-tender, which included a very strict selection of operational requirements. Glasgow carried out their own procurement from the three selected suppliers in 2019 and chose to use the CareFlow EPMA.

The HEPMA Programme Board identified key priority areas to be optimised: missed doses, allergy alerts and overrides. The new solution alerts prescribers to allergy and medication interactions and when regular medications are due, neither of which existed in the solution used before.

Problem: What motivated the board to choose CMM's solution, and how clinical decision support played a role in this decision?

Before the implementation of CareFlow EPMA, the board used a paper-based system which had presented some challenges in managing medication interactions – challenges which, in some cases, potentially impacted on patient safety. These incidents underscored the need for a more robust solution like CareFlow EPMA with integrated Multilex clinical decision support, helping to streamline processes and enhance patient safety. The board also wanted to incorporate more accurate, legible prescriptions and save time during drug rounds. They also wanted a more optimised use of medicines and more consistent medicines practice.

Successful pilot leads to full roll out of HEPMA / EPMA

After a successful pilot, the HEPMA Team worked closely with clinical teams and the HEPMA Programme Board to roll out to Queen Elizabeth University Hospital campus, Glasgow Royal Infirmary campus, Royal Alexandra Hospital and Inverclyde Royal Hospital plus several smaller sites, the board's mental health hospitals and the Royal Hospital for Children, a large tertiary paediatric hospital. Rob says: "The success of the pilot was possible due to the engagement and enthusiasm of the clinical teams, working closely with the HEPMA Team to ensure that users received the support they needed to get the most out of the solution."

Clinical staff completed eLearning packages and were supported by the HEPMA Facilitator Team with additional training to staff in clinical areas. It was reported that nurses and doctors found the system easy to use and got to grips with it quickly. The solution is now deployed across the whole patch and is used across 353 wards.

Benefits of using EPMA and integrated clinical support in business as usual

There are now around 1.8 million patients on the system, with around 10,000 prescriptions and about 80,000 administrations per day.

Immediate benefits to the teams using clinical support within HEPMA include legibility of prescriptions and clinical decision support, leading to enhanced patient safety. The solution is saving time during drug rounds while providing richer information on medicine usage, optimising medication management and ensuring more consistent prescribing practices.

Rob says: "For my work as a pharmacist, the solution is great. It automatically warns prescribers about interactions and allergies at the point of prescribing, which is something prescribers would simply not have picked up on with the old paper-based system. In a large health board like Glasgow - where there is so much prescribing - interactions could easily be missed with the old system. From the Board's point of view – they wanted something that would reduce our overall risk of that type of error. With a single electronic system, it is easier to make improvements across the whole system that have been identified as part of learning from clinical incidents. Multilex clinical decision support is ideal and it's a great tool."

Rob continues: "As the solution has very good audit functionality, you can see where we have incidents, it's where people have ignored the warning. You can see very easily where the warnings have been looked at and what the prescriber has done with warning. When we were using paper, this was obviously impossible and is very good that we can now do this."

Outcomes and Impact

A benefits realisation analysis conducted in 2022 by Dr Samantha Coulter and Nicole Paterson highlighted significant improvements following the introduction of HEPMA. Key findings included a reduction in missed doses from 27% to 5% and improved allergy status recording, with only 9% of allergy statuses missed compared to 17% on paper-based systems.
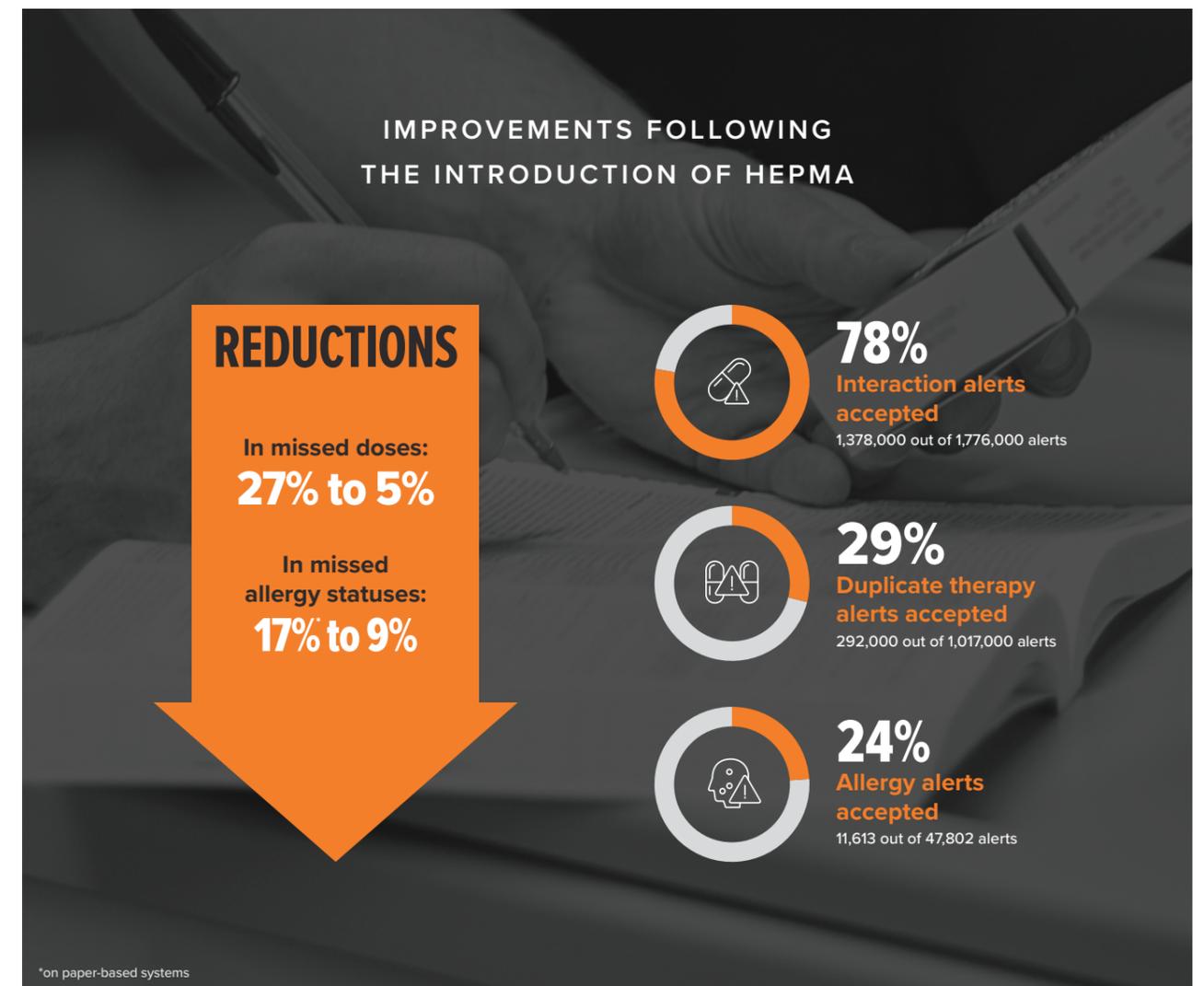
These early results underscored the system's potential to improve medication management, aligning with the HEPMA business case themes of better care, workforce, value, and health.

Dr Samantha Coulter explains: "HEPMA benefits patients by reducing the number of missed doses and medication interactions. This engages users as they can easily see when medications are due and also educates users on medication interactions and easily alerts them to patient allergies. These objectives reduce the possibility of patient harm and prolonged hospitals stays."

Building on the 2022 findings, data from 2024 demonstrates continued success with 78% of critical interaction alerts being heeded, 29% of duplicate therapy warnings accepted, and 24% of allergy alerts heeded.

This progression highlights the system's scalability and its role in driving consistent improvements in patient safety.

Rob concludes: "The fact that we can monitor so many prescriptions at all is a game changer. As a ward pharmacist, this was my day-to-day bread and butter work - ensuring medications were used safely and effectively. The clinical decision support is a godsend. It can be so easy to cause harm without realising it, especially when prescribing is often done by the most junior colleagues, who are also the least experienced. That increases risk, but with CareFlow EPMA and integrated Multilex clinical decision support, we know we have critical checking in place. We really value the support it provides and the knowledge it brings by flagging potential issues before they become problems."

IMPROVEMENTS FOLLOWING THE INTRODUCTION OF HEPMA

REDUCTIONS

In missed doses:
27% to 5%

In missed allergy statuses:
17% to 9%

78%
Interaction alerts accepted
1,378,000 out of 1,776,000 alerts

29%
Duplicate therapy alerts accepted
292,000 out of 1,017,000 alerts

24%
Allergy alerts accepted
11,613 out of 47,802 alerts

*on paper-based systems

"System C have been in partnership with FDB for nearly 30 years. Our long-established relationship has offered significant benefits to our joint customers through their comprehensive coverage of medicines information relative to UK clinical practice. This enhances our offering for clinical decision support and access to information for clinicians at the point of use of HEPMA."

STEVE REGGIONE *Product Director Clinical, System C*

"It's incredibly exciting to work with organisations like NHS Greater Glasgow & Clyde and System C, who share our passion for innovation in healthcare. By collaborating closely, we are able to continually enhance patient safety and streamline medicines management. Collaborating means that we're constantly innovating, and with advancements in areas like pharmacogenomics, there's even more potential to transform prescribing and patient care in the future."

DARREN NICHOLS *Managing Director, FDB*

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