Press release

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New study shows AI can identify risks and prevent harm for patients prescribed multiple medicines

A ground-breaking use of AI in primary care could prevent patients prescribed multiple medicines suffering harm by identifying risks before they occur, according to a new study. In addition to improving patient care and potentially saving lives, the study found the potential to save the NHS millions of pounds and free up thousands of hospital beds.

The project, run by Operose Health's clinicians, technology, and data experts, used artificial intelligence to identify patients at risk due to polypharmacy - the regular use of over five prescription drugs.

Welcoming the study's findings, Dr Tarek Radwan, GP Director said:

"The impact of this study should not be under-estimated, as it clearly demonstrates the benefits of integrating AI with large scale data for patients, clinicians and the NHS. It is vitally important that we recognise when harm could be caused by the interaction of a person's different medicines. The findings of our study show we can use data and AI to quickly identify potential risks across large groups of people and take action before their health is impacted."

This work was published in the leading International Journal of Environmental Research and Public Health in June this year. In the study, AI was added to our in-house population health management platform (known as EZ Analytics), and analysed over 300,000 patient records to identify patients at risk from polypharmacy.

The study's key findings were:

- Using AI with large data sets improved patient outcomes by identifying high anticholinergic drug burdens in identified patient groups before any symptoms presented or harm occurred.

- AI was highly effective in its ability to self-identify clusters of patients at the highest risk of polypharmacy using real-world data analysis of over 300,000 patients and calculating a weighted drug interaction risk score for each individual.
- Integrating AI with our population health management platform automatically identified groups at risk far faster than through manual inspection of patient records.
- This AI-driven approach was considerably less labour-intensive, freeing up clinical time to assess and support the higher-risk patients, rather than spending time identifying them.

Yvette Agyako, Lead Pharmacist said:

"The use of artificial intelligence in the management of complex polypharmacy medication reviews has been amazing. Without AI, the process of identifying the risk for our patients would have been difficult and very time consuming. However, now we can easily identify all patients at risk and systematically review them, prioritising those with the greatest risk."

Polypharmacy can give rise to adverse drug reactions (ADRs) where the effect of one drug is changed in the presence of other drugs, potentially resulting in increased toxicity. Approximately 10% of consultations in primary healthcare are related to ADRs and 60–70% of serious ADRs are preventable but are often inadvertently overlooked due to the complexity of the issue, availability of data and clinical knowledge.

Research estimates the prevalence of polypharmacy ranges from one-third to two-thirds with older patients and is also common for those with multiple long-term conditions. With ageing, the risk of developing chronic diseases and ADRs related to multiple drug prescriptions increases. Prolonged use of anticholinergic and sedative medications is highly correlated with worsening cognition and decline in physical functions among the elderly.

The latest estimated cost per year of avoidable drug-related problems for the NHS was close to £100m, accounting for over 180,000 bed-days per year.

Notes to editors

1. Operose Health manages 66 GP practices across England, providing NHS primary care services for more than 640,000 patients, with 97% of our sites rated as Good or Outstanding by the Care Quality Commission.
2. Our work to develop the EZ-Analytics population health tool and then integrate the data with AI has previously achieved two Certificates of Excellence with the highest score (Outstanding), awarded by UKRI (Innovate UK).
3. Click here for a fuller case study of this study, please click here
4. For more information, please email stephen.webb@operosehealth.co.uk