

Electronic prescribing systems in hospitals to improve medication safety: a multimethods research programme

Aziz Sheikh,^{1*} Jamie Coleman,² Antony Chuter,³
Robin Williams,⁴ Richard Lilford,⁵ Ann Slee,⁶
Zoe Morrison,⁷ Kathrin Cresswell,¹ Ann Robertson,¹
Sarah Slight,⁸ Hajar Mozaffar,¹ Lisa Lee,¹ Sonal Shah,²
Sarah Pontefract,² Abby King,¹ Valeri Wiegel,¹
Samuel Watson,⁵ Nde-Eshimuni Salema,⁹
David Bates,¹⁰ Anthony Avery,⁹ Alan Girling,⁹
Lucy McCloughan¹ and Neil Watson¹¹

¹Usher Institute, University of Edinburgh, Edinburgh, UK

²Institute of Clinical Sciences, University of Birmingham, Birmingham, UK

³Lay member, UK

⁴School of Social and Political Science, University of Edinburgh, Edinburgh, UK

⁵Institute of Applied Health Research, University of Birmingham, Birmingham, UK

⁶NHS England, London, UK

⁷Aberdeen Business School, The Robert Gordon University, Aberdeen, UK

⁸School of Pharmacy, Newcastle University, Newcastle upon Tyne, UK

⁹School of Medicine, University of Nottingham, Nottingham, UK

¹⁰Brigham and Women's Hospital, Boston, MA, USA

¹¹Newcastle Upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK

*Corresponding author aziz.sheikh@ed.ac.uk

Declared competing interests of authors: David Bates is a co-inventor on patent number 6029138, which is held by Brigham and Women's Hospital (Boston, MA, USA), on the use of decision support software for medical management, held by Medicalis Corporation (Kitchener, ON, Canada). He also holds a minority equity position in the privately held company Medicalis Corporation, which develops web-based decision support for radiology test ordering, and served on the board for SEA Medical Systems (Emerald Hills, CA, USA), which makes intravenous pump technology (2012–20). David Bates is on the clinical advisory board for Zynx Health Inc. (Los Angeles, CA, USA), which develops evidence-based algorithms, consults for EarlySense (Ramat Gan, Israel), which makes patient safety monitoring systems, and received cash and equity from QPID Inc. (Boston, MA, USA), a company focused on intelligence systems for electronic health records. He also receives cash compensation from CDI Ltd (Negev, Israel), which is a non-for-profit incubator for health IT start-ups, receives equity from Enelgy (Northridge, CA, USA), which makes software to support clinical decision-making in intensive care, and receives equity from MDClone (Tel Aviv-Yafo, Israel), which takes clinical data and produces deidentified version of them. David Bates receives equity from ValeraHealth (Brooklyn, NY, USA), which makes software to help patients with chronic diseases, and equity from Intensix (Los Angeles, CA, USA), which makes software to support clinical decision-making in intensive care.

David Bates' financial interests have been reviewed by Brigham and Women's Hospital and Partners HealthCare (now Mass General Brigham) (Boston, MA, USA) in accordance with their institutional policies. Lisa Slee reports personal fees from NHS England and PCS Health Ltd (Chester, UK) outside the submitted work. Sarah Slight is a member of the Health Technology Assessment Primary Care, Community and Preventive Interventions Panel.

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Plain English summary

ePrescribing in hospitals for medication safety

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Plain English summary

Electronic prescribing (ePrescribing) systems allow health-care professionals to enter prescriptions and manage medicines using a computer. We set out to find out how these ePrescribing systems are chosen, set up and used in English hospitals.

Given that these systems are designed to improve medication safety, we looked at whether or not these systems affected the number of prescribing errors made (mistakes such as ordering the wrong dose of medication). We also tried to see whether or not the systems were good value for money (or more cost-effective). Finally, we made recommendations to help hospitals choose, set up and use ePrescribing systems.

We found that setting up ePrescribing systems was very difficult because there is a need to take into consideration how different pharmacists, nurses and doctors work, and the different work that needs to be carried out for different diseases and medical conditions. We recorded a link between the implementation of ePrescribing systems and a reduction in some high-risk prescribing errors in two out of three study sites. Given that the error reductions corresponded to the warnings triggered by the system, we concluded that the system is likely to have caused the error reduction.

Prescribing errors may lead to adverse events that lead to death, impaired quality of life and longer hospital stays. The cost of an ePrescribing system increased in proportion to reduced errors, reaching £4.31 per patient per year for the site that experienced the greatest reduction in prescribing errors (i.e. site S). This estimate is based on assumptions in the model and how much a health service is willing to pay for a unit of health benefit.

To help professionals choose, set up and use ePrescribing systems in the future, we produced an online ePrescribing Toolkit (www.eprescribingtoolkit.com/; accessed 21 December 2019) that, with support from NHS England, is becoming widely used internationally.

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