HSIB

HEALTHCARE SAFETY INVESTIGATION BRANCH

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SUMMARY REPORT

ELECTRONIC PRESCRIBING AND MEDICINES ADMINISTRATION SYSTEMS AND SAFE DISCHARGE

Healthcare Safety Investigation I2018/018

October 2019 Edition


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HEALTHCARE SAFETY
INVESTIGATION BRANCH

PROVIDING FEEDBACK AND COMMENT ON HSIB REPORTS

At HSIB we welcome feedback on our investigation reports. The best way to share your views and comments is to email us at **enquiries@hsib.org.uk** We aim to provide a response to all correspondence within five working days.

www.hsib.org.uk/tell-us-what-you-think

ABOUT HSIB

The Healthcare Safety Investigation Branch (HSIB) conducts independent investigations of patient safety concerns in NHS-funded care across England.

Most harm in healthcare results from problems within the systems and processes that determine how care is delivered. Our investigations identify the contributory factors that have led to harm or have the potential to cause harm to patients. The recommendations we make aim to improve healthcare systems and processes in order to reduce risk and improve safety.

Our organisation values independence, transparency, objectivity, expertise and learning for improvement.

We work closely with patients, families and healthcare staff affected by patient safety incidents, and we never attribute blame or liability to individuals.

OUR INDEPENDENCE

We are funded by the Department of Health and Social Care and sponsored by NHS England and NHS Improvement, but we operate independently.

Following recommendations from a parliamentary select committee in August 2018, a Bill for establishing the Health Service Safety Investigations Body (HSSIB) was introduced in the House of Lords on 15 October 2019. The Bill seeks to enshrine our full statutory independence as a safety investigation body, and to provide us with wide-ranging powers to protect the identity of individuals and the information they provide during our investigations. It does not prevent us from sharing important details with families, regulators or organisations about an incident, or addressing immediate risks to patient safety. Further information about the Bill is available on the UK Parliament website.

A NOTE OF ACKNOWLEDGEMENT

We are grateful for the ongoing support and involvement of the family of Mrs Ann Midson, the patient whose experience is central to this report. Ann's name is used throughout this report at the family's request and her clinical details have been shared, with their consent.

OUR INVESTIGATIONS

Our team of investigators and analysts have diverse experience working in healthcare and other safety-critical industries and have expertise in human factors analysis, safety science and the design of safety management systems. We consult widely in England and internationally to ensure that our work is informed by appropriate clinical and other relevant expertise.

We currently undertake two types of patient safety investigation.

NATIONAL INVESTIGATIONS

Our national investigations can encompass any patient safety concern that occurred within NHS-funded care in England after 1 April 2017. The topics we select are informed by suggestions provided by healthcare professionals and the public, and our own analysis of NHS patient safety databases and reporting.

We decide what to investigate based on the scale of risk and harm, the impact on individuals involved and on public confidence in the healthcare system, as well as the potential for learning to prevent future harm. We welcome information about patient safety concerns from the public, but we do not replace local investigations and cannot investigate on behalf of families, staff, organisations or regulators.

Our investigation reports identify opportunities for relevant organisations with power to make appropriate improvements through:

- *'Safety recommendations'* made with the specific intention of preventing similar events happening in the future
- *'Safety observations'* with suggested actions for wider learning and improvement.

Our reports also identify 'safety actions', which are steps identified during an investigation as being immediately necessary to improve patient safety.

We ask organisations subject to our safety recommendations to respond to us within 90 days. These responses are published on the investigation pages of our **website**.

MATERNITY INVESTIGATIONS

Since 1 April 2018, we have been responsible for all patient safety investigations of maternity incidents occurring in the NHS in England which meet criteria for the **Each Baby Counts programme**.

The purpose of the HSIB maternity investigations programme is to achieve rapid learning and improvement in maternity services, and to identify common themes that offer opportunity for system-wide change. For these incidents HSIB's investigation replaces the local investigation, although the NHS trust remains responsible for meeting the Duty of Candour and for referring the incident to us.

We work closely with parents and families, healthcare staff and organisations during an investigation. Our reports are provided directly to the families involved and to the trust. The trust is responsible for actioning any safety recommendations we make as a result of these investigations.

Our longer-term aim is to make safety recommendations to national organisations for system-level improvements in maternity services. These recommendations will be based on common themes arising from our trust-level investigations.

EXECUTIVE SUMMARY

Introduction

HSIB has identified a significant safety risk posed by the communication and transfer of information between secondary care, primary care and community pharmacy relating to medicines at the time of hospital discharge. A reference event was identified that resulted in a patient inadvertently receiving two anticoagulant medications at the same time, possibly causing an episode of gastrointestinal (digestive tract) bleeding. Increasingly, healthcare facilities in primary and secondary care are introducing digital solutions (electronic prescribing and medicines administration (ePMA) systems) to improve medicines safety. However, analysis of the reference event identified how ePMA systems can create their own risks – risks that will need to be addressed as these systems become more widespread. Other risk factors relating to prescribing and the discharge of the patient, including medicines reconciliation, availability of pharmacy services and weekend working, were identified during the investigation.

The reference event

A 75-year-old woman, Mrs Ann Midson, was admitted to hospital during the early evening of a Friday in March 2018. Ann presented with a history of difficulty swallowing, vomiting and worsening shortness of breath; she had been diagnosed with incurable lung and kidney cancer in August 2017. In September 2017, she had commenced anticoagulant medication by self-administered injection (dalteparin) for atrial fibrillation[1], which had been diagnosed several years earlier.

On the Sunday that same weekend in March 2018, Ann was discharged from hospital in the afternoon. While in hospital, her prescription for dalteparin was stopped on the Trust's ePMA system and she was prescribed an oral anticoagulant medicine (apixaban) instead; this was to avoid the need for a daily injection. The day after she was discharged from hospital, Ann received her regular repeat prescription of dalteparin; this was dispensed from her local pharmacy, following an order submitted the previous week. Ann continued to take both dalteparin and apixaban at home.

Following discharge, Ann had a further four interactions with healthcare professionals from primary and secondary care; however, it was not recognised that she was taking two anticoagulant medications. The error was detected 15 days after discharge by a hospice nurse who visited Ann at home. The GP visited on the same day and stopped both anticoagulant medications. Ann declined admission to hospital for a blood transfusion to treat a possible gastrointestinal bleed.

Two days later, Ann was admitted to a hospice because her health had deteriorated. Ann died the following day, 18 days after being discharged from hospital and three days after the anticoagulation medication had been stopped.

National investigation

Safety risk

The safety risk regarding the prescribing of high-risk medication using both electronic and paper systems, spanning primary and secondary care, was initially identified through routine review of the Strategic Executive Information System (StEIS)[2], along with intelligence shared with HSIB through referrals.

The reference event highlighted the risks to patients cared for by more than one healthcare provider, caused by errors in communication between providers if they use different systems for patient records and prescriptions.

The primary care medical practice (Health Centre) involved in the reference event highlighted the incident to the Acute Trust and carried out a local investigation. The Trust conducted its own investigation following the reference event's escalation to a Serious Incident[3] on to the StEIS. HSIB identified the incident through a StEIS review, gathered additional information and assessed the incident against its investigation criteria. Consequently, the chief investigator authorised a national investigation.

The national investigation focused on:

1. the impact of ePMA systems on the safe discharge of patients, encapsulating the interface between primary and secondary care and communication with the patient/family

2. the influence of weekend working on patient safety in the context of the availability of support services and specialist input.

[1] Atrial fibrillation is an abnormal heart rhythm.
[2] The StEIS is a national database that facilitates the reporting of serious patient safety incidents and the monitoring of investigations between NHS providers and commissioners.
[3] Serious Incidents include acts or omissions in care that result in; unexpected or avoidable death, unexpected or avoidable injury resulting in serious harm (**https://improvement.nhs.uk/documents/920/serious-incidnt-framwrk.pdf**)

The following work was carried out during the investigation:

- observation of other electronic prescribing systems being used by trusts
- engagement with developers of electronic prescribing systems
- identification of current best practice by observation visits to Global Digital Exemplar (GDE) trusts
- identification of NHS England's strategic objectives for digitisation
- observation of electronic prescribing systems currently used in primary care
- identification of points of interface/data exchange between systems
- review of the national standards for weekend working, including the timing and extent of implementation of these standards
- identification of which support services operate nationally in hospitals on a seven-day working system without a reduction of services, and which services operate a reduced service at weekends
- review of how medical care is organised at weekends to ensure that patients are reviewed by appropriate specialists in accordance with the primary (main) diagnosis.

The investigation identified opportunities and systemic remedies to reduce the risk of medication errors occurring when using ePMA systems. The investigation and the report focus primarily on the use of ePMA systems in the context of safe discharge from secondary to primary care. However, the findings, safety recommendations and safety observations may be helpful when considering the development of other national patient safety initiatives, particularly those relating to the introduction of new systems.

Findings

The investigation found:

1 The reference event could have occurred with or without the ePMA system, and a well-configured ePMA system could have prevented the error.

2 A single system of medicines administration that supports both hospital and self-administration is the optimal approach.

3 There was no standardised discharge process in place, incorporating a discharge summary that interfaced with the ePMA system and provided a synopsis of the patient's medication on discharge.

4 There was a lack of interoperability (the capacity to exchange, interpret and store data to common standards) between primary and secondary care electronic prescribing systems, between secondary care facilities, between secondary and tertiary care, and between secondary care and community pharmacy.

5 Within primary care, guidance on the design and implementation of electronic prescribing systems in respect of alerts (warnings) is variable.

6 There are many different types of ePMA system available in England – some bespoke, others commercial off-the-shelf systems – and they are provided by several different vendors.

7 There are opportunities for technological intervention specifically aimed at ePMA system improvements, as the roll-out in hospitals across England has been gradual.

8 The implementation of electronic prescribing is associated with a greater than 50% reduction in medication errors and possibly a similar reduction in patient adverse drug events.

9 There is limited knowledge and data relating to unintended consequences of introducing ePMA systems because of the varied nature of health IT products and the lack of common criteria against which to measure the impact.

10 Commercial ePMA systems reduced medication errors if the available functionality was switched on, used appropriately, integrated with other relevant IT systems and aligned with clinical workflows.

11 In the reference event, the medicines reconciliation process in primary care would have provided an opportunity to detect the continuation of the dalteparin after discharge from hospital.

12 Standardisation of clinical decision support (CDS) systems could benefit the prescriber in relation to drug–drug interaction alerting.

13 There are software design standards, including those for CDS systems, which are mandatory for all software suppliers.

14 Minimum rules would guarantee data interoperability and enable national open standards to be set for data and interoperability.

15 Transfer of care initiatives improve communication between care settings, addressing the issue of referral rejection.

16 There is no standard discharge process built into ePMA systems to facilitate safe discharge.

17 Hospital ward pharmacy provision is not always available seven days a week to ensure there is: adequate checking for errors in prescribing; minimal transcription from paper systems into the ePMA by entering directly on to the system; and medicines reconciliation in accordance with national guidance.

HSIB MAKES THE FOLLOWING SAFETY RECOMMENDATIONS

Safety recommendation R/2019/050:
It is recommended that NHSX develops a process to recognise and act on digital issues reported from the Patient Safety Incident Management System.

Safety recommendation R/2019/051:
It is recommended that NHSX supports the development of interoperability standards for medication messaging.

Safety recommendation R/2019/052:
It is recommended that NHSX continues its assessment of the ePRaSE pilot and considers making ePRaSE a mandatory annual reporting requirement for the assessment and assurance of electronic prescribing and medicines administration safety.

Safety recommendation R/2019/053:
It is recommended that the Department of Health and Social Care should consider how to prioritise the commissioning of research on human factors and clinical decision support systems; particularly in relation to the configuration of software system alerting and alert fatigue, to establish how best to maximise clinician response to high risk medication alerts.

Safety recommendation R/2019/054:
It is recommended that NHS England and NHS Improvement include in the Medication Safety Programme shared decision making and improved patient access to medication information across all sectors of care, to ensure a person-centred approach to safe and effective medicines use.

Safety recommendation R/2019/055:
It is recommended that NHSX produces guidance for configuring the electronic discharge process, and how electronic prescribing and medicines administration systems should be interfaced with such a process.

HSIB MAKES THE FOLLOWING SAFETY OBSERVATIONS

Safety observation O/2019/039:
The use of paper and electronic systems in parallel should be minimised to reduce the risk of error caused by multiple data entry/retrieval sources.

Safety observation O/2019/040:
The practice of documenting only newly prescribed medication on discharge summaries should be reviewed from a patient safety and medicines management perspective.

Safety observation O/2019/041:
Counselling of patients newly commenced on a direct oral anticoagulant is critical to the safe use of these medicines. It would be helpful if NHS trusts reviewed this practice paying particular consideration to the communication of changes in medication and the initiation of new medication

Safety observation O/2019/042:
There may be benefit for healthcare professionals to receive training in handover communications which should include integrating clinical information with full medicines information, and to share this information with patients and carers in writing and verbally.

Safety observation O/2019/043:
During the implementation of any new digital system, benefits may be realised by redesigning work practices to ensure the new system is fully embedded, with staff training/engagement to support this.

Safety observation O/2019/044:
It would be beneficial to the users of electronic prescribing and medicines administration systems if the system vendors raised awareness of the safety limitations of their products and had a system for collating safety feedback to inform future development and a mechanism for sharing feedback with other users.

Safety observation O/2019/045:
The processes for medicines reconciliation in the community would benefit from being reviewed, taking into account the intent for practice-based pharmacists outlined in NHS England's Long Term Plan (NHS England, 2019).

Safety observation O/2019/046:
National, peer-reviewed, standardised lists of alerts for clinical decision support systems should be the gold standard, to enable consistency of approach and to promote evidence-based safety improvements.

Safety observation O/2019/047:
In acute trusts where digital systems are in place, the prioritisation of medicines reconciliation and medication reviews supports the consistent delivery of these core functions, across seven-day services.

HSIB NOTES THE FOLLOWING SAFETY ACTION HAS BEEN IMPLEMENTED

Safety action A/2019/017:
The National Academic Health Science Networks Medicines Optimisation Network has been commissioned by NHS England to support the roll-out of Transfers of Care Around Medicines across England.

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FURTHER INFORMATION

More information about HSIB – including its team, investigations and history – is available at **www.hsib.org.uk**

If you would like to request an investigation then please read our **guidance** before submitting a safety awareness form.

@hsib_org is our Twitter handle. We use this feed to raise awareness of our work and to direct followers to our publications, news and events.

CONTACT US

If you would like a response to a query or concern please contact us via email using **enquiries@hsib.org.uk**

We monitor this inbox during normal office hours - Monday to Fridays (not bank holidays) from 0900hrs to 1700hrs. We aim to respond to enquiries within five working days.

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