



Health Services Safety
Investigations Body

Investigation report

Medication not given: administration of time critical medication in the emergency department

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Medication, Communication and decision making, Continuity of care

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A note of acknowledgement

We would like to thank the family of the patient whose experience is documented in this report. We would also like to thank the healthcare staff who engaged with the investigation for their openness and willingness to support improvements in this area of care.

About this report

This report is intended for NHS organisations, patient safety leads, healthcare staff, and patients and their families and carers, to help improve patient safety in relation to time critical medications being provided in emergency department (ED) settings. For readers less familiar with this area of healthcare, medical terms are explained in section 1.

The report presents findings from a patient safety event and identifies factors relevant to learning in other NHS organisations. It is intended to support local improvements in patient safety in relation to time critical medications in EDs. It also identifies learning in relation to electronic prescribing and medicines administration (ePMA) systems. This learning, alongside learning from previous HSSIB investigations, will be used to inform a future national investigation into the safe use of ePMA systems in acute hospitals.

Terms used in the report

Although some organisations use the term 'Parkinson's disease', this report will refer to it as 'Parkinson's'. This is in line with guidance from Parkinson's UK that suggests people with Parkinson's feel the word 'disease' sounds negative, or like an infectious illness.

In September 2024, the Department of Health and Social Care and the British Medical Association agreed to change the title of 'junior doctor' to 'resident doctor'. To reflect this change, the term 'resident doctor' is used in this report.

Executive summary

Background

This is the first in a series of investigations exploring why medications intended to be provided to patients are not given. Patients who need medications can suffer harm if these are not provided.

The investigation explored the systems and processes in place to support staff to recognise, prescribe and administer time critical medications in the emergency department (ED). Time critical medications are medications that must be given at specific times of the day to ensure they are fully effective. The investigation also explored the role played by electronic prescribing and medicines administration (ePMA) systems in supporting care in this area.

To explore these issues, the investigation used a patient safety event involving a patient aged 85 with Parkinson's. The patient usually took his own medication (self-administered) at home – two doses of Parkinson's medication four times a day, at set times – to help control his symptoms.

The patient safety event

The patient had attended hospital for an outpatient appointment where he mentioned he had back pain following a fall at home the previous day. He was advised to attend the ED and went there immediately after his outpatient appointment.

The patient spent 3 days in the ED. During this time he should have received a total of 18 doses of his Parkinson's medication, which was a time critical medication. However, seven doses were not given and three doses were given late. This meant that only 8 of 18 doses of Parkinson's medication were provided to the patient on time.

The patient was transferred to a medical ward where his Parkinson's symptoms deteriorated and he lost the ability to swallow. The patient died 4 weeks after his admission to the ward. The causes of death identified on his death certificate included bronchopneumonia (severe chest infection), Parkinson's, and frailty of old age.

The investigation

This series of investigations will explore patient safety events that took place in NHS organisations to understand the local factors that may impact on patients not receiving medications as planned.

HSSIB spoke with a number of national stakeholders who told the investigation that there would be value in understanding more about how situations occur where patients are not given their usual medication when in the ED. The investigation shares findings from the patient safety event and highlights opportunities for local level learning in NHS EDs and across healthcare more widely to help improve patient safety in this area.

Findings

- The patient required time critical medication for Parkinson's but did not receive, or received late, 10 of 18 doses during his time in the ED. The coroner reported Parkinson's as a factor leading to the patient's death.
- There were no defined roles or responsibilities in the ED to ensure patients who required time critical medications were identified, and medications prescribed, as soon as possible.
- The ED had no dedicated pharmacy support to help staff in providing care to patients who required time critical medications.
- The patient spent 52 hours in the ED; for 44 of these he was cared for in a corridor because of demand on ED services. Corridor care created additional challenges for ED staff and specialty teams and may have limited opportunities to store the patient's medication which he had brought from home.
- The Trust did not participate in the Royal College of Emergency Medicine Quality Improvement Programme on time critical medication.
- The ePMA system did not include a function to alert staff about patients who required time critical medications to be prescribed or administered.
- An outage in the ePMA system meant the patient required both an electronic and paper prescription chart. This may have caused additional confusion about the patient's medication.
- Staff had adapted their practice to ensure they could effectively use the ePMA in the ED setting. This was because of challenges in accessing computers and medication rooms in the ED environment.
- The patient self-administered some doses of his Parkinson's medication, but this was not planned and self-administration by patients was not widely supported by clinical staff or local guidance.
- Staff were not able to check neurology clinic letters because there was a backlog in these letters being uploaded to the electronic patient record system.
- Staff were not able to check information with the patient's GP practice or Parkinson's specialty team at the time the patient's medication was prescribed in the ED, as this was outside of these services' working hours.

- Staff received contradictory information from the patient's son and the GP summary care record about the dosage of medication the patient required. The GP summary care record was taken as the most accurate record, but the information it contained was incorrect.
- Once the patient's medication information was entered onto the ePMA system, no further attempt was made to contact the GP practice or Parkinson's specialty team to confirm it was correct.
- Some information about the patient's medication within the GP patient record was transferred to the GP summary care record, but other information was not.

HSSIB makes the following safety observation

Safety observation O/2024/052:

NHS trusts can improve patient safety by using the information contained in the information pack for the Royal College of Emergency Medicine's Quality Improvement Programme on time critical medications to assess their preparedness and make local improvements in identifying, prescribing, and administering time critical medications in emergency departments.

Local-level learning prompts for acute hospitals

HSSIB investigations include local-level learning where this may help organisations and staff identify and think about how to respond to specific patient safety concerns at the local level.

The following prompts are provided by HSSIB in addition to those contained in the Royal College of Emergency Medicine's Quality Improvement Programme on time critical medication to help acute hospitals to improve safety for patients receiving time critical medications in the ED. These prompts may also be useful for other hospital departments who receive patients into their care.

Delays in identifying and prescribing time critical medication in the ED

- How does your organisation ensure that patients who need time critical medications are identified as soon as possible on arrival to the ED?
- Who in your patient pathway is responsible for identifying patients who need time critical medications?
- Who in your patient pathway is responsible for prescribing time critical medications?

- How does your organisation ensure that once a patient's need for time critical medications is identified, they are prescribed?
- What aids or tools are available in your organisation to help staff to identify patients who need time critical medications?
- What pharmacy support is available to staff in ED to support in the care of patients who need time critical medications?

Missed and delayed doses of time critical medication in the ED

- How does your organisation support staff to access information (including information from primary care and specialty teams) about patients' time critical medications?
- How does your organisation support patients to self-administer time critical medications, when appropriate?
- How does your organisation capture information when patients self-administer time critical medications?
- How does your organisation receive and consider information from families and carers to help avoid missed or delayed doses of time critical medications?

ePMA systems and time critical medication in the ED

- How does your ePMA system help to alert staff to patients who need time critical medications?
- How does your organisation train staff to use local ePMA systems and record when patients require time critical medications?
- How does your organisation prepare and support staff to work safely when ePMA systems may not be functioning to ensure time critical medications are not missed?
- How does your organisation audit delays or omissions in time critical medications and use this to improve delivery of time critical medication?
- Is your organisation aware of any adaptations that staff are required to make to ensure they can use the ePMA system effectively in local environments?

1. Background and context

1.1 Introduction

1.1.1 This investigation focuses on the systems and processes in place to support staff in recognising, prescribing and administering time critical medications in the emergency department (ED). It also explores the role of electronic prescribing and medicines administration (ePMA) systems in supporting or hindering care in this area.

1.2 Time critical medication

1.2.1 The Institute for Safe Medication Practices in the USA defines time critical medications as 'those where early or delayed administration of maintenance doses of greater than 30 minutes before or after the scheduled dose may cause harm or result in substantial sub-optimal therapy' (Institute for Safe Medication Practices, 2011). The term 'maintenance dose' refers to the amount of a medication needed to maintain a steady state in the body.

1.2.2 In England, a nationally agreed list of time critical medication is not in place; instead, organisations define these themselves. In 2010, the National Patient Safety Agency – the predecessor of the NHS England national patient safety team – issued a patient safety alert, 'Reducing harm from omitted and delayed medicines in hospital' (National Patient Safety Agency, 2010). This outlined how organisations were to ensure medications were correctly administered without delay. The alert stated that medication for Parkinson's should be included in the list of critical medications where timeliness of administration is crucial. The Healthcare Safety Investigation Branch (HSIB) has previously considered the complexity in defining high-risk (including time critical) medications ([Healthcare Safety Investigation Branch, 2020](#)).

1.2.3 This initiative created a national impetus and healthcare organisations were required to have local guidance on this safety issue. A review of previously issued safety guidance stated that consideration needed to be wider than just the 'medication type, including consideration of 'higher risk patients'... and 'higher risk situations' (NHS England, n.d.a).

1.2.4 The Royal College of Emergency Medicine (RCEM) has defined six types of time critical medications using the acronym MISSED:

- 'Movement disorders – Parkinson's/Myasthenia
- Immunomodulators – including HIV medication
- Sugar – diabetes medication (insulin)
- Steroids – Addison's and adrenal insufficiency
- Epilepsy – anticonvulsants

- Direct oral anticoagulants (DOAC) and warfarin'. (Royal College of Emergency Medicine, 2023a)

1.2.5 However, the RCEM list is not exhaustive. Other national bodies and local organisations also include the following medications as time critical (Care Quality Commission, 2023; East Midlands Emergency Medicine Educational Media, 2024):

- antibiotics
- pain management medications, including opioids
- resuscitation medication.

1.2.6 In the patient safety event described in this report, the Trust included a list of critical medications, which should not be delayed or omitted. The list was:

- antimicrobials (antibiotics, antivirals, antifungals)
- anticoagulants
- antiepileptics
- cardiac medication
- corticosteroids
- clozapine
- desmopressin
- diabetic medication (oral agents and insulin)
- intravenous fluids
- immunosuppressants post-transplant
- opioid analgesics
- Parkinson's medication.

1.2.7 The NHS Specialist Pharmacy Service (SPS) launched a national scoping review on the use of time critical medications in October 2024 with an aim to collect examples of 'what has worked well and what has not worked so well' within NHS organisations in how they manage time critical medications, with the intention of creating a future national medicines safety improvement programme (NHS Specialist Pharmacy Service, 2024). NHS SPS also has other resources available via its website to support in the understanding of time critical medications and the challenges that these medications can pose to patient safety (NHS Specialist Pharmacy Service, 2023).

1.3 Parkinson's

1.3.1 Parkinson's is a condition which affects parts of the brain. It is a progressive condition which means people will experience worsening symptoms over time. Parkinson's affects a person's levels of dopamine, a chemical which sends messages to the brain to inform muscles when to move. These messages go down to the muscles via the nervous system. When a person has Parkinson's the amount of dopamine in the brain reduces which makes it more difficult for the messages to get to the muscles. The main symptoms of Parkinson's are:

- Tremors – where the body uncontrollably shakes, these tremors can be small and affect fine motor function, for example in the fingers which makes holding objects difficult, or can affect gross motor function, for example tremors in the legs which make walking difficult.
- Slow movement.
- Stiff and inflexible muscles – this can lead to problems with movement, including the ability to speak and swallow. (NHS, 2022)

1.3.2 Parkinson's affects more men than women. Approximately 153,000 people in the UK have Parkinson's and worldwide it is the fastest growing neurological condition in terms of prevalence. Parkinson's UK states that there is limited research into aspects of race/ethnicity and Parkinson's. It is thought that white males are likely to be more affected. Also, people from 'Black or Caribbean backgrounds are more likely to be affected by slowness of movement, thinking and memory problems and dementia than other ethnic groups. People from Asian backgrounds seem more likely to freeze and experience uncontrolled movements (dyskinesia)' (Parkinson's UK, 2020).

1.3.3 The symptoms of Parkinson's can be controlled with different types of medication. Prior to attending the ED the patient in this investigation was taking a Parkinson's medication containing levodopa and benserazide called co-beneldopa. Parkinson's medication often needs to be taken several times a day, and the timing of the medication is important. A delay of more than 30 minutes in taking any medication containing levodopa can lead to a deterioration in symptoms, and in serious cases, neuroleptic malignant syndrome, which is a life-threatening condition (Parkinson's UK, n.d., National Institute for Health and Care Excellence, 2018).

1.3.4 Parkinson's UK has produced recommendations for NHS organisations to support timely, safe and appropriate medicine management for people with Parkinson's (Parkinson's UK, 2024). This includes considerations for EDs.

1.4 Attendance at an emergency department

1.4.1 In 2023, HSIB published a report titled '[Harm caused by delays in transferring patients to the right place of care](#)'. The investigation highlighted that patients requiring admission to hospital experienced long wait times in EDs and that the ED was used as an overflow ward as a result of delayed discharges from the hospital into social care (Healthcare Safety Investigation Branch, 2023). Patients over the age of 65 years are also more likely to be affected by prolonged waits for admission in EDs than younger patients (Independent Investigation of the NHS in England, 2024).

1.4.2 People with Parkinson's may attend an ED, either for reasons related to Parkinson's or for other reasons not related to Parkinson's. Attendance at an ED at any time risks overlapping with the time a person is due to take their Parkinson's medication.

1.4.3 The ED is responsible for managing a patient's immediate complaint, but also needs to ensure their continued safety by ensuring that all time critical medications are reviewed and where appropriate prescribed and administered in a timely manner.

1.4.4 RCEM have produced a 'safety flash' about time critical medications in ED (Royal College of Emergency Medicine, 2023c). This suggests:

- EDs should display a poster at reception or triage that empowers patients to inform staff if they take any time critical medications.
- Hospitals should ensure minimal delays between ED referral and specialty review. Time critical medications should be prescribed for patients at least up to the time of referral for speciality admission.
- There should be an ED pharmacy service that is responsible for managing medication availability and governance.

1.4.5 RCEM have produced a position statement about the clinical responsibility for patients within the ED when patients physically remain in the ED but have been referred to a specialty team (Royal College of Emergency Medicine, 2023b).

1.4.6 Although this report focuses on a patient with Parkinson's, the learning may be relevant for any medical condition that requires time critical medication.

1.5 Electronic prescribing and medicines administration systems

1.5.1 An electronic prescribing and medicines administration (ePMA) system is defined as follows:

'The utilisation of electronic systems to facilitate and enhance the communication of a prescription or medicine order, aiding the choice, administration and supply of a medicine through knowledge and decision support and providing a robust audit trail for the entire medicines use process.' (NHS Connecting for Health, 2009)

1.5.2 In practical terms, an ePMA system in a hospital supports the safe, effective, and cost-effective use of medicines from a patient's arrival at hospital until their discharge. ePMA systems may exist as standalone systems or systems that may integrate with an organisation's wider electronic patient record systems. Neither of these electronic systems include the dispensing of medications from the hospital pharmacy.

1.5.3 HSIB has previously investigated the role of [electronic prescribing and medicines administration systems and safe discharge](#) (Healthcare Safety Investigation Branch, 2019).

1.6 GP summary care record

1.6.1 The GP summary care record is a shared record that is available to all healthcare organisations. Information from certain fields in the GP's electronic patient record is sent to a national database. Details of medications prescribed are included in the national database, alongside the patient's identifying information. Other information is also included that is not relevant to this investigation. Specific details relating to GP consultations, notes, letters and test results are not included in the national database and this information is only available via the GP.

1.7 The RCEM Quality Improvement Programme

1.7.1 In autumn 2023 the RCEM began a Quality Improvement Programme (QIP) focusing on time critical medications, in particular levodopa (a medication used to manage Parkinsons). The programme will run until 2026, focusing on different types of time critical medication each year (Royal College of Emergency Medicine, 2023d).

1.7.2 Participation in the QIP is voluntary. Organisations were invited to submit their data and use the information to make changes to their local practice. In addition, the data platform allowed organisations to compare themselves against the national mean. At the time of writing this report, the QIP was still in its first year.

1.7.3 The QIP sets out a process map for organisations for time critical medications. It also sets out standards, process measures and outcome measures that organisations can assess themselves against. The supporting organisational checklist allows organisations to benchmark their preparedness for time critical medications in the ED.

2. The patient safety event

The investigation used the following patient safety event to explore the patient safety risks posed by missed or delayed time critical medications in emergency departments (EDs).

The patient was a man aged 85 years who had Parkinson's. He self-administered his medication at home and regularly took two doses (12.5/50 mg and 50/200 mg) of co-beneldopa four times a day at 08:00, 12:00, 16:00 and 20:00 hours. If this medication is taken outside of these times it risks reducing its effectiveness.

The patient had gone to hospital for an outpatient appointment where he mentioned that he had back pain following a fall at home the day before. He was advised to attend the ED.

Day 1

2.1 Accompanied by his son, the patient arrived at the ED at 16:47 hours and was seen by the triage nurse at 17:53 hours to help establish what type of care he needed. The triage nurse recorded the patient's observations and noted his past medical history, including his diagnosis of Parkinson's. The patient self-administered his 20:00 hours doses of co-beneldopa from his own supply while waiting to be seen by a doctor.

Day 2

2.2 The patient was seen by a resident doctor at 01:06 hours who requested an X-ray of the patient's back. The plan was to send the patient home providing there was no fracture in his spine. The X-ray was undertaken shortly after and the resident doctor sought advice from a more senior colleague who reviewed the X-ray. The X-ray result was not clear and the senior colleague suggested a computed tomography (CT) scan of the patient's lumbar spine area (lower back). The resident doctor then made the request.

2.3 The patient remained in the ED waiting area until around 03:00 hours, when he was moved into a bed in the corridor because of bed pressures in the ED. The patient remained in a bed in the ED corridor for the rest of his time in ED, a further 44 hours.

2.4 The nurse caring for the patient documented in the patient's electronic medical record that he had self-administered his own medication at around 08:00 hours. At 11:04 hours, staff noted that the CT scan showed 'no acute fracture' to the patient's spine. At 14:09 hours, the patient was prescribed pain relief. At this point, it was not clear whether the patient would be going home or would need to be admitted to hospital.

2.5 That evening, the patient was seen by a resident doctor from the medical team. At this point, the resident doctor prescribed the patient's regular medication, including co-beneldopa, on a paper prescription chart. The Trust had an electronic prescribing and medicines administration (ePMA) system but this was not functioning at this time due to an unplanned outage.

2.6 Based on information in the patient's GP summary care record, the patient was prescribed co-beneldopa 12/50 mg four times a day and co-beneldopa 50/200 mg three times a day. This meant the patient was receiving one less dose of his 50/200 mg than he had been taking before his arrival in the ED.

2.7 The nurse gave both doses of co-beneldopa, due at 20:00 hours, at 21:30 hours that night. The patient remained in the ED and there was a request to radiology to re-review the X-ray from the previous night. An addendum was made to the report which indicated the patient had a bowel obstruction (a blockage in his intestines that would have prevented food and liquid from passing through) and the patient was referred for a surgical opinion. A member of the surgical team reviewed the patient but did not identify that any surgical intervention was required and advised that the obstruction could be managed with laxatives. The patient remained under the care of the medical team with a suspect chest infection.

Day 3

2.8 At 09:00 hours, the nurse administered the 12.5/50 mg dose of beneldopa which was prescribed to the patient for 08:00 hours. The patient was seen by another resident doctor from the medical team just after midday who then prescribed co-beneldopa on the hospital's ePMA system. The patient received their 16:00 hours and 20:00 hours doses of co-beneldopa at both strengths before being moved to a medical ward for further treatment.

2.9 After the patient was moved to the medical ward his Parkinson's symptoms deteriorated and he lost the ability to swallow. He required a nasogastric tube (a tube that goes through a patient's nose and into their stomach) for feeding and the administration of his medication. Four weeks after his admission to the ward, the patient died. The death certificate stated that causes of his death were: 1a bronchopneumonia (severe chest infection), 1b Parkinson's, and 2 frailty of old age.

2.10 A review of the patient's medical records showed that during his time in the ED he should have received 18 doses of co-beneldopa. He self-administered three doses. However, the records showed that he then did not receive his required medication on seven occasions and received his medication late on a further three occasions. This meant that potentially only 8 of the patient's 18 doses of time critical medication were provided to him, or provided on time.

3. Analysis and findings

The investigation explored the factors that may have led to the patient missing doses of his Parkinson's medication to understand the challenges faced in emergency departments (EDs), and by healthcare staff, in ensuring time critical medications are provided in a timely manner. This included consideration of the Trust's electronic prescribing and medicines administration (ePMA) system.

The section includes local learning prompts, to be used alongside or 'in addition to' those contained in the Royal College of Emergency Medicine Quality Improvement Programme on time critical medications. The aim of the prompts is to help acute hospitals to improve the safety of patients receiving time critical medications in the ED.

3.1 Medications that the patient received and medications that were not given

3.1.1 The patient spent a total of 52 hours in the ED. During this time he was due to receive 18 doses of co-beneldopa. A dose refers to each capsule to be taken, for example at 20:00 hours two doses are due. Table 1 sets out if and how these doses were provided.

Table 1 Recorded doses of the patient's Parkinson's medication

Day 1

Co-beneldopa medication	Time due (hours)	Time taken (hours)	Where and how medication was prescribed
12.5/50 mg	20:00	20:00 Self-administered – as reported by the patient's son	Not prescribed
50/200 mg	20:00	20:00 Self-administered – as reported by the patient's son	Not prescribed

Day 2

Co-beneldopa medication	Time due (hours)	Time taken (hours)	Where and how medication was prescribed
12.5/50 mg	08:00		

Co-beneldopa medication	Time due (hours)	Time taken (hours)	Where and how medication was prescribed
		08:00 Self-administered	Not prescribed, nurse documented on electronic patient record (EPR)
	12:00	Not recorded	Not prescribed
	16:00	Not recorded	Not prescribed
	20:00	21:30	Paper prescription chart
50/200 mg	08:00	08:00 Self-administered	Not prescribed, nurse documented on EPR
	12:00	Not recorded	Not prescribed
	16:00	Not recorded	Not prescribed
	20:00	21:30	Paper prescription chart

Day 3

Co-beneldopa medication	Time due (hours)	Time taken (hours)	Where and how medication was prescribed
12.5/50 mg	08:00	09:00	Paper prescription chart
	12:00	Not recorded	Not prescribed
	16:00	16:00 Electronic signature	ePMA
	20:00	20:00 Electronic signature	ePMA
50/200 mg	08:00	Not prescribed	Not prescribed
	12:00	Not recorded	Not prescribed
	16:00	16:00 Electronic signature	ePMA
	20:00	20:00 Electronic signature	ePMA

3.1.2 In summary, the patient did not receive their medication in three different ways:

- The first eight doses were not prescribed during the patient's first 24 hours in the ED. The patient self-administered the first four doses.
- When the medication was prescribed, the morning dose was incorrect.

- A dose was prescribed but not given on day 3.

3.1.3 The investigation explored the factors that impacted on these issues, including roles and responsibilities in the ED, and where information about a patient's time critical medication was documented. The analysis below considers:

- delays in identifying and prescribing time critical medication (section 3.2)
- missed and delayed doses of time critical medication (section 3.3)
- ePMA systems and time critical medication (section 3.4).

3.2 Delays in identifying and prescribing time critical medication in the ED

Roles and responsibilities in the ED

3.2.1 The investigation heard that the focus of the ED was to assess patients and decide whether they could be treated immediately and discharged home or would require admission to hospital.

3.2.2 The patient was seen by several staff members when he attended the ED. The investigation found these staff each had a different role within the ED. However, importantly, there was a lack of clarity about which staff may be responsible for identifying that patients needed time critical medication and which staff were then required to act on this information. The roles and responsibilities for time critical medication are described in table 2.

Table 2 ED roles and responsibilities

Staff member	Role	Opportunity to identify/initiate time critical medication
Emergency nurse practitioner	To identify whether the patient should be seen in the ED or elsewhere (for example, an urgent treatment centre or other service).	Would have knowledge to understand time critical medication but no capacity to act on time critical medication information as it would take them away from their core role and patients would go directly to the ED reception, which may increase ED attendances.
Receptionist	To book the patient into the ED system so they can be seen.	Does not have clinical training to understand which medications may be time critical.
Triage nurse	To identify the priority for the patient to be seen. To create an identity band and place	Has the knowledge to identify time critical medication and high-risk

Staff member	Role	Opportunity to identify/initiate time critical medication
	this on the patient. To ask questions about the patient's presenting complaint (the health problem that is their main reason for visiting the ED) and identify past medical history and medication. To request blood tests or an electrocardiogram (ECG) if deemed appropriate.	patients. There is an opportunity to ask and document information regarding time critical medication but this is not the primary purpose of triage. There is a risk that acting on getting time critical medication prescribed may delay other patients being triaged.
ED nursing staff	To take bloods and/or complete an ECG if requested at triage.	Does not assess the patient so there is limited opportunity to identify time critical medication.
ED assessment – resident doctor (formerly junior doctor)	To assess the patient's presenting complaint and identify whether any tests, treatment or referrals are needed. Make an initial plan for the patient. Prescribe time critical medication/regular medications.	The first clinician with knowledge and skills to identify and prescribe time critical medication. The patient had been waiting for 8 hours and already missed/self-administered evening dose.
ED registrar	To assess the patient's current status, review any tests and to see if the current plan is still appropriate. Add to the plan if necessary. To check/review medications prescribed.	Has skills, knowledge and experience to identify and prescribe time critical medication. However, the time from admission to being seen by a registrar can be over 12 hours. In this case this patient was not seen in person by the ED registrar.
Specialty referral	To assess the patient and identify whether they will be accepted by the specialty for further treatment and admission. If to be accepted, the patient becomes the responsibility of the specialty. Take a detailed medical history including medication history and prescribe all regular medications.	Some ED staff told the investigation that identifying and prescribing time critical medication is the responsibility of the specialty team following a decision to admit. In this case this was more than 24 hours after arriving in the ED and eight doses were already missed.
Different specialty opinion(s)	To provide advice on an element of the patient's condition they have been asked to review. When providing an opinion they are not assessing the patient's health overall or considering their medication needs.	In this case a surgical opinion was sought for the patient's potential bowel obstruction. The purpose is to provide opinion; they do not consider prescribing any medication unless it relates to the opinion sought.

Staff member	Role	Opportunity to identify/initiate time critical medication
ED consultant review	To provide senior expert advice and oversee the patient's management plan. May not see the patient in person.	This is an opportunity to check that medications, including time critical medications, have already been prescribed. However, there may be a significant time delay between a patient's arriving at the ED and being reviewed by a consultant. The investigation was unable to determine when this occurred for the patient.
ED nurse	To provide care to the patient in a 1:4 staff to patient ratio (1:5 when busy) including nursing care and assessments, falls and bed rail assessments, assessment of skin integrity, preparation for transfer/discharge and administration of all prescribed medications.	Has the knowledge to identify time critical medications and could follow up with a doctor to ensure time critical medications are prescribed if they are aware they are due and not prescribed. Responsible for administering time critical medications once prescribed.

3.2.3 ED staff sought support from the Trust pharmacy team on an as-needed basis. In practice this meant there was no dedicated pharmacist to support prescribing or medicines reconciliation. Medicines reconciliation is the process of creating the most accurate list possible of all the medications a patient is taking (Lester et al, 2019). This process results in a complete list of medicines that can be accurately communicated. The Healthcare Safety Investigation Branch (HSIB) has previously investigated [the role of clinical pharmacy services on inpatient wards](#) (Healthcare Safety Investigation Branch, 2020).

3.2.4 Staff told the investigation that there had previously been a dedicated ED pharmacist and they had felt supported with medications and prescribing. The funding for this post was temporary and when the funding was no longer available the post was made redundant. The Royal College of Emergency Medicine (RCEM) have worked with the UK Clinical Pharmacy Association to produce a joint position statement on the use of pharmacy services in emergency departments. This highlights the value of such services in helping to focus on time critical medications (Royal College of Emergency Medicine, 2023e) Dedicated ED pharmacy provision is also highlighted by Parkinson's UK to support the management of time critical medications (Parkinson's UK, 2024).

3.2.5 Staff highlighted that the change in the nature of ED care due to longer length of stay meant that an ED-based pharmacy service was needed to support the ongoing care of ED patients. Staff felt that earlier medicines reconciliation from a dedicated member of staff might support identification of time critical medications.

3.2.6 In the patient safety event, the patient's son came to the ED with the patient and stayed with him until he was settled into a bed. The patient's son helped him to take his evening doses of co-beneldopa in the waiting area. The son also helped him to take his morning doses while he was on the corridor bed and the nurse documented this in the EPR. Although the son prompted the patient to take their co-beneldopa and told the nurse the patient had taken it, co-beneldopa was not prescribed until later that evening when the patient was seen by the medical doctor. The investigation was not able to identify why the patient's co-beneldopa was not followed up through to prescription and administration until that evening, resulting in four missed doses that day.

3.2.7 The RCEM Quality Improvement Programme (QIP) (see 1.2.4) suggests there is a poster behind the receptionist to act as a prompt for patients to tell staff about time critical medications. The hospital was not participating in the QIP; however, the lead consultant was aware that it was ongoing. The investigation observed the receptionist's practice at the hospital where the patient safety event occurred; their focus was on obtaining correct patient details and verifying these with the national database and making a record of 'reason for attendance'. There was no poster in the reception area to act as a prompt for patients.

3.2.8 Although not a factor in this specific patient safety event, pharmacy staff told the investigation that they had now begun to explore with the local ambulance service how time critical medications could be identified by ambulance crews when patients were transported to hospital. RCEM also shared feedback about the important role that ambulance services may have in identifying patients who are taking time critical medications when they arrive in ED.

Focus on discharge and decision to admit

3.2.9 The ED resident doctor who saw the patient at 01:06 hours on day 2 told the investigation that on reviewing the patient's records they recalled the patient was keen to go home, that if admitted he would be spending time on a bed in the corridor and that patients with Parkinson's "tend to do better at home". With that in mind, the resident doctor stated that they were working to send the patient home and therefore did not consider prescribing the patient's regular medication as he would be home before his morning dose was due. The request for a CT scan delayed being able to send the patient home. The focus on sending the patient home hindered the prescribing of the patient's time critical medications by the first person with the knowledge and skills to undertake this task.

3.2.10 The investigation heard from several members of staff that older patients, and particularly those with Parkinson's, 'do better at home'. In this case, the patient attended the ED because of back pain following a fall at home. The patient had frequent falls at home due to the nature of his Parkinson's. All scans showed the patient did not have a fracture following this fall. However, an unexpected finding was the chest infection for which he was admitted under the medical team. The presence of infection can cause a person's risk of having a fall to increase, particularly among older people.

3.2.11 On review, the initial assessment was to send the patient home if he did not have a fracture. This mental model did not allow for consideration of admission and the need to ensure continuity of the patient's time critical Parkinson's medication. Over time, the patient was not deemed fit for discharge and required medical intervention; however, the patient had already missed four doses of his time critical Parkinson's medication by the time this decision was made. This does not include the four doses the patient self-administered.

3.2.12 The investigation heard differing opinions regarding when ED doctors would consider prescribing regular medications. Some opinions suggested the decision would not/should not be made until a decision to admit the patient had been made. In this patient's case, the decision to admit him did not happen until he had been in the ED for around 24 hours.

3.2.13 Other opinions suggested that time critical and regular medications should be prescribed as soon as the patient is seen by a doctor or even the triage nurse. Another suggestion was for time critical medication to be prescribed on an ad hoc basis when the patient required it, until a decision to admit had been made. The RCEM safety flash (RCEM, 2023c) suggests that time critical medicines should be prescribed for patients at least up to the time of referral for speciality admission.

3.2.14 During a 'learning huddle' that the investigation observed, an ED consultant questioned resident doctors about prescribing time critical medications and suggested that at least a 3-day supply should be prescribed. One resident doctor countered that they had been "told off" because they prescribed 3 days of antibiotics for a patient. Following a call from microbiology the patient had been identified as requiring different antibiotics, and the initial antibiotics prescribed were not stopped by the medical team. The resident doctor was told they should not have prescribed for such a duration and this affected their practice going forward.

3.2.15 The Trust had a policy on delayed and omitted medicines but this did not set out roles and responsibilities in relation to when and for what duration time critical medication should be prescribed and administered in the ED.

3.2.16 The Trust had identified Parkinson's medication as a critical medication and specified time bands within which medication should be given. These time bands were 2 to 3 hours in duration and apply to all medication given. The organisation's policy stated that a delayed

medication was one given between 2 and 6 hours after it was due. This does not align with the requirements of time critical medications (National Institute for Health and Care Excellence, 2018).

3.2.17 Overall, the investigation identified that there was no overarching policy, guidance or standard practice setting out who should identify when patients were receiving time critical medication or when time critical medication should be prescribed during a patient's ED attendance.

Staff and family views on potential improvements

3.2.18 Staff working in the ED had various ideas about what would help to ensure time critical medications were identified, prescribed and administered in the ED. Numerous staff discussed the idea of an identity band which identified that a patient was taking time critical medication. The identity band would be a visual cue to staff to prompt a conversation about when the patient's medication was due, and if necessary to then request prescribing or administration.

3.2.19 Staff said that a local trust had implemented something similar and felt it had had a positive impact. The investigation did not engage with the local trust to understand the impact of its wristband scheme. Staff were not aware of any evaluation work undertaken to demonstrate the effectiveness of the wristbands.

3.2.20 At the time of the report, the trust involved in the patient safety event had decided against implementing identity bands despite it being part of their local investigation action plan due to a lack of evidence showing that identity bands improve the prescribing of critical medications. NHS England has also issued patient safety alerts on the use of identify bands and the potential risks and benefits of such an approach (NHS England, n.d.b).

3.2.21 The Trust also had posters on the triage room door and large banners next to the streamer desk, in the waiting area and in the corridors. The posters and banners displayed many different pieces of information about being in the ED. One related to asking patients to tell a staff member if they were taking time critical medication. However, this was included among a range of other information and may not have been immediately apparent. This approach places the onus on the patient, family member or carer to inform staff of information rather than allowing staff to proactively facilitate identification of time critical medications.

3.2.22 During observations, the investigation did not see any patients or staff members referring to the posters when discussing medication. Staff told the investigation about the posters and banners, but they could not recall what information was contained in them. The patient's son did not mention the presence of the posters and banners to the investigation.

3.2.23 A consultant thought that a community campaign to ask patients to always bring medication from home with them to the ED would help expedite identification and prescribing of time critical medication. Some nursing and medical staff suggested that the triage nurse would be the ideal person to identify time critical medication and ensure this was followed up with a prescription from a doctor. In addition, through the QIP, the RCEM may suggest that the receptionist booking the patient in could be responsible for identifying a patient who needs time critical medications.

3.2.24 All staff recognised the need for change with a dedicated point in the patient journey where time critical medications would be identified in a timely way. However, some stakeholders told the investigation that having only one dedicated point was a potential 'single point of failure' and multiple points where time critical medications were identified or checked may be required.

3.2.25 The patient's family highlighted that some patients may not know their medications are time critical and so may not be best place to alert this to staff. The patient's family had shared with the Trust their view that there should be a process in place to ensure all patients on "critical medication" are highlighted as soon as they arrive in the ED. They suggested that patients could be highlighted on the EPR (for example, via colour coding) so it would be easy to see for the nurses looking after patients in ED. They also suggested highlighting this information in any 'reasonable adjustments' section of the patient's EPR if there is one available.

3.2.26 The Trust told the investigation that it remained proactive in addressing this issue and was exploring alternative solutions. In line with comments from the patient's family, this included planning a quality improvement project to help flag patients in ED who need prescriptions for critical medications in its EPR. The intention would be that a flag would be triggered on a patients registration at reception, aiming to enhance timely and accurate prescribing practices.

3.2.27 As stated previously, the Trust was not participating in the RCEM QIP for time critical medications. However, the investigation reviewed the documentation for the QIP. The standards, measures and organisational checklist can provide a guide for organisations to assess their preparedness and make improvements in relation to time critical medications in the ED.

Local-level learning prompts for acute hospitals

The following prompts are provided by HSSIB in addition to those contained in the Royal College of Emergency Medicine's Quality Improvement Programme on time critical medication to help acute hospitals to improve safety for patients receiving time critical medications in the ED. These prompts may also be useful for other hospital departments who receive patients into their care.

- How does your organisation ensure that patients who need time critical medications are identified as soon as possible on arrival to the ED?
- Who in your patient pathway is responsible for identifying patients who need time critical medications?
- Who in your patient pathway is responsible for prescribing time critical medications?
- How does your organisation ensure that once a patient's need for time critical medications is identified, they are prescribed?
- What pharmacy support is available to staff in ED to support in the care of patients who need time critical medications?
- What aids or tools are available in your organisation to help staff to identify patients who need time critical medications?

HSSIB makes the following safety observation

Safety observation O/2024/052:

NHS trusts can improve patient safety by using the information contained in the information pack for the Royal College of Emergency Medicine's Quality Improvement Programme on time critical medications to assess their preparedness and make local improvements in identifying, prescribing, and administering time critical medications in emergency departments.

3.3 Missed and delayed doses of time critical medication in the ED

Corridor care/temporary escalation spaces

3.3.1 At the time of the patient safety event, the Trust had been struggling to meet demand for beds for a number of months and routinely used ED corridors as bed spaces for patients who needed to be admitted to the hospital. The patient was placed on a corridor bed space and spent the duration of his ED stay there. The corridor bed spaces were staffed on a ratio of one

nurse to four patients. Staff recognised that patients received a sub-optimal experience when on a bed in the corridor. Due to the lack of privacy on the corridor, any assessments or interventions were undertaken in a designated bed space.

3.3.2 Nurses who spoke to the investigation explained that although they thought having patients on the corridor was unsafe, they did their utmost to ensure they received standard nursing care including regular medications. The nurses did not have access to a medication trolley and therefore it took them longer to give medications as they had to leave the area to obtain the medications required. Nurses told the investigation that frequently required medications were not readily available or accessible for various reasons, including the medication running out and not having yet been replaced, or the medication not being stocked in the ED. Therefore, they would have to source them away from the ward, leaving their patients.

3.3.3 In addition, because the patient was being cared for on a corridor it was more difficult for his medicine to be kept with him. The patient's son told the investigation that at some point during day 2, a doctor told him to take his father's medication home as it would be prescribed and given by the hospital. The investigation has not been able to clarify when this conversation took place or who it was with.

3.3.4 The problem of corridor care is not unique to the Trust. In June 2024 the Royal College of Nursing (2024) published a report into corridor care where one third of nurses stated they had cared for a patient in a corridor or temporary escalation space. NHS England (2024a) states that corridor care 'is not acceptable and should not be considered as standard'.

3.3.5 The investigation observed that the Trust involved in the patient safety event had accepted that corridor care occurred and had taken steps to make it as safe as possible in the circumstances. Although NHS England does not support the use of corridors and temporary bed spaces, it has recently acknowledged that current demand exceeds capacity, with the expectation being that demand will continue to increase and organisations need to build in more capacity to meet the demand (NHS England, 2024b).

Self-administration of medication

3.3.6 The patient had brought his medication from home with him to the ED. He had been self-administering throughout the day while attending an outpatient clinic appointment. He then proceeded to self-administer two doses while in the ED, with the support of his son. The nurse documented in a free-text field in the EPR that he had self-administered his morning dose, as it had not been prescribed on the ePMA system. The Trust's EPR system did not interact with its ePMA system and no information about self-administration was entered separately onto the ePMA system.

3.3.7 On speaking with members of the medical team the strong consensus was a preference for doctor prescribing and nurse administration of medication rather than patient self-administration of medication.

3.3.8 The hospital had a self-administration policy that had been approved in September 2021 but could not be implemented. A Trust representative told the investigation that the key issue was a lack of lockers and keys for patients to access their medication if it was left with them in the hospital. There were also the additional challenges posed by corridor care (see 3.3.3). At the time of the patient's ED attendance the policy was not in use.

3.3.9 One member of the medical team told the investigation they wanted to make sure they knew exactly what had been prescribed and taken for each patient and for this to be documented in the medication section of the electronic record. The ePMA system at the Trust was part of the EPR but fields were not replicated from one to the other. Patients were not able to access their medical records on the EPR and ePMA system to update whether or not they had taken their own medication.

3.3.10 The patient involved in the safety event was in a bed in the corridor. This meant there was no privacy, or secure storage for any of the patient's belongings, including any medication he had brought with him. The lack of space meant that it was not possible to provide a place for patients to keep their belongings safely and staff urged them to only keep essentials with them. The use of corridor bed spaces made the safe storage of patients' medication impossible.

3.3.11 One member of staff supported that if a patient was well enough to take their own medication, then as the expert in their own condition they should be empowered to continue to self-administer while in hospital. The paper medication chart that was in use for a short period during the patient's care had a designated section for self-administration.

3.3.12 At some point, the Trust considered self-administration of medication for patients as it was included on the paper prescription chart and there was a draft policy. In the patient's case, he was allowed to self-administer two doses. However, there was no process in place to support the decision making and documentation of self-administration. Once the patient's son was advised to take the medication home, self-administration was not possible for the patient.

3.3.13 One doctor reported that the patient was a 'poor historian' and they phoned the patient's son to obtain a medical history and information about current medications. This may have demonstrated that the patient was unwell as his Parkinson's specialist nurse had previously described the patient as being very involved in his own care and that he knew what worked well for him. The deterioration of the patient's health from his baseline, coupled with the general reluctance to allow patients to self-administer medication, likely meant that self-administration was not a consideration for the patient as he became more unwell.

Interface between GP and hospital IT systems

Neurology clinic

3.3.14 The patient was under the care of a specialist neurology team for his Parkinson's. The neurology team was employed by another NHS trust (Trust B) to provide care for patients from the ED Trust's catchment area (Trust A). As a result, all the patient's information, including medical records and clinic letters, was stored on Trust B's EPR system. This situation would be similar for patients who attend a tertiary (specialist) centre for care of specific medical conditions.

3.3.15 There had been a previous agreement for all clinic letters from neurology to be downloaded from Trust B's EPR system and uploaded to Trust A's system. The investigation was told that there were issues in maintaining this and as a result there was a known backlog. The investigation requested from Trust A the most recent neurology letter on its system relating to the patient's care. The letter was dated 13 months prior to the patient's attendance at the ED, demonstrating the scale of the backlog.

3.3.16 The patient was seen by the ED assessment resident doctor out of hours. This meant the doctor could not contact the neurology team directly when they were unable to access the patient's neurology letters in the EPR. During working hours (Monday to Friday, 09:00 to 17:00 hours), the neurology team are available and provide support to the ED when requested.

3.3.17 The investigation was told that both Trust A and Trust B used the same EPR and ePMA systems, but that they were configured differently. At Trust B the neurology team were able to receive an alert when a patient was admitted to the Trust and they were coded to have Parkinson's within its EPR. The neurology team at Trust A requested the same functionality and were told by the IT team that it was not possible.

3.3.18 All clinic letters are were sent to the patients' GPs, so there was a record of the patient's care within primary care and Trust B. However, no record of his care was available to Trust A.

Primary care

3.3.19 The patient's GP's computer system was a standalone system. Data from certain fields was transferred to the national patient record system (also referred to as the GP summary care record or the Spine). The hospital system was also a separate standalone system. The hospital system was in use in other trusts across the country and is a system which originated in the USA. Although a number of other local trusts use the same system, the version, configuration and settings are separate which means there is no interoperability.

3.3.20 The Trust was not able to access information in the GP system and is only able to obtain information that has been sent from key fields to the national system. The investigation observed that the limited sharing of information contributed to the under dosing of the patient's morning co-beneldopa. Key information relating to the dose was contained in a field that is not shared with the GP summary care record.

3.3.21 As explained above, the patient was seen out of hours when the GP surgery was closed and could not be contacted to confirm the patient's medication dose. The clinic letters which contained information relating to the patient's co-beneldopa were also not part of the GP summary care record. Therefore, the letters were only available to staff who work for the GP surgery or Trust B, where the letters originated.

3.3.22 The investigation was told, based on the information in the GP system, that co-beneldopa 50/200 mg was to be taken three times a day. The administrative note accompanying this entry stated 'will increase gradually each week till on 4 per day as per neurology letter'. The investigation was not able to identify a clinic letter with these instructions. The investigation reviewed a clinic letter from March 2019 which had similar instructions but for a different dose of co-beneldopa. It is possible this entry became attached to the 50/200 mg dose of co-beneldopa in error.

3.3.23 The process at the patient's GP surgery (and many others) was for a member of the administration team to review all correspondence coming into the practice. Any letters which indicated that a GP needed to take action would be passed to the GP. All other correspondence which was for information only was scanned into the patients' electronic records. This process was a response to the increased workload faced by GPs and aimed to enable them to focus on patient care and tasks that required action.

3.3.24 The dosing information entered into the GPs EPR was contained in a field that would transfer information to the summary care record. However, the administrative note that the patient was required to gradually increase medication was added into a field that does not transfer to the summary care record. This meant that this information was not available to staff in the ED when they reviewed the summary care record.

3.3.25 During an interview with the patient's GP and while reviewing their electronic records, the GP identified this issue and on discussion could not identify how this issue might be mitigated in the future.

3.3.26 The investigation was later able to review details of the patient's neurology clinic letters from March 2019 to August 2023. From March 2021, it was stated that the patient was taking both doses of medication four times a day. It is not clear how the prescription remained unchanged for 4 years despite multiple changes in co-beneldopa dosing.

3.3.27 HSSIB is currently undertaking an investigation titled '[Workforce and patient safety: the digital environment – integration of systems](#)'. While this piece of work is not yet complete, early analysis indicates that many of NHS IT systems are not fully integrated and therefore the seamless sharing of a patient's medical information between primary and secondary care, and even between departments within some trusts, is not yet achievable.

Involving the patient and/or family in decisions

3.3.28 The investigation heard from the patient's son and his Parkinson's specialist nurse that the patient was very involved in the management of his condition. As Parkinson's progresses, the brain gets used to the increased dopamine from medication but the natural dopamine continues to decrease. This means people may need to increase their dose to maintain movement, or take other medications to support the brain and body in dopamine absorption and movement. These dose adjustments would routinely be managed by an outpatient neurology team. The patient was on a higher dose than was usual for a man aged 85; however, this dose worked for his symptoms and any attempts to reduce the dose resulted in a worsening of his symptoms. During his early diagnosis the patient's wife always went with him to appointments, and later the patient's son went with him.

3.3.29 When the patient was assessed by the medical doctor in the ED, his son was not present. The doctor told the investigation that the patient was not able to tell them his regular dose and so the doctor phoned his son. The son told the doctor the usual frequency for both strengths of co-beneldopa was four times a day. On this occasion, the doctor cross-referenced the information with the GP summary care record and attempted to review the neurology clinic letters.

3.3.30 As set out above, the doctor was unable to review any of the latest neurology clinic letters in the patient's electronic record, or contact the Parkinson's team or GP as this was outside of the working hours for those services. The doctor discussed this with their consultant who advised that the information could be followed up in the morning. This meant that the information in the GP summary care record was used to inform prescribing until confirmation could be made. This was not followed up with the GP (or Parkinson's team) the following day. The investigation could not identify whether this was handed over as a task to the day team or why it was not followed up.

3.3.31 The patient's morning dose was under prescribed; his son reported that both strengths should be taken, whereas the GP summary care record stated only the lower strength should be taken. Staff recognised that the GP summary care record was often not updated for various reasons. These could include the clinic letter not being sent to the GP practice or being sent but not acted on, or delays in updating the electronic record system.

3.3.32 The investigation heard conflicting opinions about listening to patients and/or their family members. Some staff thought that the GP summary care record was the key piece of information for prescribing and would only go to the patient/family if information was not available.

3.3.33 The patient's son told the investigation that the morning dose was his father's most important dose as the effects of the evening dose had worn off, and that his father had needed the medication in the morning to help him get moving. He shared that both he and his wife had visited EDs on several occasions with elderly parents who have complex medical needs. Although they had been able to provide information about their parents medication needs, they felt they were not always listened to by staff. They worried about what the experience may be like for other patients, who did not have family or carers with them when they attended an ED.

Local-level learning prompts for acute hospitals

The following prompts are provided by HSSIB in addition to those contained in the Royal College of Emergency Medicine's Quality Improvement Programme on time critical medication to help acute hospitals to improve safety for patients receiving time critical medications in the ED. These prompts may also be useful for other hospital departments who receive patients into their care.

- How does your organisation support staff to access information (including information from primary care and specialty teams) about patients' time critical medications?
- How does your organisation support patients to self-administer time critical medications, when appropriate?
- How does your organisation capture information when patients self-administer time critical medications?
- How does your organisation receive and consider information from families and carers to help avoid missed or delayed doses of time critical medications?

3.4 ePMA systems and time critical medication in the ED

3.4.1 The ePMA system at the Trust was on the same system as the EPR, as described in section 3.2. The system was not bespoke but was configured to meet the local Trust's needs. Although other trusts used the same system, the user experience would be different due to version control, upgrades and local configuration.

Outage

3.4.2 During the patient's time in the ED the electronic systems went down unexpectedly and were not available for use. This happened on the evening of day 2 and was rectified by midday on day 3.

3.4.3 The medical doctor who saw the patient in the evening of day 2 was able to prescribe some of the patient's medications on the ePMA as the dosages were clear from the information available. Once they had prescribed those, they moved onto the co-beneldopa. This involved speaking with the patient's son, checking his GP summary care record and confirming the dose with the consultant, and a plan to follow up in the morning. During these tasks, the electronic system went down and the doctor had to document the prescription on a paper chart.

3.4.4 At 12:00 hours the patient was due to take both strengths of co-beneldopa. At this point the electronic system was back in use but the co-beneldopa was available as a paper prescription only. At 12:23 hours the co-beneldopa was prescribed on the ePMA from 16:00 hours. There was no 12:00 hours co-beneldopa prescription as the time had already passed and it could not be retrospectively entered into the ePMA. However, once the ePMA was back online the paper prescription was considered redundant. Therefore, the patient did not have an electronic prescription for his lunchtime co-beneldopa and the doses were missed.

System usability

3.4.5 The investigation asked staff how easy or difficult they found the electronic system to use. Staff reported that they found it easy to use and many gave examples of working in other organisations with more difficult systems.

3.4.6 The investigation observed that if a medication was prescribed but had not been given, the medication field on the computer changed colour to flag to the nurse that it was due. Within 2 hours the medication displayed as yellow and after 2 hours it displayed as red.

3.4.7 Staff accessed the ePMA system either from static computers or using a computer on wheels. Medications were located in a medication room; the primary medication room was central in the ED, the secondary medication room was on a corridor. Staff wrote down the medication required on a piece of paper, took the paper to the medication room. This was because the computer on wheels would not fit in the medication room and there was no computer in the room. They then prepared the medication based on the transcribed information. They brought the medication back to the patient and computer on wheels and checked the medication against the electronic prescription. The medication was given and the electronic prescription was marked as given.

3.4.8 The above process was an adaptation made because it was not possible to access a computer in the medication room. Staff reported that they found it the easiest way to ensure they were getting the right medication for the patient. When asked if they were told to do this by colleagues/managers they said they had not been and “just figured it out”.

3.4.9 One observation of a nurse showed that it took an hour to give a patient their medications; this included obtaining equipment to prepare the medication. Each medication involved a separate visit to the medication room to reduce the risk of error. As a result, the process of administering the patient's medication was started 30 minutes after it was due, but they did not receive it until 1 hour after it was due.

Training

3.4.10 All staff reported that they had received training in using the ePMA system when they started working at the Trust, or when the system was implemented. The training was delivered through online sessions at staff's own pace. The majority of staff reported that although they felt they had training it took a few weeks to really understand how to use the system.

3.4.11 The online training taught staff how to do certain tasks on the ePMA but did not reflect the context within which they were working. Therefore, the learning only happened once in 'real-world' use.

3.4.12 Medical staff in training grade posts had experience of working across other organisations and reported that they were used to having training for new systems when starting at a new organisation. However, the investigation found that training for the ePMA system may not have included or prepared staff for circumstances when the ePMA system may not have been functional.

3.4.13 Staff described the difficulties working when the electronic systems were not available and said that this would undoubtedly contribute to potential errors. They would need to check various different information sources which they felt increased the likelihood of error.

3.4.14 A resident doctor told the investigation about the challenges they faced in the patient's care after the ePMA went down. They had not used a paper medication chart before and had to seek advice and guidance from an ED nurse to help locate a chart and begin to complete it. However, once they had been shown the paper medication chart they reported there were no issues with prescribing.

3.4.15 After seeking advice from the nurse, the resident doctor prescribed the co-beneldopa in the 'Parkinson's medication' section of the paper chart. This section contained three pages; the third page was used to write the prescription. It is not clear whether this affected the patient receiving their Parkinson's medication at midday, as the first two pages would have appeared blank if the chart was reviewed.

Local-level learning prompts for acute hospitals

The following prompts are provided by HSSIB in addition to those contained in the Royal College of Emergency Medicine's Quality Improvement Programme on time critical medication to help acute hospitals to improve safety for patients receiving time critical medications in the ED. These prompts may also be useful for other hospital departments who receive patients into their care.

- How does your ePMA system help to alert staff to patients who need time critical medications?
- How does your organisation train staff to use local ePMA systems and record when patients require time critical medications?
- How does your organisation support staff to work safely when ePMA systems may not be functioning to ensure time critical medications are not missed?
- How does your organisation audit delays or omissions in time critical medications and use this to improve delivery of time critical medication?
- Is your organisation aware of any adaptations that staff are required to make to ensure they can use the ePMA system effectively in local environments?

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5. Appendix: Investigation approach

A review of patient safety insights suggested a theme of medication-related harm. The investigation reviewed:

- reports to prevent future deaths
- reports to the Strategic Executive Information System (StEIS)
- reports made directly to HSSIB by the public
- previous Healthcare Safety Investigation Branch reports related to medication
- discussions with stakeholders to identify areas of concern.

Once a decision was made to proceed to investigation, further stakeholder discussions were held to identify more specific areas of concern and to understand the current patient safety landscape in relation to medication-related harm. Analysis of all the information obtained suggested a theme of medication not given, with three topic areas:

1. time critical medication in the emergency department
2. anticoagulants before and after a procedure
3. discharge to a nursing home.

A further theme emerged regarding electronic prescribing and medicines administration systems (ePMAs).

HSSIB's Chief Investigator authorised an investigation into each of these topics.

Evidence gathering and verification of findings

A local investigation was undertaken. This meant identifying and investigating a single patient safety event that occurred in relation to missed time critical medications in the emergency department (ED). The investigation visited the Trust where the patient safety event occurred. Meetings and interviews were held with staff involved in the patient safety event and key staff in the management of the ED. Observations of practice within the ED were also undertaken. The following practices were observed:

- streaming patients to most appropriate service
- booking patients in at reception
- triage
- ambulance triage
- board round
- medical handover
- doctor review of patients
- nursing medication round
- nursing in temporary escalation space (corridor care).

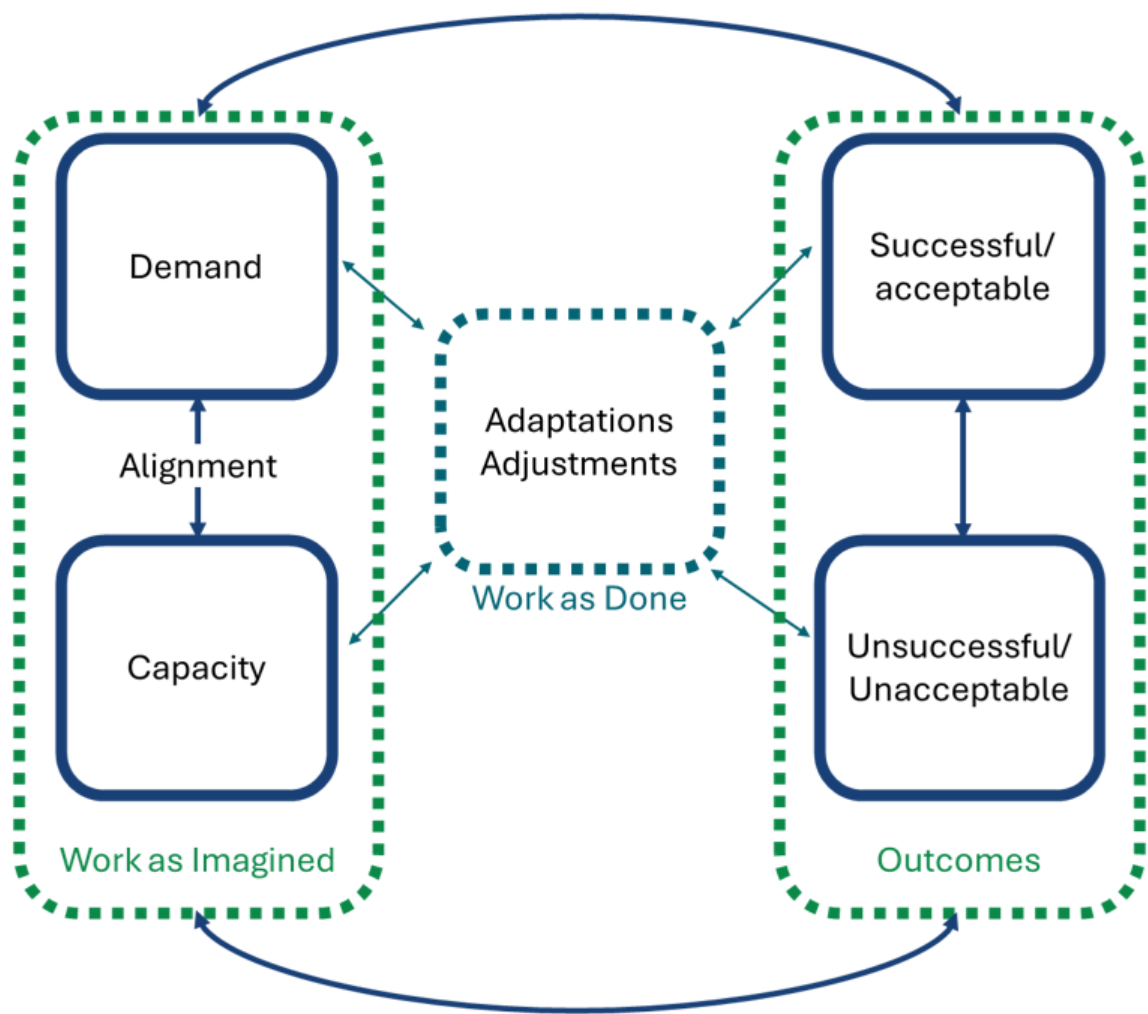
The investigation also met with the son and daughter-in-law of the patient involved in the patient safety event to understand their account of the patient's experience in the ED.

Evidence gathering took place between July and September 2024.

The investigation used the CARE model (see figure A) to identify adaptations and adjustments that staff made to practice to bridge the misalignments between demand and capacity (also known as ‘work as imagined’) (Anderson and Ross, 2020).

The investigation used the extracting resilience indicators worksheet within the CARE-QI handbook to identify resilience activities as well as opportunities for enhancing these. This is described within the text of each of the key themes included in this report.

Figure A The CARE model



Stakeholder engagement and consultation

The investigation engaged with national organisations to gather evidence at the beginning of the investigation to determine the scope of its work across the theme of medication not given. These organisations are listed in table A.

The local investigation then engaged with a range of organisations and staff involved in the patient safety event. Local stakeholders and key national organisations were consulted on the local investigation, including the Royal College of Emergency Medicine and Parkinson's UK. This also enabled checking for factual accuracy and overall sense-checking. The local stakeholders and national organisations linked to this investigation are also listed in table A.

Table A Investigation stakeholders

Local organisations	Family and staff	National organisations linked to the local investigation	National organisations
Acute NHS foundation trust where the patient safety event took place	The patient's son and daughter-in-law	Royal College of Emergency Medicine	NHS England
The patient's GP practice	Six ED nurses	Parkinson's UK	Medicines and Healthcare products Regulatory Agency
Acute NHS foundation trust where the patient's neurology and Parkinson's teams were located	Five ED Doctors		Independent Health Providers Network
	Two specialty consultants		The Community Pharmacy Patient Safety Group
	Administration manager		Royal Pharmaceutical Society
	Parkinson's specialist nurse		Academics
	Consultant pharmacist		Care Quality Commission
	External pharmacist consultant		National Institute for Health and Care Excellence
			Healthwatch
			The Patients Association

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