



Health Services Safety
Investigations Body

Investigation report

Sepsis: investigating under the Patient Safety Incident Response Framework (PSIRF)

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Theme:

Delayed diagnosis, Hospital care, Patient safety themes

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About this report

HSSIB has modelled an approach to investigating patient safety events under the Patient Safety Incident Response Framework (PSIRF). This is to support NHS organisations and investigation staff to increase their learning about how to investigate under this framework and provide examples of how PSIRF tools and guidance can be used to improve investigations. This report differs from the usual HSSIB report template as it uses the PSIRF patient safety incident investigation template.

The report also contains learning relevant to healthcare organisations and staff on how sepsis may be identified and defined when reporting patient safety events and investigating incidents where sepsis may be suspected.

Introduction

HSSIB engaged with a wide range of stakeholders, including clinicians and national leads, to learn more about the issues surrounding recognition of sepsis and to identify areas where an investigation could focus to help improve patient safety.

Although sepsis has been the focus of extensive national work, it has persisted as a safety risk. The themes from incidents and complaints have remained the same over time. Evidence from the intelligence gathered suggests that greater insight into the challenges faced at an organisational level in recognising sepsis would be helpful.

To support NHS organisations and local investigation staff, HSSIB identified an opportunity to model approaches to patient safety incidents investigations (PSIIs) under the NHS Patient Safety Incident Response Framework (PSIRF). Stakeholders told HSSIB that this would help to

increase local learning and provide examples of how PSIRF tools can be used to improve investigations. HSSIB has also used this opportunity to identify learning that may help to improve how PSIRF can support staff in carrying out incident investigations.

This investigation has used the PSII report template and PSIRF tools to investigate the recognition of sepsis in a medical assessment unit. Findings and areas for improvement are listed for the organisations that were involved in this incident. However, the learning may be relevant to other organisations.

Patient safety incident investigation (PSII) report

Sepsis: a patient with abdominal pain

Incident ID number:	I-031932 (HSSIB)
Date incident occurred:	5 to 7 July 2024
Report approved date:	17 June 2025
Approved by:	HSSIB

Terms used in this report

This patient safety incident investigation involves a district general hospital. To protect anonymity it is not named. The investigation involves the hospital's emergency department and acute assessment unit.

Distribution list

The patient's (Lorna's) daughters
Patient safety incident response lead
Staff nurse (x 2)
Healthcare assistant
Senior nurse (x 4)
Consultant (x 3)
Resident doctor (x 4)
Director of clinical governance

About patient safety incident investigations

Patient safety incident investigations (PSIIs) are undertaken to identify new opportunities for learning and improvement. PSIIs focus on improving healthcare systems; they do not look to blame individuals. Other organisations and investigation types consider issues such as criminality, culpability or cause of death. Including blame or trying to determine whether an incident was preventable within an investigation designed for learning can lead to a culture of fear, resulting in missed opportunities for improvement.

The key aim of a PSII is to provide a clear explanation of how an organisation's systems and processes contributed to a patient safety incident. Recognising that mistakes are human, PSIIs examine 'system factors' such as the tools, technologies, environments, tasks and work processes involved. Findings from a PSII are then used to identify actions that will lead to improvements in the safety of the care patients receive.

PSIIs begin as soon as possible after the incident and are normally completed within 3 months. This timeframe may be extended with the agreement of those affected, including patients, families, carers and staff. HSSIB started this investigation in January 2024, and it was completed in May 2025. The draft report was shared with all those affected for comments and feedback before being finalised.

If a PSII finds significant risks that require immediate action to improve patient safety, this action will be taken as soon as possible. Some safety actions for system improvement may not follow until later, according to a safety improvement plan that is based on the findings from several investigations or other learning responses.

An NHS organisation's investigation team follow the Duty of Candour and the [Engaging and involving patients, families and staff after a patient safety guidance](#) in their collaboration with those affected, to help them identify what happened and how this resulted in a patient safety incident. Investigators encourage human resources teams to follow the [being fair tool](#) in the minority of cases when staff may be referred to them.

PSIIs within NHS organisations are led by a senior lead investigator who is trained to conduct investigations for learning. The investigators follow the guidance set out in the [Patient Safety Incident Response Framework](#) and in the national [patient safety incident response standards](#).

A note of acknowledgement

This investigation focused on the care of Lorna, who sadly died in July 2024. We would like to thank Lorna's daughters, whose experiences have contributed to this investigation. They engaged with the investigation to help the team understand how the events affecting Lorna

unfolded, and the impact they had on all their lives. Information shared by Lorna's daughters helped inform the investigation and identify areas for improvement. In accordance with her daughters' wishes, Lorna is referred to by name throughout this report.

We would also like to thank the healthcare staff who participated in the investigation and who were keen to discuss and support improvements that might help make care for patients like Lorna safer in future.

About Lorna

Lorna's daughters kindly wrote the following words about Lorna to give the readers of this report a sense of her life, and the person she was.

Mum (Lorna) was a beautiful, easy going and gentle soul, happy with the simple things in life. She was always smiling, laughing, and dancing, full of life. She had such a zest for living, and her love for music was infectious. The Beatles, Eric Clapton, Tina Turner, and the Travelling Wilburys were some of her favourites. Her family have the most wonderful memories of dancing with her, jiving to rock and roll.

She was a yoga teacher for over 30 years, it was her passion, where she found a spiritual lifestyle, and helped so many people to feel calm and well. This is what truly defined her. People were naturally drawn to her gentle spirit; she connected with everyone she met with kindness and warmth. And she was loved by so many.

Mum became a grandmother in her late 40's and the bond she shared with all her grandchildren was incredibly special. They spent so much time together, going on holidays, sharing fun and laughter. We'll always think of you popping round for a cup of tea.

She was an animal lover and had a special relationship with all her pets. Rio, her beloved dog, was her constant companion, and losing him during Covid was especially hard. We like to think that they're together again now.

Sadly, mum had to give up yoga due to mild Parkinson's, but true to form, it never stopped her. She remained fiercely independent — still out and about, enjoying a vibrant social life, trips with friends, she even attended her much loved boxing class the day before she went into hospital.

Mum was strong, brave and stoic when she needed to be. She raised her daughters as a single mum; a tough job, which she did her very best at. She was so proud of her girls and her five grandchildren. They meant the world to her, and she shone with love and admiration for them all.

Executive summary

Incident summary

On 5 July 2024, at 12:44 hours, Lorna arrived at the emergency department in an ambulance. She had been having severe abdominal pain since that morning and had a fast heart rate while in the ambulance. The emergency department team thought Lorna may have a blood clot in her lung and planned to check for this with a computed tomography (CT) scan (a medical imaging technique that uses X-rays and a computer to create detailed, cross-sectional images of the body). Another CT scan was also requested to check for the cause of her abdominal pain and her care was discussed with the surgical team.

On 6 July 2024, at 10:14 hours, Lorna was admitted to the acute assessment unit (AAU) to wait for the CT scans. At 12:00 hours, Lorna's vital signs (signs that are routinely monitored when a patient is in hospital, such as blood pressure and temperature) indicated that she may be becoming more unwell. At 15:22 hours, Lorna's vital signs and her NEWS2 score (a score to assess the risk of a patient's clinical condition deteriorating) showed that she was unwell and had low blood pressure. A doctor was consulted, and Lorna was prescribed fluids to treat her low blood pressure.

At 16:03 hours, Lorna was moved from the AAU for the planned CT scans. She was away from the AAU for about 1 hour, during which time the results of blood tests taken earlier that day were made available on Lorna's electronic patient record. The blood tests suggested Lorna was unwell, with evidence of inflammation in her body and damage to her kidneys.

At 16:57 hours, when Lorna returned to the AAU, she was still unwell. In response to her vital signs being outside the normal ranges, and a high NEWS2 score, she was seen by a specialist critical care outreach nurse who reviewed Lorna and confirmed that there was a plan in place to treat her low blood pressure with fluids.

At 18:47 hours, staff took further vital sign observations that suggested Lorna's condition had deteriorated further. A doctor was called, and they came to see Lorna in person. They recognised that Lorna may have sepsis and began treatment with antibiotics.

Lorna continued to receive treatment on the AAU, but her condition continued to get worse.

At 22:00 hours, Lorna's condition suddenly deteriorated, and an emergency team was called to help with her treatment. She was seen by a consultant from the intensive care unit, to which she was transferred. Lorna's condition continued to worsen, and she died the following day.

Summary of key findings

The investigation found that:

- Lorna did not show signs or symptoms of infection or sepsis while she was in the emergency department. These began to become apparent after she was admitted to the AAU and became more suggestive of sepsis when the results of blood tests and scans were made available.
- Lorna was more unwell on her admission to the AAU than staff realised. This was impacted by the additional score reflecting Lorna's need for oxygen to help her breathe not being included in her total NEWS2 score.
- Doctors in the AAU did not always have capacity to review patients in person. When Lorna's care was reviewed remotely the information available to the doctor was limited to the electronic record and verbal handover from the nurse.
- The design of the hospital's tool to support staff to escalate unwell patients led staff to leave out information that is not included in NEWS2 (such as how the patient 'seems'), which can limit staff's understanding of the patient's clinical condition.
- The nurse in charge of the AAU was not routinely involved with the care and escalation of deteriorating patients and there was no direct route of escalation from the nursing staff looking after the patient to a senior medical doctor or consultant.
- There was evidence to suggest Lorna became confused during her time on the AAU and this was not reflected in her NEWS2 score at any point. Staff reported difficulty understanding whether confusion is 'new'.
- Lorna's family expressed concerns that they were unable to advocate for her wellbeing and that their concerns about how unwell she was were not always heard.
- Nursing staff were reluctant to answer the first question of the sepsis screen – which asks 'does the patient have signs or symptoms of an infection?' – because they did not want to commit to a diagnosis if no infection had been identified.
- There is variation in the understanding between AAU staff and critical care outreach staff of what the critical care outreach team aim to do when they see a patient who has a high NEWS2 score.

Summary of areas for improvement and safety actions

The investigation identified 5 areas of improvement which the hospital could develop safety actions to address.

Area of improvement 1

There is limited understanding and awareness of processes to support family and carer involvement in clinical decision making about deterioration.

Area of improvement 2

New confusion in patients is not consistently accounted for in NEWS2 scores.

Area of improvement 3

Staff perceive that a diagnosis of infection is needed before completing the sepsis screening tool.

Area of improvement 4

There are challenges in how tools and processes enable the care of deteriorating patients to be escalated to, and overseen by, senior medical and nursing staff.

Area of improvement 5

There is variation in the understanding of the role of the critical care outreach team in managing the care and treatment of deteriorating patients.

Background and context

What is sepsis?

Sepsis is a life-threatening condition that happens when the body's response to an infection injures its own tissues and organs (Singer et al, 2016). The clinical term for this is 'organ dysfunction'.

Sepsis is the main cause of death from infection, especially if it is not recognised and treated promptly (Singer et al, 2016). There are varying estimates of the number of deaths from sepsis. The UK Sepsis Trust states that there are up to 48,000 sepsis-related deaths in the UK each year (The UK Sepsis Trust, n.d.). The Office for National Statistics, which collects data from death certificates, recorded 26,203 sepsis-related deaths in England and Wales in 2023 (Office for National Statistics, 2024). Some people can potentially survive sepsis if they have the right treatment in a timely manner (Academy of Medical Royal Colleges, 2022; Singer et al, 2019).

There have been initiatives to improve the recognition and timely treatment of sepsis over the last 20 years, yet it has persisted as a safety risk. Furthermore, the themes from incidents and complaints have remained largely the same over time (Parliamentary and Health Service Ombudsman, 2023).

How is sepsis diagnosed?

Sepsis is not a specific illness. The diagnosis is based on a number of signs and symptoms in a patient with suspected infection (Singer et al, 2016). Sepsis can be difficult to diagnose even for experienced clinicians because:

- the signs of sepsis can be vague and can mimic other illnesses, particularly in the earlier stages of the condition
 - there is no single sign that uniquely points to sepsis
 - there is no single diagnostic test to confirm or rule out sepsis
 - there is no one predictive tool or set of clinical decision rules that has been evidenced to reliably determine who has sepsis
 - symptoms can show differently in different people, depending on their age, immune system, underlying health conditions, medications they take and the source of their infection.
- (National Institute for Health and Care Excellence, 2024)

Are some people more at risk of sepsis?

Yes. People in the following groups are at more risk of developing sepsis:

- the very young (under 1 year old)
- older people over 75 years or who are frail
- people with diabetes
- people with a weakened immune system such as those having chemotherapy treatment
- people with a genetic disorder that affects their immune system, such as people with Down's syndrome or sickle cell disease

- people who have recently had surgery or a serious illness
- people who have given birth, had a miscarriage or termination of pregnancy in the past 6 weeks. (National Institute for Health and Care Excellence, 2024; NHS, 2022)

Are guidance and tools available to support clinicians to recognise, diagnose and treat sepsis?

Yes. The National Institute for Health and Care Excellence (NICE) published guidance on the recognition, diagnosis and early management of suspected sepsis in 2016 and this was updated in 2024. The Academy of Medical Royal Colleges (AoMRC) published a statement on the antibiotic treatment of sepsis in 2022. The UK Sepsis Trust has also published resources and tools to help with the recognition of, and response to, suspected sepsis. NICE (2024) and AoMRC (2022) guidance highlights the importance of finding the source of any infection and taking action to control it. Sometimes control is achieved by antibiotic treatment; other times a surgical or drainage procedure may be needed in addition. Both NICE and AoMRC recommend the use of a tool called the 'national early warning score' (NEWS2) to assess the risk of severe illness or death from sepsis.

NEWS2 is a scoring tool developed by the Royal College of Physicians (2017). The tool was not developed specifically for sepsis, but rather to help improve the recognition of, and response to, patients who are becoming more unwell whatever the cause. NICE guidance states that NEWS2 should be used to support clinical decision making, not to replace clinical judgement. This means that a patient's history, the findings from any physical examination, and any other reasons for concern must also be taken into account. Although there is evidence to support the use of NEWS2 in the context of sepsis (Inada-Kim, 2022), NICE (2024) states that further research is needed.

Using the NEWS2 tool involves giving a number to vital signs, or parameters, that are routinely measured when a patient is in hospital or a setting where their health is being monitored. The six vital signs are:

- respiratory (breathing) rate
- oxygen saturation (the amount of oxygen in a person's blood)
- temperature
- blood pressure
- pulse rate
- consciousness.

The number given to each vital sign is based on how far outside the expected range it is; the higher the number the more the vital sign varies from the norm. The numbers are then added up to give an overall score. Two points are added to the score for people who need oxygen to maintain their recommended oxygen saturation (see figure 1). The total score is used to indicate the person's risk of severe illness or death (see figure 2), prompt any actions to be taken, and decide the frequency of monitoring.

Figure 1: The NEWS2 scoring system (Royal College of Physicians, 2017)

Chart 1: The NEWS scoring system

Physiological parameter	3	2	1	Score 0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO ₂ Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO ₂ Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

Consciousness is assessed according to the following descriptors:

- alert (A)
- new confusion (C)
- responds to voice (V)
- responds to pain (P)
- unconscious (U).

Figure 2: NEWS2 scores and risk of severe illness and death (Royal College of Physicians, 2017)

Chart 2: NEWS thresholds and triggers

NEW score	Clinical risk	Response
Aggregate score 0–4	Low	Ward-based response
Red score Score of 3 in any individual parameter	Low–medium	Urgent ward-based response*
Aggregate score 5–6	Medium	Key threshold for urgent response*
Aggregate score 7 or more	High	Urgent or emergency response**

* Response by a clinician or team with competence in the assessment and treatment of acutely ill patients and in recognising when the escalation of care to a critical care team is appropriate.

**The response team must also include staff with critical care skills, including airway management.

The hospital involved in Lorna's care used NEWS2. Its own hospital policies for monitoring and escalation of adult patients who are becoming more unwell reflected NICE (2024) guidance.

In its statement on the initial antibiotic treatment of sepsis, AoMRC included a framework to help clinicians in their decision making and initial evaluation of sepsis. The framework linked NEWS2 scores to timeframes for actions to be taken and antibiotics given (see figure 3).

AoMRC also recommended that research be carried out to evaluate the use of NEWS2 to guide the initial evaluation of sepsis.

Figure 3: Decision support framework to help clinicians with their initial evaluation of sepsis in adults 16 years or older (Academy of Medical Royal Colleges, 2022)

Vital signs	Vital signs: NEWS-2 'Physiology first'	0	1-4	5-6	≥7
Initial assessment	History, examination, lab results	<i>If clinical or carer concern, continuing deterioration, surgically remediable sepsis, neutropaenia, or blood gas / lab evidence of organ dysfunction, including elevated serum lactate, upgrade actions at least to next NEWS-2 level →</i>			
	Comorbid disease, frailty, patient preferences?	<i>Consider influence of comorbid disease, frailty and ethnicity on NEWS-2, and patient preferences for treatment intensity, limits, end-of-life care</i>			
Initial (generic) actions	Monitoring and escalation plan	Standard observations	- Registered nurse review <1 h - Obs 4-6 hrly if stable. - Escalate if no improvement	- Obs hourly. - Review <1 hr by clinician competent in acute illness assessment - Escalate if no improvement	- Obs every 30 mins. - Review <30 min by clinician competent in acute illness assessment. - Senior doctor review <1 hr if no improvement: refer to Outreach or ICU
	Initial treatment of precipitating condition	Standard care	<6 hr	<3 hr	<1 hr
Likelihood of infection & specific actions	Unlikely	Standard care	Review daily and reconsider infection if diagnosis remains uncertain		
	Possible	Review at least daily	< 6 h Source identification & control plan documented.	< 3 h: - Microbiology tests - Antimicrobials: administer or revise - Source identification & control plan documented.	< 1 h: - Microbiology tests - Antimicrobials: administer or revise (broad-spectrum if causative organism uncertain).
	Probable or definite	< 6 h Diagnostic tests & R plan	< 6 h - Microbiology tests - Antimicrobials: administer or revise - Source identification & control plan. - D/w ID/micro if uncertain, & review	< 6h - Source control initiated 48 – 72 h - Review antimicrobials with ID/micro/senior clinician	< 3 h - Source identification 3-6 h - Source control initiated according to clinical urgency 48 – 72 h: - Review antimicrobials with ID/micro/senior clinician

Most NHS hospitals have electronic patient records. Sepsis alerting tools have been developed that can be incorporated into these records to produce an automated alert in response to set triggers. Most sepsis alerts in NHS hospitals are based on NEWS2 (Honeyford et al, 2023). There is not yet enough evidence to confirm whether they help improve care for patients with possible sepsis (Academy of Medical Royal Colleges, 2022). The hospital Lorna was admitted to uses a mix of paper and electronic patient records. Vital signs are uploaded to the electronic patient record via a handheld device which automatically calculates a NEWS2 score based on the values recorded. Prompts to act, such as escalate to the staff nurse, or consider completion of a sepsis screen, are automatically prompted on the device if the NEWS2 score is high.

Lorna's experience

Friday 5 July 2024

Lorna was brought into the emergency department (ED) by an ambulance because she had been experiencing severe abdominal pain during the day. When she arrived, the paramedic handed over her care to ED staff and explained that Lorna's heart was beating very fast. They suggested this could be a sign of sepsis. The team in the ED considered whether the fast heart rate was likely due to sepsis but decided that this was not the most likely diagnosis. The ED team found that signs and symptoms of infection were not present, nor other markers for possible sepsis such as in Lorna's blood tests that were taken while Lorna was in the ED.

The ED team considered what other problems could be a cause of Lorna's high heart rate, such as a heart problem or blood clot in the lung. These causes of a high heart rate can also be life threatening and so needed immediate investigation. The team did an electrocardiogram (ECG) (a test that records the electrical activity of a person's heart, including the rate and rhythm) which suggested that Lorna's heart itself was not the main cause of her high heart rate. This led them to consider whether she had a clot in her lung (a pulmonary embolism). Lorna was given medicine to make sure that if she did have a clot it would not get worse, while she waited for a CT scan to check whether that was the cause of her symptoms. The ED team also contacted the surgical team to discuss Lorna's abdominal pain.

Saturday 6 July 2024

While Lorna was in the ED, her NEWS2 score did not meet the threshold for escalation, reaching a high of 3 before she was transferred to the acute assessment unit (AAU). The oxygen levels in her blood were below the normal range, and so the team gave her extra oxygen to help her breathe. She also continued to have a high heart rate.

When Lorna was admitted to the AAU at 10:14 hours, her NEWS2 score was 4. At this point her heart rate had returned to within normal limits, but her blood pressure was low and the oxygen levels in her blood remained below the normal range. Soon after arriving, Lorna was seen by

the medical team, who reviewed her care. They agreed to continue with the plan to give Lorna a CT scan to find out if she had a clot in her lung and added a CT scan to identify whether she had a problem in her abdomen, causing her pain. At this time, Lorna's signs and symptoms were still thought to be consistent with a possible clot in her lung.

At around noon, Lorna had another set of observations (measures of her vital signs) taken. At this time her NEWS2 score was recorded as, and understood to be, 4. However, the oxygen she was having to help her breathe was not counted in the score.

At 15.22 hours, Lorna had another set of observations taken. These showed her blood pressure was low, and she was breathing very quickly. She still needed oxygen to help her breathe. At this time, her NEWS2 score was recorded as 8, indicating she had deteriorated further. The staff caring for Lorna recognised a doctor needed to be informed, so they called them to tell them about the high NEWS2 score. The doctor asked for Lorna to be given intravenous fluids (fluids into her veins) to treat her low blood pressure. This was started immediately.

At 15:30 hours, Lorna had another set of observations taken. These showed that although her blood pressure had increased a little and her breathing was a little slower, they were both still outside the normal range. Her recorded NEWS2 score remained an 8.

At 16:03 hours, Lorna had another set of observations taken. These showed that her blood pressure and breathing rate were both still outside normal limits, and that she still needed oxygen to help her breathe. Her NEWS2 score was 8.

Soon after these observations, Lorna was moved from the AAU to have a scan to identify whether she had a clot in her lung, and a scan to identify what was causing her abdominal pain. From the medical records, Lorna looked to have been away from the unit for about 1 hour.

At 16:57 hours, when Lorna returned to the unit, she had another set of observations. These showed that her blood pressure had returned to normal levels, but that she was still breathing quickly, and her heart rate was a little faster than the normal range. She still needed oxygen to help her breathe, and the oxygen levels in her blood remained below the normal range. At this time, her NEWS2 score was 7.

At 17:02 hours, Lorna was visited by a specialist nurse who provided critical care outreach services. They reviewed her care plan and advised that she did not need specialist critical care input at that time. The specialist nurse acknowledged that the unit's medical team were aware of Lorna's condition and had made a plan to provide fluids and manage her blood pressure.

At 18:47 hours, Lorna had another set of observations taken. These showed that her blood pressure had fallen again, her heart rate was fast, and the oxygen levels in her blood remained below normal levels despite being given extra oxygen. Lorna's NEWS2 was scored as 9; however, she had become confused and this was not included in the score.

Lorna's care was escalated to the doctor covering the unit, who reviewed her in person. Results of blood tests that became available at 17:15 hours were reviewed, and it was noted that Lorna was showing signs of potential sepsis and organ dysfunction with kidney damage.

At 18:50 hours, antibiotics were prescribed, which Lorna received 40 minutes later. Lorna had some readings taken of her blood gases, to help understand whether she could have sepsis, and at 19:45 hours the doctor discussed her condition over the phone with a senior doctor on call.

At 20:30 hours, observations were attempted but were inconclusive because Lorna's hands and feet were too cold to identify the oxygen levels in her blood. Staff continued to try and take a reading but were unable to.

At 21:35 hours, a further set of observations identified that Lorna's blood pressure was dangerously low, and an emergency call for help was placed. She was reviewed by the night doctor and further treatment was planned, including more fluids and antibiotics. Lorna was then seen by the critical care outreach team again, who took more blood tests and continued to monitor her condition.

At 22:45 hours, Lorna was reviewed by the intensive care team, who advised she should be admitted to their care and her treatment escalated. At 22:50 hours, Lorna was admitted to the intensive care unit, where she received continuous monitoring and increased treatment. Despite this, Lorna's condition continued to get worse and, she died at 12:15 hours on 7 July.

Investigation approach

Investigation team

Role	Initials	Job Title	Dept/directorate and organisation
Investigation commissioner/convenor:	This investigation is one of three PSII exemplars about sepsis		HSSIB
Investigation lead:	The report is led by, and a publication of, HSSIB rather than any individual		HSSIB

Summary of investigation process

An incident report was submitted within the hospital on 15 July 2024, following an audit of sepsis care. The report raised concerns about how long it took for Lorna to receive treatment after she showed signs and symptoms suggestive of sepsis. The incident was initially reviewed by the medical team, before being referred to the Trust incident review group for a discussion about how best to respond.

During this time, Lorna's daughters had filed a complaint with the Trust about the care their mother had received. This complaint referenced the recognition and response to sepsis, and how they were communicated with during their mother's admission to the hospital.

The incident was presented to the incident review group on 25 July 2024, where it was decided that a patient safety incident investigation (PSII) would be completed by the Trust. Lorna's daughters were contacted on 2 August 2024 to inform them that their complaint would be managed through the incident investigation process, and a meeting to hear their concerns was held on 19 August 2024.

In line with expected practice for NHS organisations, the incident and planned investigation was recorded on the NHS incident database in use at that time. HSSIB reviewed this database as a source of information about patient safety issues. After reading the details of the event on the database, a meeting took place between HSSIB and senior staff from the hospital. After discussion, it was agreed that Lorna's experience would be the focus of one of three HSSIB investigations about sepsis. The hospital worked with the HSSIB team during the investigation.

The draft report was shared for comments with all those affected by the event including Lorna's daughters and staff involved either directly or indirectly in Lorna's care. These people will also receive a final copy of the report once it has been approved by HSSIB. Progress on safety actions to address the areas of improvement included will be monitored by the relevant safety leads in the hospital.

Terms of reference

The terms of reference for this investigation were informed by information shared by Lorna's daughters, and the concerns they shared during the investigation's first meeting with them. Key staff involved in Lorna's care, either directly or indirectly, also helped to shape the areas of focus.

This investigation will:

- explore when and what signs and symptoms of sepsis Lorna had when she was in hospital

- explore factors that influenced staff response to signs that Lorna was becoming increasingly unwell
- identify opportunities for improvement in the timely recognition of sepsis.

Further details about the terms of reference, and how the investigation addressed these, can be found in appendix 1.

Information gathering

The investigation gathered information from multiple sources and sought different perspectives on events. The investigation considered how factors such as the environment, equipment, tasks, policies and organisational culture influenced the decisions and actions of staff.

Information sources included:

- Lorna's daughters
- staff directly or indirectly involved in Lorna's care
- Lorna's clinical records
- national and local guidelines about sepsis
- articles and research about sepsis
- an international sepsis subject matter advisor.

The investigation used a number of different methods to help organise, understand and analyse the information gathered. Methods included:

- developing a timeline to help make sense and create a narrative understanding of events
- creating a map of all the relevant organisations, at different levels of the healthcare system, from government to hospital, to illustrate how these related to the activities of staff
- using a framework (called the Systems Engineering Initiative for Patient Safety (SEIPS)) to inform information gathering and help examine the data gathered. The framework prompts investigators to consider how work factors such as the environment, equipment, organisational policies and procedures interact to influence the actions and decisions of staff (see appendix 2)
- developing themes from analysis of the information gathered to help understand and explain why things happened in the way they did
- application of NHS England's '[Safety action development guide](#)' to inform thinking about the development of areas of improvement and safety actions
- use of an evidence log to document the information sources used to inform the investigation.

Findings

This section sets out the findings from the investigation's analysis of the information gathered. The findings are presented under the following headings:

- Recognition of Lorna's signs and symptoms of sepsis
- Tools to support understanding of patient condition and consideration of sepsis
- Team working arrangements to support care of the deteriorating patient.

Recognition of Lorna's signs and symptoms of sepsis

The investigation found that it was not until Lorna was admitted to the AAU that blood tests and vital signs became suggestive of sepsis.

In the emergency department, Lorna's vital signs showed that she was unwell, in particular her heart rate was raised. The cause of her symptoms was not known, but staff considered her symptoms as being most suggestive of a clot in her lung. The team considered possible infection of a bowel condition Lorna had, called diverticular disease (a digestive condition that affects the large intestine), but blood tests in the emergency department did not show evidence of an infection. The investigation found that sepsis was not considered to be the cause of Lorna's symptoms at this time.

On the afternoon of 6 July, when Lorna was on the AAU, clinical staff told the investigation that, in hindsight, her blood results and vital signs became more suggestive of sepsis.

At 12:00 hours, Lorna's NEWS2 score was recorded as 4. Nursing notes record a score of 2 for Lorna's low blood pressure and 2 for low blood oxygen levels. A score of 4 does not prompt a review by a doctor (see 'Background and context' section) and meant that Lorna continued to receive observations every 4 hours, instead of every hour. However, at this time Lorna's need for oxygen was not counted in her NEWS2 scoring. If Lorna's need for oxygen had been accounted for, in line with national and local guidance, she would have met the threshold for escalation to a doctor at this time. This is explored further in the next section.

Lorna did not receive her next observations until 15:22 hours, when her condition had worsened further. Her vital signs were outside of normal ranges (respiratory rate of 41, and blood pressure 75/40) and her NEWS2 score was 8. Local guidance states that observations should be repeated within 15 minutes of this NEWS2 score and Lorna's observations were taken again at 15:30 hours. At this time, her NEWS2 score was 9. The nurse looking after Lorna noted that she was sweaty, drowsy, and hot. Staff involved in her care reflected during the investigation

that this NEWS2 score suggests a “very sick patient”. The query about a possible clot in her lung remained so Lorna was taken to the scanning department to clarify whether this was the cause of her symptoms.

While Lorna was in the scanning department the results of blood tests taken earlier in the day became available. These tests showed that Lorna was starting to have kidney problems and that a common indicator for inflammation was much higher than the normal range (C-reactive protein (CRP) – a protein made by the liver which increases when there is inflammation within the body, such as is typical in response to an infection). These results showed that Lorna’s organs were not functioning normally and raised the possibility that she had an infection. The investigation heard from senior clinical staff within the investigation that this, together with the results of Lorna’s scan that were available at 17:22 hours, which showed she did not have a clot in her lung, made sepsis a possible diagnosis.

National guidance recognises that the detection of sepsis “can be challenging because the clinical presentation of sepsis can be subtle, non-specific and highly variable” (Royal College of Physicians, 2017). Staff who cared for Lorna while she was on the AAU said that her deterioration was “unexpected” and that they were “not expecting something so abnormal to come out of the blood [tests]” when they were reported on the afternoon of 6 July. Reflecting on Lorna’s care, staff who saw her on her admission to the AAU described her symptoms as consistent with a clot in her lung. They were reassured by blood tests taken within the emergency department that did not show signs of inflammation, which may have suggested infection.

It was at 18:47 hours, after reviewing Lorna that the doctor documented sepsis as a possible diagnosis in the medical records. However, one of Lorna’s daughters told the investigation that she sent a message on her phone to say that “they had confirmed sepsis” at 18:20 hours. Lorna’s daughter told the investigation that she “pleaded” for antibiotics to be given. Further, she said that, from the text message she sent, antibiotics may have been given seven minutes outside of the time recommended in national guidance. Following the doctor’s review, Lorna received treatment for sepsis and medical staff ordered tests to identify whether this was the cause of her deterioration. Lorna received her first dose of antibiotics 40 minutes after the doctor documented sepsis was suspected in the medical records.

Tools to support understanding of patient condition and consideration of sepsis

In line with national guidance (see ‘Background and context’ section), the hospital Lorna was admitted to used NEWS2 to track a patient’s vital signs and trigger a clinical response if their condition begins to deteriorate. The tool was used across the hospital, inpatient wards and the emergency department.

On the AAU, where Lorna was admitted when she began to deteriorate, a mix of paper and electronic records were used. Electronic records were used for recording observations and generating NEWS2 scores, and paper notes were used to record other clinical work such as nursing assessments and doctors' rounds. Staff uploaded patient observations to an electronic patient record via a handheld device. The electronic patient record then automatically calculated a patient's NEWS2 score. If the NEWS2 score was elevated (a score of 5 or above, or 3 for a single vital sign) a prompt appeared on the screen of the handheld device for the nurse or healthcare assistant to take action, and the patient was automatically added to the critical care outreach team list of patients to review.

At 12:00 hours Lorna's NEWS2 score was documented in her paper records as 4: low blood pressure (2) plus low blood oxygen levels (2). Her need for oxygen was documented but not included in the scoring. If the need for oxygen (which scores 2) had been included, her NEWS2 score would have totalled 6. At 15:30 hours, Lorna's NEWS2 score was again documented in her paper records. This time, her need for additional oxygen was included and her NEWS2 score was correctly recorded as 6. Staff were unable to remember why Lorna's NEWS2 score did not include the score of 2 for additional oxygen at 12:00 hours. They noted that the handheld devices normally used to record vital signs eliminate this risk by automatically calculating the NEWS2 based on the information entered.

The investigation was unable to determine why Lorna's NEWS2 score was entered into her paper notes. Staff working on the AAU reported it is "not often we document notes on paper" and that "we don't unless the systems are down". The nurse caring for Lorna that day, who entered the NEWS2 score into the paper records, said observations "have to go on the [electronic patient record]" and they could not recall or explain why they were entered on the paper notes on this occasion. The investigation did not hear of similar incidents in which NEWS2 scores were manually generated and instead heard of consistent practice using handheld devices to automatically generate NEWS2 scores.

Further difficulties in accurately reflecting Lorna's condition using the NEWS2 tool were found when Lorna became confused. Lorna's family remember that when they arrived at around 17:30 hours, they were told Lorna had been confused "for some time". They told the investigation they were "in disbelief at how incredibly ill" their mum was and how she was "incoherent". At 18:50 hours, when Lorna was reviewed by the evening doctor, she was noted to be 'confused' in the paper documentation. This vital sign scores a '3' on the NEWS2 tool for a patient who is confused or has reduced consciousness levels. However, Lorna's NEWS2 scores never reflected anything other than 'alert' (0) for the duration of her admission to the AAU. At the time the evening doctor saw Lorna, her NEWS2 score was recorded as 9. This did not include the score for confusion, which if added, would have resulted in a NEWS2 score of 12. Guidance

sets out the expectation that a score of either 9 or 12 receives an emergency response, as both scores indicate that the patient requires the highest level of escalation. Lorna's story highlights the importance of recognising and scoring new confusion in NEWS2.

Lorna's daughters reflected on their experience discussing their mother's new confusion and overall condition with staff. They said they found it "hard to get the point across that she was so different to how she normally was" and described telling staff that she was very confused but "receiving no acknowledgement". This aspect of Lorna's care caused significant distress for her daughters, who felt they needed to advocate for her because she was not able to advocate for herself. They describe how they needed to "insist they [staff] monitor and provide fluids" and "begged" for antibiotics to be given. Lorna's daughters told the investigation that staff "told us there was nothing wrong with her" and told one daughter to "stop crying" because "she [Lorna] was fine". Lorna's daughters said "there was no one calling for help" and that they "just couldn't comprehend why everyone was behaving like there was nothing wrong".

The importance of giving particular attention to family concerns is included in national guidance for sepsis (National Institute for Health and Care Excellence, 2024). In addition, a national initiative known as 'Martha's Rule' is being rolled out in 143 hospital sites, which provides patients and families with a way to seek rapid review by someone outside of their immediate care team if they have concerns about deterioration (NHS England, n.d.). The investigation found that in the AAU, notices displaying the number people could call to escalate concerns were limited, and that staff on the unit did not all know of the initiative.

Area of improvement 1

There is limited understanding and awareness of processes to support family and carer involvement in clinical decision making about deterioration.

The investigation spoke to staff responsible for the oversight of sepsis compliance across the hospital about how confusion is scored on NEWS2. They explained that, generally, staff reported difficulty with knowing whether confusion was 'new' and so was often not counted in NEWS2 scoring. National guidance states that if it is not known whether confusion is 'new' it should be scored for until confirmed otherwise (Royal College of Physicians, 2017). Further, the investigation heard that measuring aspects of a patient's clinical signs and symptoms (such as a patient being sweaty or feeling hot) that cannot be measured with a number is challenging, and that staff can be focused on the "numbers" without "looking at the patient".

Area of improvement 2

New confusion in patients is not consistently accounted for in NEWS2 scores.

The investigation also heard from staff that NEWS2 was used to escalate Lorna's condition to the doctor when her deterioration was recognised at 15:22 hours. The doctor who carried out the review said that they would have had a clearer understanding of Lorna's condition if they had been told she was 'drowsy and sweaty' as was described in her paper notes. They told the investigation that these details, "would immediately make me jump to something significantly more serious". This level of detail about how the patient looks and seems is not captured in the NEWS2 score.

The investigation heard about the process of escalation to doctors on the AAU, and the information available to them. The doctors described a verbal handover of the patient's condition, guided by an escalation tool (the use of which is explored below). This is followed by either a review of the patient in person, or a remote review. A remote review is done on a computer using the patient's electronic records. This electronic patient record contains the patient's vital signs, associated NEWS2 scores, and the results of blood tests reported through the laboratory. Therefore, the investigation found that the doctor's review following verbal handover is limited to the information conveyed through the 'numbers' (vital signs and results of blood tests) as there is no access to paper-based free-text comments or notes.

The investigation heard from the doctors involved in Lorna's care that the AAU is a busy unit, with "multiple [high] NEWS2 scores" escalated during a single shift. A senior nurse from the unit described how they care for "a lot" of patients with high NEWS2 scores, as they accept patients directly from the emergency department, and their health can deteriorate soon after that. Lorna's family, however, remember Lorna being the most unwell patient in the bay, with other patients sitting up and talking to one another. As described below, a NEWS2 score and associated vital signs are used to support escalation of a patient's condition from the nurse to the doctor. The investigation heard from a doctor describing a typical clinical assessment that vital signs and clinical condition are both important, and "we use them together, we cannot just look at them apart". The investigation heard that when a patient is reviewed in person, other sources of information are available, such as the paper records including the handwritten nursing notes, and conversation with the patient and staff caring for them. Put together, these provide a more complete picture about the patient and how they are feeling. However, these sources are not available to the doctors when carrying out a remote review and information contained in verbal handovers can be limited because of activity and demands within the AAU.

As described above, local guidance gives staff a communication tool to guide verbal escalation to the medical team about a patient who has a high NEWS2 score. This tool is provided on all adult inpatient wards, including the AAU, and is expected to be entered into a patient's paper

notes every time a NEWS2 escalation happens. The tool contains a space for the reason for the escalation, space for each vital sign, the time completed, the name and grade of doctor escalated to, and a space to document instructions received after the escalation.

When describing how they use the escalation tool, staff on the unit advised “it just helps you with the next step” and “it’s more of a prompt that you are concerned about this patient”. Staff explained that the focus is to “fill out the obs [observations] ... because that’s obviously what the doctor’s going to want to look at”. During the time Lorna was on the AAU, this tool was used to guide the verbal escalation in several instances when her NEWS2 score was high. The investigation found that the design of the tool can lead staff to focus only on the escalation of vital signs and what is documented, without including or asking for additional information, such as the patient feeling drowsy and sweaty, that would help the clinical team understand the patient’s condition more completely.

Local guidance within the hospital provides staff with a screening tool to support their recognition of possible sepsis. This tool is available to staff electronically and on paper. The investigation heard that the intention is that sepsis screens will be completed on the electronic device when prompted, and that paper copies are available for those instances in which the electronic system is not available. The investigation was shown how, when a high NEWS2 score is generated on a handheld device, the user is automatically taken to the sepsis screening tool. The tool was triggered every time Lorna’s NEWS2 score was electronically recorded as higher than 5, or 3 in one vital sign. However, the tool was not completed until after sepsis treatment had been started by the medical team.

When Lorna was being cared for on the AAU, it was typically the healthcare assistant who took her observations. This was heard to be common practice across the hospital. The investigation found that the sepsis screen is only prompted for those who have a ‘registered nurse’, or similar, login on the handheld device. When healthcare assistants record vital signs that generate a high NEWS2 score, an alert appears. This advises them to escalate the high NEWS2 score to the nurse looking after the patient and consider whether this could be sepsis.

The investigation heard from the Trust that it is the responsibility of the registered nurse to carry out a sepsis screen, though as the investigation had previously heard, they are sometimes very busy with other tasks. The investigation heard from staff involved in the investigation that the AAU is a “super busy” unit that provides care to “a lot” of patients who have high NEWS2 scores, alongside patients who need more specialist care, such as specialist breathing support or heart monitoring. Lorna’s family recall that “no one was as poorly as mum” and therefore she “should have been a priority”. The AAU is staffed with one nurse and one healthcare assistant to each bay of 7 patients and a side room with one patient. The investigation heard from multiple staff that there is a focus on timely discharge from, and admission to, the AAU, which can add to the number of things to be done, and how quickly they are needed.

When the sepsis screen is prompted, the investigation found that the first question can be difficult for nursing staff to answer: 'does the patient have signs or symptoms of an infection?'. In Lorna's case, from 15:22 hours until 18:47 hours, when Lorna's NEWS2 scores were high but the cause and whether it was likely infection was uncertain, local policy sets the expectation that a sepsis screen is completed. Lorna's family remember that when they arrived at 17:30 hours, Lorna was "sweaty with freezing cold hands and feet which were very blotchy" and "was a grey yellow colour". They describe that she was "incoherent ... she was in intense pain" and that "it was clear" that she had an infection and "possible sepsis". During that time the results of blood tests taken earlier in the day were not yet available. The investigation found that without the results of blood tests, it is difficult to diagnose infection, and the possibility of a clot on Lorna's lung was not excluded until after her scan that afternoon.

The investigation heard from nursing staff involved in the process. They described reluctance to complete the sepsis screen without a confirmed diagnosis of infection from the doctor: "if it is query sepsis, or no one has mentioned about it, can I say 'yes'?". When this issue was discussed with staff responsible for sepsis across the hospital, it was described that nurses perceive the sepsis screen as a diagnostic tool. It was described that some staff considered the screen a "doctor thing" due to their perception of it as a diagnostic tool.

Area of improvement 3

Staff perceive that a diagnosis of infection is needed before completing the sepsis screening tool.

Team working arrangements to support care of the deteriorating patient

Lorna was reviewed by several staff, from different professional groups, while her condition was deteriorating. There were several instances during this time in which information about Lorna's condition was not received by staff who were best placed to respond, as defined in national guidance and local policy.

Escalation and handover of information are important tasks in the care of deteriorating patients. Alongside 'early detection', national guidance outlines 'timeliness' and 'clinical competence of the clinical response' as the three components that determine clinical outcomes for people with acute illness (Royal College of Physicians, 2017). Local and national guidance assigns responsibilities to staff working with patients who have a high NEWS2 score. Specifically, it outlines which team member the score should be escalated to, and how urgently.

From 15:22 hours onwards, Lorna's condition scored a NEWS2 of more than 7, which requires the most urgent clinical response. Local policy, supported by national guidance, recommends escalating to an 'ST3 [a senior doctor] or above ... for urgent review', and to 'contact critical care outreach team and request urgent review'. Further, local policy recommends to 'contact consultant responsible for the patient'. The investigation found that there was no senior oversight of Lorna's condition from 12:00 hours to 19:45 hours, when her case was discussed over the phone with a doctor at the level of ST3.

At the time Lorna's NEWS2 was first recognised to be high, her condition was escalated to the doctor looking after the patients in her bay. This doctor was more junior than ST3. The investigation heard from nursing staff about the process for escalating a patient who has a high NEWS2 score. It was heard that due to their physical presence on the unit, and the availability of their contact details, the doctors responsible for each bay of patients were the first to be escalated to. These doctors are typically more junior than an ST3 but have contact details for the senior doctor responsible for the unit, and the consultant.

The investigation heard that there is "not a problem" with escalating to doctors from staff caring for patients on the AAU, but that these were always the doctors looking after patients in the bay. There was little awareness among the nursing team for the need to escalate to a particular grade of doctor. In local practice, there is no direct escalation path from nurse to senior doctor or consultant.

The medical team involved in Lorna's care reflected that they would have expected a further escalation of Lorna's continued high NEWS2 score. This would prompt escalation within the medical team to the senior doctor. The investigation found this stepwise approach to escalation introduces the risk of information not being received by the people who are best placed to respond and introduces delay.

The investigation sought to understand why Lorna's care was not escalated again to the medical team when her NEWS2 score was 8, at 16:03 hours. This effort was limited by how much staff could remember events. It was reflected by staff involved in Lorna's care that she was being moved from the AAU for scans at the time her second high NEWS2 was recognised. She was away from the unit having a scan for approximately 1 hour. When she returned, Lorna was reviewed by the critical care outreach team who recognised that Lorna's blood pressure, which was previously a cause of her high NEWS2 score, was now within normal limits. Lorna's daughters remember the blood pressure alarms "continuously going off" and being told that their mum's blood pressure was "really low".

The investigation heard from one doctor about the importance of senior nursing oversight, and the benefits of this "making sure things get done and when they are required". On reviewing the national guidance, the investigation found no expectation of senior nursing oversight in NEWS2

clinical response. In local policy, the nurse in charge is expected to immediately assess a patient who has a NEWS2 score of 5 to 7. The expectation for patients who have a NEWS2 score of 7 and above to be reviewed by a senior nurse is not explicit within local policy.

Multiple staff told the investigation how busy the nurse looking after the bay typically is, and how this does not support the continuous care of deteriorating patients. On the day Lorna's condition deteriorated, the bay was described as "very, very busy" with clinical tasks "difficult to prioritise". Lorna's daughters remember "there was a senior nurse" who they "begged to give [Lorna] fluids" because she seemed "severely dehydrated". However, they felt that "nothing was done" to respond to their concerns or to respond to a blood pressure monitor, which was alarming, but "not doing anything".

The investigation heard that the nurse in charge of the AAU fulfils the role of a ward co-ordinator, with a focus on patient flow. It was described as a "very busy" role with a focus on the administrative tasks associated with discharge. Nursing staff on the AAU do not perceive the nurse in charge as a resource to support the care and treatment of patients whose condition is deteriorating, rather that they are there for support if the workload becomes unmanageable: "if you are overwhelmed you can ask them for help". The investigation heard from a senior nurse that it "wouldn't be routine" that nurses escalate high NEWS2 scores to the nurse in charge of this unit. Furthermore, they would "rely on the nurse [looking after the patient on the ward/unit] to ... action what has happened" and would not expect to be involved in the care of patients who are deteriorating "unless that nurse had concerns that she voiced [to the nurse in charge] ... about something the doctor has done or something she didn't understand".

The investigation found that this places an expectation of escalation and critical evaluation of the medical plan for patient deterioration on the nurse working within the bay, where national guidance directs this should be a senior or team approach.

Area of improvement 4

There are challenges in how tools and processes enable the care of deteriorating patients to be escalated to, and overseen by, senior medical and nursing staff.

The investigation discussed the role of the critical care outreach team with staff involved in the care of deteriorating patients, and those who provided care to Lorna. This team is not based on the hospital wards but visits patients who have a high NEWS2 score across the hospital.

The investigation also heard from the critical care outreach team about how they use NEWS2 scores to identify and prioritise patients for review. When a NEWS2 score of 5 or more (or 3 in a single vital sign) is generated, the patient is automatically added to the list of patients that team

plan to review. The lead for the team described difficulty prioritising patients for review as several patients may have similar NEWS2 scores. It is difficult to know who needs to be reviewed first, without further information from the nurse who is looking after the patient on the ward or unit.

The investigation heard that the critical care outreach team considers the location of the patient within the hospital when prioritising them for review, particularly if they are alerted to several patients with similar NEWS2 scores at the same time. On assessing where the patient is located, the team will consider how many doctors and nurses there are and what clinical skills and resources they have access to, meaning patients in an area with fewer highly skilled staff will be given higher priority. One representative of the team described the AAU as having “extended nursing skills” and that in terms of resources, they are “very well supplied ... compared to other areas”.

The investigation heard that staff across the hospital do not routinely call the critical care outreach team to provide a handover of the patient who has a high NEWS2 score as they know the patient has been automatically referred on the electronic record system. The investigation heard from staff on the unit that “the system would trigger, and they would be there” and the outreach team “automatically” know if a ward or unit has a patient with a high NEWS2 score.

The investigation found a consensus among nursing staff that was summarised by a senior nurse, who advised that critical care outreach “will come and recommend ... what should be implemented or what they recommend we should do”. This was different from the expectation of critical care outreach review as described by the lead for the team, who defined their input as “a quick end-of-bed assessment” to identify whether everything the nurses and doctors were reporting “match up with what we’re seeing in front of us”. If needed, they complete a “full ... assessment” to “actively review the patient”. This did not happen in Lorna’s case, because it was understood by the critical care outreach practitioner that “there was a robust plan in place”.

The investigation was unable to determine why the first critical care outreach review did not prompt further escalation or action. The investigation was unable to understand why this did not happen because the practitioner responsible was unavailable for discussion. On reflection of the case, a senior nurse in this area advised that the content of the critical care outreach review varies depending on “experience and confidence on whether you’re going to critique somebody else’s work and that it’s not easy to do”.

Area of improvement 5

There is variation in the understanding of the role of the critical care outreach team in managing the care and treatment of deteriorating patients.

Summary of findings, areas for improvement and safety actions

The investigation found that:

- Lorna did not show signs or symptoms of infection or sepsis while she was in the emergency department. These began to become apparent after she was admitted to the AAU and became more suggestive of sepsis when the results of blood tests and scans were made available.
- Lorna was more unwell on her admission to the AAU than staff realised. This was impacted by the additional score reflecting Lorna's need for oxygen to help her breathe not being included in her total NEWS2 score.
- Doctors in the AAU did not always have capacity to review patients in person. When Lorna's care was reviewed remotely the information available to the doctor was limited to the electronic record and verbal handover from the nurse.
- The design of the hospital's tool to support staff to escalate unwell patients led staff to leave out information that is not included in NEWS2 (such as how the patient 'seems'), which can limit staff's understanding of the patient's clinical condition.
- The nurse in charge of the AAU was not routinely involved with the care and escalation of deteriorating patients and there was no direct route of escalation from the nursing staff looking after the patient to a senior medical doctor or consultant.
- There was evidence to suggest Lorna became confused during her time on the AAU and this was not reflected in her NEWS2 score at any point. Staff reported difficulty understanding whether confusion is 'new'.
- Lorna's family expressed concerns that they were unable to advocate for her wellbeing and that their concerns about how unwell she was were not always heard.
- Nursing staff were reluctant to answer the first question of the sepsis screen – which asks 'does the patient have signs or symptoms of an infection?' – because they did not want to commit to a diagnosis if no infection had been identified.
- There is variation in the understanding between AAU staff and critical care outreach staff of what the critical care outreach team aim to do when they see a patient who has a high NEWS2 score.

Area of improvement 1

There is limited understanding and awareness of processes to support family and carer involvement in clinical decision making about deterioration.

Area of improvement 2

New confusion in patients is not consistently accounted for in NEWS2 scores.

Area of improvement 3

Staff perceive that a diagnosis of infection is needed before completing the sepsis screening tool.

Area of improvement 4

There are challenges in how tools and processes enable the care of deteriorating patients to be escalated to, and overseen by, senior medical and nursing staff.

Area of improvement 5

There is variation in the understanding of the role of the critical care outreach team in managing the care and treatment of deteriorating patients.

Appendices

Appendix 1: Terms of reference (ToR)

Incident/incident reference	(HSSIB)
Date agreed/version no.	3 April 2025
	26 June 2025

Date investigation is to be completed by	
Learning response lead	HSSIB
Staff engaged in the development of ToR	Staff interviewed were informed of the ToR but they were not directly developed with them HSSIB staff
Patient/family/carers engaged in the development of ToR	
Name	
Relationship	Daughter
Name	
Relationship	Daughter

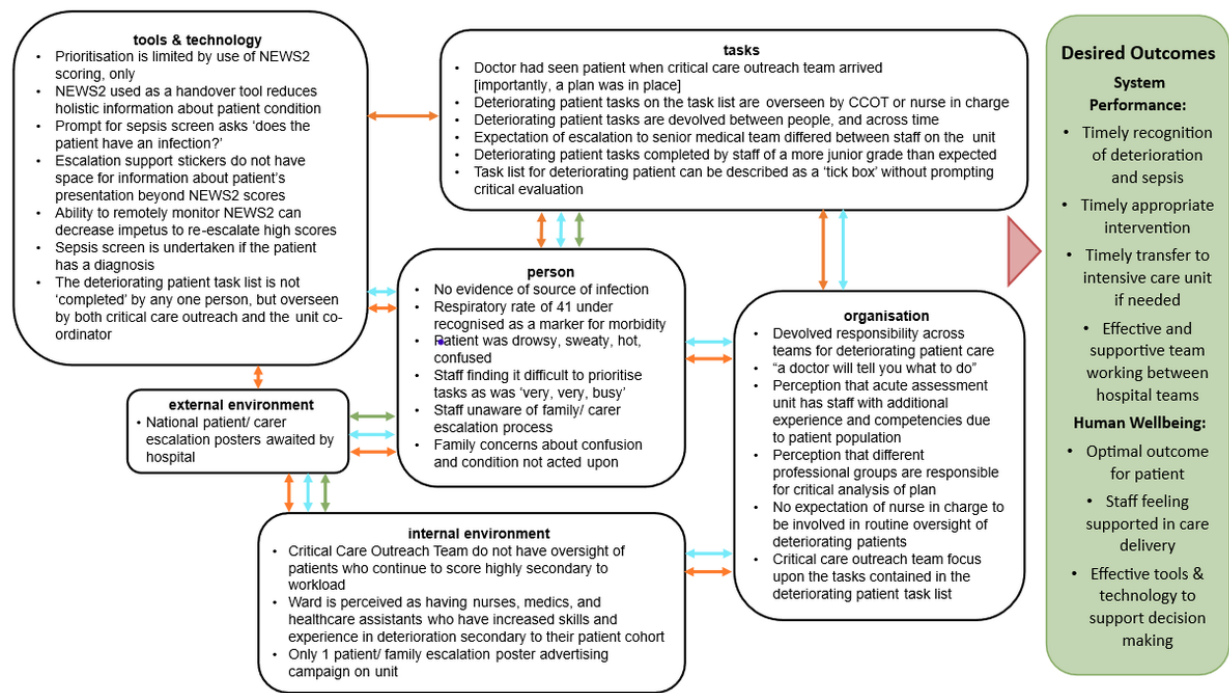
The investigation will:

ToR 1	Explore when and what signs and symptoms of sepsis Lorna had when she was in hospital
Key questions	List of questions to be asked to support the aim of the ToR: 1. Did Lorna's mental state, temperature, heart rate, blood pressure, respiratory rate, oxygen saturation or NEWS2 indicate her condition was worsening? 2. Did any tests taken indicate infection? 3. Are there any tools or prompts in place to support staff in recognising sepsis? 4. What was staffs' understanding about Lorna's risk of sepsis? What influenced that?
Healthcare settings	Key areas considered relevant to observe/interact with during the investigation: • emergency department • acute assessment unit.
Healthcare processes	Known processes that appear significant to consider within the investigation: • assessment and monitoring of Lorna – specifically NEWS2 and escalation • medical and surgical review of Lorna.

ToR 2	Explore factors that influenced staff response to signs that Lorna was becoming increasingly unwell
Key questions	List of questions to be asked to support the aim of the ToR: 1. What processes are in place to support staff in responding to a patient who is becoming increasingly unwell? 2. What safety risks are there with the current processes?
Healthcare settings	Key areas considered relevant to observe/interact with during the investigation: • acute medical assessment ward.
Healthcare processes	Known processes that appear significant to consider within the investigation: • critical care outreach response to high NEWS2 alert.

ToR 3	Identify opportunities for improvement in the timely recognition of sepsis
Key questions	List of questions to be asked to support the aim of the ToR: 1. What are the challenges to timely recognition of sepsis? 2. What mitigations exist currently? 3. Are there opportunities to re-design current processes to improve the response to the increasingly unwell patient?
Healthcare settings	Key areas considered relevant to observe/interact with during the investigation: • acute medical assessment ward.
Healthcare processess	Known processes that appear significant to consider within the investigation: • existing processes (medical, nursing, critical care outreach team) for responding to a high NEWS2.

Appendix 2: Systems Engineering Initiative for Patient Safety (SEIPS) framework



Appendix 2 key interactions

	Family concerns about Lorna's confusion and how unwell she was were not acted upon
	The utility of tools limited staff's ability to perceive how unwell Lorna was and to recognise the possibility of sepsis
	Team working arrangements impeded information about how unwell Lorna was being received by the right person, at the right time

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