The adult patient who is deteriorating: sharing learning from literature, incident reports and root cause analysis investigations

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About NHS Improvement

NHS Improvement is responsible for overseeing foundation trusts, NHS trusts and independent providers. We offer the support these providers need to give patients consistently safe, high quality, compassionate care within local health systems that are financially sustainable. By holding providers to account and, where necessary, intervening, we help the NHS to meet its short-term challenges and secure its future.

NHS Improvement is the operational name for the organisation that brings together Monitor, NHS Trust Development Authority, Patient Safety, the National Reporting and Learning System, the Advancing Change team and the Intensive Support Teams.
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1. **Introduction**

Failure to detect or act to prevent deterioration of the patient whose condition is amenable to treatment is still an area of harm that occurs in a wide range of acute clinical settings and is seen in adults and children. This report focuses on adult patients, the current pattern of harm and its causes to help improve future efforts in this area.

1.1 **Why is this a priority?**

Failure of healthcare staff to detect or act on the deteriorating patient can lead to delays in treatment (another high volume area seen in the weekly clinical review of death and severe harm incidents reported to the National Reporting and Learning System (NRLS)) that lead to further patient harm.

Of the death and severe harm incidents reported to the NRLS from acute hospitals between 1 January and 31 December 2015, 7% related to a failure to recognise or act on deterioration.

The Hogan et al study on preventable deaths (2012)\(^1\) found 26% of preventable deaths, using a very broad definition, related to failures in clinical monitoring. These included failure to set up systems, failure to respond to deterioration, and failure to act on test results.

Together the two data sources suggest failures in monitoring and failure to act on test results are a major source of serious harm and preventable deaths in hospital. As a result the patient safety team developed a workstream focused initially on the acute sector.

This resource focuses on the in-patient setting, and draws on research, incident reporting and investigations currently focused on the same setting. In the future it will be important to consider this topic in other areas including points of transfer of care and, where relevant, during transfer, and with a focus on all groups of healthcare staff. Given the low rate of reporting from primary care it may be that deterioration of a patient in a less acute setting also impacts adversely on the safety of the patient, either in the primary care setting or on their transfer to secondary/tertiary care.

1.2 **Our other new resources**

This resource supports our Patient Safety Alert ‘Resources to support safer care of the deteriorating patient (adults and children)’ issued 12 July 2016. We have also developed a resource with the Royal College of Paediatrics and Child Health on A safer system framework for recognising and responding to children at risk of deterioration.
2. **What can we learn from past national initiatives?**

In 2007 the National Patient Safety Agency (NPSA) carried out work based on a review of the 576 deaths reported to the NRLS in 2005/6. The review found that 424 of these had occurred in acute hospitals and revealed three key themes:

- diagnostic error (n=71)
- clinical deterioration not recognised or acted upon (n=64)
- problems with resuscitation after cardiopulmonary arrest (n=43).

Following further work on the topic the NPSA published:

- *Recognising and responding to early signs of deterioration in hospitalised patients*\(^2\)
- *The fifth report from the Patient Safety Observatory: Safer Care for the Acutely Ill Patient: learning from serious incidents PSO/05*\(^3\)

and (the then) National Institute for Health and Clinical Excellence (NICE) published:

- *Acutely ill patients in hospital: Recognition of and response to acute illness in adults in hospital.* \(^4\)

This was the first of the short clinical guidelines from the NICE Guideline Development Group recognising the importance of producing guidance rapidly in an area in which patients and clinicians need urgent advice to ensure the safety of patients.

The group considered that the configuration of response to the deteriorating patient should be agreed and delivered locally. It recommended:

- the measurement and recording of physiological observations, linked to a 'track and trigger' system
- tailoring written monitoring and management plans to the individual patient's clinical circumstances
- recognising the importance of training by ensuring staff have the necessary competencies to understand the clinical relevance of physiological observations so that care can be escalated appropriately
- avoiding transfer out of critical care areas between the hours of 22.00 and 07.00
• a formal, structured handover of care between the transferring and receiving teams.

In 2010 the topic of the deteriorating patient formed one of the ‘10 for 2010’ projects for the Patient safety division of the NPSA. The aims of the programme were to:

• support, promote and collaborate on development of standard criteria in patient assessment and monitoring to improve recognition and response to deterioration
• support reliable implementation of safer handover practice
• increase observation reliability
• promote national learning about causes and response to in-hospital cardiac arrest
• reduce the number of in-hospital cardiac arrests.

A further driver for this current workstream was the outcome of the Keogh reviews across 14 hospitals in England.² An extract from the report states “one consistent theme throughout almost all of the organisations reviewed was the management of complex deteriorating patients and the monitoring of Early Warning Scores”.

Examples taken from various trust reports on this topic include:

“…the lack of clear and formally agreed pathways for the recognition and management of acutely ill and deteriorating patients…”

“…lack of timely investigations and poor management of deteriorating patients”

“Ownership amongst medical staff for deteriorating patients overnight was unclear and patient at risk (PAR) escalation was not effective.”

“Clear issues were identified around clinical systems, for example, the new Early Warning Score was not taken up or universally understood.”

3. What can we learn from key guidance and literature?

The report of a working party of the Royal College of Physicians, National Early Warning Scores (NEWS): Standardising the assessment of acute-illness severity in the NHS,³ states that in relation to the deteriorating patient there are three critical elements that define clinical outcomes:

• early detection
• timely response
• competent clinical response.
This statement is supported by the findings of the NRLS review and the aggregate review of the root cause analysis (RCAs) detailed in this report.

A more recent 2011 overview of UK literature on the topic also supports the importance of this triad of elements, although less seems to have been published about the competency of clinical response than on the first two elements.

Guidance on acutely ill patients published in 2014 by the Scottish Intelligence Guidance Network (SIGN)\(^7\) made a number of recommendations around:

- observations
- the use of national early warning scores (NEWS)
- sepsis
- limited reversibility
- graded response
- communication
- data collection.

For physiological observations, SIGN recommends there should be a clear written monitoring plan stating which physiological observations should be done and how often, and that they should be performed by staff who understand their clinical relevance. The guidance also gives details on regular competency assessments for staff undertaking observations.

An April 2015 article in *Resuscitation* in April 2015 by DJ Silcock et al,\(^8\) which assessed validity of NEWS in unselected pre-hospital patients, found that an elevated NEWS score in this cohort is associated with a higher incidence of adverse outcomes. The study suggests that the calculation of pre-hospital NEWS can facilitate earlier recognition of the deteriorating patient, leading to earlier involvement of senior emergency department (ED) clinicians.

Odell\(^9\) describes the rapid response to the deteriorating patient in two phases:

- the afferent phase involving monitoring the patient, recognising deterioration and summoning assistance
- the efferent phase involving the expert teams assessing and treating the patient.

She found that the monitoring of patients by ward nurses had improved but problems persisted in scoring and adherence to referral protocols, especially outside 'normal working hours'. She concluded by acknowledging that non-compliance with protocols
is a large and complex issue involving several factors that need to be addressed to improve patient outcome and experience.

A study by Mukhal et al\textsuperscript{10} looking specifically at whether the NEWS was being used effectively to identify the deteriorating patient, found that in only 24\% of patients was it correctly scored and documented. In most cases escalation was to an inappropriate member of the team and the outcome of the medical review failed to produce a clear management plan for the patient.

Austen et al\textsuperscript{11} evaluated adherence to a local early warning system in two areas of an organisation, the emergency department (ED) and the acute assessment unit (AAU) to identify any potential obstacles to the consistent implementation of the NEWS. Using outcome measures of completeness of documentation and accuracy of aggregate scores, the study found that aggregate scores were documented for 66\% of ED and 84\% of AAU patients. In terms of accuracy of calculation, this was 73\% in ED patients and 79\% in AAU patients. In 95\% of both patient groups heart rate, blood pressure, respiratory rate, oxygen saturation and conscious levels were documented. Urine output was recorded for only 48\% of ED and 69\% of AAU patients. The study found that calculation errors were 11 times more likely to result in under-scoring rather than over-scoring.

Yiu et al,\textsuperscript{12} in a study on whether the clinical judgement of staff was affected by ‘alarm fatigue’, found that in a prospective review of patient records of 118 beds on 4 medical wards during 20 night shifts during 2,360 observed bed days, 109 patients triggered NEWS $\geq 6$ at least once during the observation period, but nursing staff only escalated 17\% of the patients. Almost all these patients had predefined chronic health conditions, with most fulfilling the criteria for frailty. Despite their higher 30-day mortality, patients with chronic obstructive pulmonary disease (COPD) had lower escalation rates. Furthermore, the study found that wards that had more patients with a NEWS $\geq 6$ had lower escalation rates.

A retrospective observational study of seasonally adjusted in-hospital mortality rates from three main hospital specialties across two acute general hospitals in England was done before, during and after the introduction of a hospital-wide electronic physiological surveillance system (EPPS). The EPPS replaced the paper-based vital sign charting. The study by Schmidt et al\textsuperscript{13} found that during implementation crude mortality fell: an estimated 397 fewer deaths in one hospital and 372 in the other hospital. At both sites multiyear statistical process control analyses revealed sustained mortality reductions that coincided with the deployment and increased use of the system, and the cumulative total of excess deaths reduced across all specialties with increasing use of the system across the hospitals. This supports the work of an earlier study by Jones et al,\textsuperscript{14} which found that EWS accuracy improved from 80\% to 100\% with electronic calculation, and clinical attendance to patients with an EWS of $>5$ increased from 67\% at baseline to 96\% with automatic alerts.
Fullerton et al\textsuperscript{15} found an improvement in clinical attendance to patients with EWS of 3, 4 or 5 to 78% with automated alerts from a baseline of 29%. They also found that clinical judgement alone is not very sensitive to critical illness in the pre-hospital environment and that EWS was a good indicator of critical illness detection.

Nwulu et al\textsuperscript{16} describe the adoption of an electronic observation charting function that can contact the critical care outreach team (CCOT) and clinical staff when a patient deteriorates. Data captured over a four-month period in a large English teaching hospital showed that although there were different levels of completeness between wards (from 69\% to 92\%), 80\% of observation sets were completed sufficiently to produce an EWS. During the pilot study there were 74 alerts to clinical staff and two critical alarms per day were emailed to the CCOT.

Chamberlain et al,\textsuperscript{17} also found an improvement in response to the deteriorating patient on the introduction of the NEWS along with a deteriorating patient pathway. A prospective analysis of 36 adult patients admitted to the critical care unit was done and then a further 36 admissions audited following the introduction of the NEWS and the deteriorating patient pathway. The study found a decrease in mean time to review by 1.3 hours, with more patients having consultant review. Furthermore, the highest NEWS on arrival of CCOT decreased from 5.25 to 4.35 with 94\% of patients having observations recorded at the correct frequency. The study found the deteriorating patient pathway was rarely used, suggesting that staff were either unaware of it or reluctant to instigate the pathway. Other areas that were poorly addressed were documentation of respiratory rate, urine output and decisions relating to cardiopulmonary resuscitation (CPR).

Kolic et al,\textsuperscript{18} in a prospective observational study of patients admitted to an acute medical ward of a district general hospital, found that the rate of incorrectly calculated NEWS scores had implications for the actions prescribed. In 18.9\% of patients, the score was incorrectly calculated with a worsening of the clinical response with an increasing score. The study also found that there was more likely to be an inadequate response if the patients were admitted at the weekend than during the week. Although there was small increase in inadequate NEWS responses at night, this was not found to be clinically or statistically significant.

This overview of the more recent literature appears to support the findings from both the aggregate RCA reviews and the NRLS data as detailed below.

4. **What can we learn from root cause analyses?**

Working with an opportunity sample of four NHS acute trusts 31 completed root cause analysis (RCA) investigations were reviewed and the results aggregated to determine any cross-cutting themes in the contributory factors.

The reviews were led by a head of patient safety from the NHS England Patient Safety Domain, supported by an experienced senior nurse working as quality lead
within NHS England and with a strong clinical background in critical care outreach nursing. The cases were reviewed at individual meetings within the trusts that lasted around four hours. At each meeting in the respective trusts one to two members of the patient safety/risk management team 'presented' the cases.

The inclusion/exclusion criteria applied to the selected cases were:

- only patients aged over 18 years were included
- only in-patients were included
- only incidents occurring within the past two years were included
- pregnant patients were excluded
- patients in critical care at the point of deterioration were excluded
- patients at end of life or with limited escalation of treatment before the episode of deterioration were excluded.

There were no inclusion criteria for severity of harm, ie not restricted to death or severe harm.

All the cases reviewed were paper-based systems, rather than electronic EWS systems.

After the reviews the results were collated and are summarised in the table below:

**Figure 1: Collation of results of the RCA reviews**

<table>
<thead>
<tr>
<th>Care delivery problem (CDP)</th>
<th>% of reports citing the listed CDP as a contributory factor</th>
<th>% of staff group involved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of reports</td>
<td>% of staff group</td>
</tr>
<tr>
<td></td>
<td>citing the</td>
<td>Medical</td>
</tr>
<tr>
<td></td>
<td>listed CDP</td>
<td></td>
</tr>
<tr>
<td>Failure to escalate a</td>
<td>65</td>
<td>6</td>
</tr>
<tr>
<td>triggering EWS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to undertake</td>
<td>48</td>
<td>83</td>
</tr>
<tr>
<td>observations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to instigate</td>
<td>45</td>
<td>62</td>
</tr>
<tr>
<td>appropriate treatment(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intra / cross team /</td>
<td>39</td>
<td>60</td>
</tr>
<tr>
<td>profession communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to confirm</td>
<td>35</td>
<td>67</td>
</tr>
<tr>
<td>diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to accurately</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>record observations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to accurately calculate EWS</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Failure of ongoing management</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Lack of clarity over identifiable senior responsible clinician</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Failure to evaluate response of interventions to deteriorating patient</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Lack of Level 1 facilities for patients who have a ceiling of care identified</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

The above headings are clearly very broad and worth exploring further at a local level to assess why observations are not accurately taken and recorded, and what types of communication failures are apparent in these circumstances. Another question these findings raise is why there is such a high failure to escalate rate, and whether this increases in relation to patients moving between different clinical areas and/or differences in EWS systems across the same organisation. The National Early Warning Score (NEWS) developed by the Royal College of Physicians is a well recognised system and is accompanied by an elearning tool.

In 16% of the above cases staffing levels was cited as a contributory factor.

Some of the participants in the aggregate review process raised further issues. Staff in one trust highlighted a shortage of observation equipment as contributing to inability to undertake timely observations. Further enquiry showed a frequent and significant shortage of equipment in clinical (particularly admission) areas; equipment shortages included oxygen saturation (Sao2) devices, thermometers and blood pressure machines. The trust found the ratio of observation equipment to patients was positively correlated with compliance with EWS frequency of observations in admission areas.

There are many advantages to electronic observations systems (e-EWS), but their initial use has also highlighted a reduced quality of handovers in some areas. This may be due to a reliance on the e-EWS to communicate information, including handover to CCOT members who rely on the handover to ascertain acuity and therefore prioritise workload.

It is difficult to state with precision in all cases where the problem developed, eg ward or emergency department (ED). However it appears that the problem first arose in the ward in 16 cases and in the ED in 15 cases, although in some cases the problem may have started in ED but progressed when the patient was on a ward.
Similarly it is not possible to state definitively whether the problem occurred during
the night or day, as in several cases both time periods are involved.

5. **What can we learn from NRLS data?**

It is important that local organisations review their own incident data in a regular and
systematic manner to extract learning that may be actionable across that
organisation.

The advantage of data analysis at a national level is that themes may be identified
from a larger dataset; furthermore, when linked with review of local investigations of
incidents it enables a more in-depth analysis of themes and trends.

Of the death and severe harm incidents reported to the NRLS from acute hospitals
between 1 January and 31 December 2015, 7% related to a failure to recognise or
act on deterioration. Of the 372 incidents, 208 had been categorised by the reporting
organisation as resulting in death and 164 in severe harm. The following table
summarises the main findings for the key clinical areas, in percentages.

Note that the failures to instigate appropriate treatments would only be a minority
where there were also aspects of failure to undertake observations or escalate.
Incidents where treatment error or delay was the sole factor would not be included in
this analysis as they would be themed as treatment error or delay.

**Figure 2: Summary of main findings of death and severe harm incidents
related to a failure to recognise or act on deterioration reported to the NRLS
January-December 2015, by key clinical areas**

<table>
<thead>
<tr>
<th>Summary of main finding</th>
<th>Ward</th>
<th>ED</th>
<th>Intensive Treatment Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to undertake observations</td>
<td>33</td>
<td>7</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Failure to escalate triggering EWS</td>
<td>31</td>
<td>5</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Failure to instigate appropriate treatments **</td>
<td>9</td>
<td>2</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

6. **Common themes for learning**

The findings in this learning summary really emphasise that the timely detection and
treatment of the deteriorating patient is a complex problem and, despite all the past
initiatives, we continue to see significant issues. It appears that the whole system needs to be looked at afresh to address this important patient safety issue.

It is clear that there cannot be one ‘quick-fix’ for addressing the timely detection and prompt, effective management of the deteriorating patient in every setting. Wherever improvement actions are under way it is important to ensure that a system-wide approach is taken. It is important that staff are competent in recording and understanding the clinical relevance of the physiological observations (appropriate to the level of care being provided). Furthermore, the most accurately and timely completion of an EWS will always require the systems behind it to ensure the findings are escalated promptly and to the correct level of clinical seniority; this includes organisations using electronic systems.

The systems designed must be understood by all groups and levels of seniority of the clinical staff involved in the care of the patient and not just by those who are the ‘experts’. To support and encourage this it is important that senior leaders in organisations critically analyse the systems and processes in their organisations concerning deterioration and sepsis, and ensure that initiatives to address these issues are closely aligned.

The findings from the pilot of the aggregate review of completed RCAs on the topic and the NRLS data support the view that the main areas that need to be addressed to improve the outcomes for patients are the failure to undertake observations or to escalate the findings to an appropriate level of seniority.

These findings are supported by much of the overview of the literature. It is clear that there are both local and national actions that can be taken to support these improvements in patient safety; these are set out below.

### 7. Suggestions for locally applying the learning

<table>
<thead>
<tr>
<th>Any work on this topic at trust level should:</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be underpinned by an understanding of the local context by using intelligence/insight from such sources as local incident and audit data as well as local RCA findings to support the prioritisation and focus of areas for attention</td>
<td>Using local sources will:</td>
</tr>
<tr>
<td></td>
<td>• help to identify and support prioritisation of specific high risk groups of patients and/or high risk points in the care pathway that need addressing</td>
</tr>
<tr>
<td></td>
<td>• enable meaningful measures to be made before and after improvement interventions</td>
</tr>
<tr>
<td>Include a review of all services for points of good practice that may be shared across services/organisations</td>
<td>There is significant learning to be gained from what has gone well as well as review of incidents and serious incidents</td>
</tr>
<tr>
<td>Develop local leaders from all key disciplines through education, communities of interest and peer support</td>
<td>Senior clinical leadership to oversee a system-wide approach to this topic is vital; furthermore, immense support can be gained from identifying local champions to help in the development and maintenance of communities of interest and play a major role in the identification of education needs</td>
</tr>
<tr>
<td>Provide competency-based training, tools, support and guidance to enable all frontline clinicians to develop/improve skills and knowledge in the use of the National Early Warning Score (NEWS), timely identification and treatment of the deteriorating patient. This should include a communication tool to escalate concerns between teams and professional groups and all training must be appropriate to grade</td>
<td>Failure to undertake observations, instigate appropriate treatment and escalate triggering NEWS were all implicated in a high number of the aggregate RCA reviews; this may be evidence of a lack of training and awareness</td>
</tr>
<tr>
<td>Training should include human factor elements such as the need to understand processes of deterioration and use of clinical acumen in addition to e-EWS for prompting escalation. There are resources such as the Royal College of Physicians NEWS e-learning tool as well as locally developed training</td>
<td></td>
</tr>
<tr>
<td>Identify opportunities to ensure family members are involved in contributing to the recognition of the deteriorating patient</td>
<td>Family members should be encouraged to report to a member of staff if they are at all concerned about a change in condition of their relative. Family members may be more aware of subtle changes in behaviour or responses that can signal deterioration. In some paediatric areas EWS systems apply a score for parental concern, and the principle is important for adults too</td>
</tr>
<tr>
<td>Support audit and assessment of available observation devices and develop action plan to address any shortfalls</td>
<td>Some areas reported a lack of available equipment as a contributory factor in observations not being taken or being performed at less than optimal intervals</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Support faster decision-making on determination of ceilings of care/escalation and accurate recording of same</td>
<td>Timely identification and communication of patients for limited or no escalation of care can enable adoption of more appropriate observation regimes and avoid unnecessary and inappropriate emergency call situations.</td>
</tr>
<tr>
<td>Encourage increased use of ‘point of care testing’ (POCT); this is particularly relevant in pre-hospital settings.</td>
<td>Appropriate use of this type of technology can reduce the reliance on some laboratory tests and facilitate earlier diagnosis of certain conditions. This can support timely pre-alerting to hospitals in out-of-hospital situations and also enable the start of elements of treatment regimen.</td>
</tr>
<tr>
<td>Support the consideration and evaluation of the benefit of adopting electronic EWS system and automated systems to summon relevant responders in line with local escalation pathways</td>
<td>A number of articles reviewed (see summary of evidence) observed significant improvements in recording and escalation of observations with an electronic EWS system when compared with paper based systems.</td>
</tr>
<tr>
<td>Consider the need to incorporate a situation, background, assessment, recommendation (SBAR) tool to e-EWS for all high scoring patients</td>
<td>Intra/cross team communication failure was mentioned as a problem in 39% of the aggregate RCA cases. A systematic and well-understood communication process is also important when using an electronic system.</td>
</tr>
</tbody>
</table>

**8. Commissioners of care and their influence**

It is vital that commissioners of care are an integral part of this work. Their knowledge of aspects of patient safety is critical if they are to be supported to commission high quality care that supports the timely and effective detection and treatment of the deteriorating patient. For this particular clinical issue commissioners may benefit from:
• a broad focus on assuring providers patient safety systems and culture and the impact this has on the topic of the detection and management of the deteriorating patient

• understanding some of the perceived barriers to the timely and effective detection and treatment of the deteriorating patient, as may be gleaned from local incident and serious incident reports

• appropriate selection of locally determined commissioning levers for patient safety so that they have maximum impact

• ensuring there is systematic consideration of patient safety implications when initiating service reconfigurations, including new service models as envisaged by the NHS England Five Year Forward View (5YFV).  

A driver diagram outlining some suggested areas to address can be found in Appendix 2. A driver diagram is an improvement tool that helps translate a high level improvement goal into a practical set of actions that together contribute the essential steps in attaining the goal. This offers one way of outlining what a whole system framework may look like. The secondary drivers in the diagram can be expanded/amended to fit local circumstances, based on, for example, intelligence from local incident and audit data, as well as local RCA findings. This will give organisations some latitude to address their local priorities within the broad outline of a system-wide framework. It is important to acknowledge that a driver diagram is a ‘live’ tool and will therefore necessarily change as aspects of the overall goal are addressed.

9. Integrating sepsis and deterioration workstreams

The report of the Parliamentary and Health Ombudsman (2013) Time to Act Severe sepsis: rapid diagnosis and treatment saves lives recommended NHS England prioritise a workstream on clinical deterioration, including the early recognition of sepsis. The report highlighted the death of patients in the NHS after failure to diagnose and rapidly treat sepsis.

In addition, the growing national concern of organisations such as the UK Sepsis Trust has helped to bring to light the harm caused by the lack of timely recognition and treatment of sepsis. According to the UK Sepsis Trust, an estimated 35,000 people will die of sepsis each year. There is also a strong sense, driven by clinicians, of a need for a national focus on and priority for the improvement of outcomes in the recognition and treatment of sepsis.

In 2014/15, 8% of incidents reported from acute trusts to the NLRS as causing severe harm or death related to a failure to recognise or act on clinical deterioration. Some of these will relate to sepsis but sepsis is under recognised and therefore very likely to be under reported.
The sepsis element of the deterioration work programme endeavoured to improve the recognition and treatment of the patient who is confirmed as, or suspected of, having sepsis. A key objective is to ensure that clinicians are equipped to recognise and treat patients with sepsis as a medical emergency. The benefits include:

- reduction of avoidable harm and death
- greater awareness by clinicians of sepsis as a medical emergency through the use of a campaign model
- patient and parent participation to support the case for change, such as the use of stories
- sharing best practice through the spread of initiatives/improvement work
- working in partnership with the UK Sepsis Trust and other organisations
- an increase of resources and guidance available to commissioners
- greater use of commissioning levers and incentives, eg CQUINs.
### Appendix 1: Driver diagram

**Outcome:** A system framework that promotes the improved recognition and appropriate response to clinical deterioration.

<table>
<thead>
<tr>
<th>Primary driver</th>
<th>Secondary driver</th>
</tr>
</thead>
</table>
| Embed a generative patient safety culture in all levels of services | - Patient safety leadership  
- Safety briefing and debriefing models |
| Understand the local context of the problem of failure to recognise and respond to the deteriorating patient to support the prioritisation and focus of areas for attention | - Use intelligence/insight from local incident and audit data as well as local RCA findings  
- Identification of learning points from examples of good practice |
| Increase early recognition of deterioration in patients whose condition is amenable to treatment by use of National Early Warning Score (NEWS) | - Improve reliability and accuracy of patient observations  
- Increase use of tools (including electronic) to improve recognition and response  
- Careful documentation and communication to support prompt identification of patients who have ceilings of escalation of care in place |
| Clear escalation channels and response frameworks for patients at risk of deterioration | - Structured escalation protocol to include standardisation of emergency contact numbers to use  
- Response protocols (Review, RRT, MET, Transfer)  
- Condition-specific response (obstetrics and mental health including during manual restraint) |
| Clear and well-understood communication principles | - Non-hierarchical communications  
- Widespread implementation of structured communications (eg SBAR)  
- Improved clinical handover |
| Identification of specific high risk groups | - Post interventional procedures  
- Patients with suspected sepsis Neutropenic patients |
| Identification of high risk points in care pathway | • At communication/handover points between staff/teams  
• Patients ‘outlied’ to non-specialist clinical areas |
| Accessible and relevant training/education opportunities to support and guide frontline clinicians | • Identify local leaders/champions  
• Review current training capability  
• Structured training and education for all professional groups of clinical staff  
• Support measurement of improvement  
• Work with regional/national leads and initiatives (eg Sign up to Safety; Academic Health Science Networks and Patient Safety Collaboratives) to promote interventions |
| Support patient and family members to recognise and respond to deterioration | • Patient, family and carer engagement in individual care decisions  
• Patient, family and carer engagement in delivering improvement activities |
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