Health Services Safety Investigations Body

Investigation report

Investigation report: Early warning scores to detect deterioration in COVID-19 inpatients

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Theme:
Hospital care,Coronavirus (COVID-19)

Contents

Executive Summary

This national intelligence report provides an insight into a current safety risk that the Healthcare Safety Investigation Branch (HSIB) has identified.

Background: A safety risk was identified based on a referral to HSIB. The referral was about difficulties in identifying clinical deterioration in patients with COVID-19 on general wards.

Purpose: The Royal College of Physicians (RCP) is responsible for the development of early warning scores for clinical deterioration and this report documents how concerns raised by HSIB were responded to.

Intended outcome

HSIB notes the following safety action

> **Safety action A/2020/032**
>
> The Royal College of Physicians has highlighted the issue of rapid deterioration in oxygenation in patients with COVID-19 and how this might relate to the use of early warning scores.

Outcome: The RCP released a statement on its website relating to revised guidance on the use of early warning scores for COVID-19 inpatients. The RCP suggest that all staff should be aware that any increase in oxygen requirements should be an indicator of clinical deterioration as the early warning score might not significantly increase.

Healthcare system goal

To closely monitor inpatients with COVID-19 for signs of clinical deterioration, such as rapidly progressive respiratory failure, and respond immediately with supportive care interventions (World Health Organization, 2020).

Background

The World Health Organization (2020) recommends that ‘patients hospitalised with COVID-19 require regular monitoring of vital signs and, where possible, utilisation of medical early warning scores that facilitate early recognition and escalation of treatment of the deteriorating patient’.

An early warning score is a guide used by clinicians to help alert them to potential deterioration in a patient's condition. It is represented by a numerical value. Early warning scores should be used alongside clinical judgement to help identify the severity of a patient's illness and the risk of their condition deteriorating. However, a national investigation by HSIB (2019) found that staff could have been falsely reassured by early warning scores when working in a busy and complex environment.

Details of referral/reference event

In response to COVID-19, HSIB received a referral highlighting that a number of NHS trusts were using early warning scores for risk-stratification on admission, and to detect clinical deterioration when a patient was admitted to a general ward with suspected or confirmed COVID-19. The referral suggested an over reliance on early warning scores, which were being used in isolation from other indicators of deterioration.

It is important to monitor patients with COVID-19 for signs of deterioration; if their condition deteriorates treatment may need to be escalated - including the need to be transferred to an intensive care unit (ICU)/critical care. Instances have been reported where an over reliance on early warning scores on general wards resulted in delayed escalation of patients with COVID-19.

- In response to COVID-19, general wards were typically not staffed by respiratory specialists and consequently early warning scores were being relied upon for escalation decision making. This was problematic given that early warning scores should be used alongside appropriate clinical judgement.
- HSIB was made aware that some NHS trusts were exclusively training reassigned staff in the use of early warning scores as a means to track deterioration in COVID-19 patients, without consideration of other markers of deterioration. The availability of clinicians with the prerequisite 'clinical judgement' expertise was limited.
- Staff who were less familiar with managing acute medical patients were sometimes falsely reassured by no change or additional change in early warning score.
    - NEWS2 is the latest version of the National Early Warning Score (NEWS), which was first produced in 2012 and updated in December 2017. It is a 'track and trigger' tool which produces a composite score based on physiological measures to detect deterioration in a patient's condition, and aims to standardise the assessment of, and response to, acute illness.

NEWS2 has received formal endorsement from NHS England and NHS Improvement to become the early warning system for identifying acutely ill patients (Royal College of Physicians, 2017).

- If a patient's oxygen requirements increase over a short period of time, as a result of a reduction in oxygen saturation (the amount of oxygen absorbed into the blood), this might not change the NEWS2 score if other parameters remain unchanged. HSIB received a report that one patient's oxygen saturation significantly reduced within a period of half an hour, but this did not change their NEWS2 score. Escalation was required in the absence of an additional NEWS2 trigger, but this did not happen in a timely way.
- It has also been reported to HSIB that patients with COVID-19 who deteriorate, requiring rescue or consideration of critical care, have often already triggered on NEWS2 (with a score of five or more) and the deterioration is often as a consequence of increasing oxygen requirements. This may not lead to an additional increase in the NEWS2 score.
- Rapidly increasing oxygen requirements is a condition-specific trigger for COVID-19 that should inform clinical judgement regarding the need for escalation.

Intelligence

HSIB evaluated this safety risk against its national investigation criteria and the need for a rapid safety action was identified. All safety risks that HSIB considers for investigation are evaluated in this way.

Systemic risk – How widespread and how common is the safety issue across the healthcare system?

The prevalent indicator of deterioration in COVID-19 patients, and the likely trigger for escalation to ICU/critical care, is a sudden drop in a patient's oxygen saturations or a sudden increase in oxygen requirements to maintain acceptable saturations; this can happen within an hour. Although it is estimated that about 30 to 50% of COVID-19 patients have chronic comorbidities (co-existing long-term conditions) (Xie et al., 2020), many patients who went on to develop respiratory failure had hypoxemia (abnormally low levels of oxygen in the blood) but without signs of respiratory distress – a phenomenon known as 'silent hypoxemia'. This was particularly the case in elderly patients.

Studies of patient deterioration have demonstrated the benefits of early warning scores to identify patients at risk of deterioration in addition to clinical judgement and condition specific measures (Smith et al., 2016; Bilben et al., 2016). It is important to note that staff concern is an equally important reason for escalation and must be encouraged as part of patient monitoring.

The early warning scoring approach, with clear thresholds for escalation, is thought to work well in settings with nursing staff who undertake the first layer of monitoring. However, an evaluation study on the general use of early warning systems found that staff clinical concern, in the absence of a threshold qualifying score, was responsible for escalation in 47% of cases (McGaughey et al., 2017).

Outcome impact – What impact does the safety issue have on people and services across the healthcare system?

COVID-19 is a pandemic. COVID-19 case fatality rates vary from 1% to more than 7%, but these values must be interpreted with caution. In countries with large-scale screening, overall case fatality rates of less than 1% have been reported (Vincent and Taccone, 2020).

Learning potential – What is the potential for an HSIB investigation to drive positive change and improve patient safety?

Irrespective of which type of early warning system is used, there are risks around how the scoring is being implemented in practice. Monitoring the deterioration of patients on COVID-19 general wards is challenging due to the skill mix of reassigned staff and likely lack of respiratory specialists, who more often will be working in ICU/critical care. Therefore, a more complex early warning score involving blood tests and less familiar diagnostic parameters is likely to be difficult to implement due to the availability of resources and expertise.

It has been found that the utility of early warning systems is dependent on experienced nursing staff using clinical judgement to recognise patient deterioration, and the score being a way of empowering calls for help (McGaughey et al., 2017). Factors such as ward culture, workload and staffing have a significant impact on the utility of early warning scoring systems.

Further evaluation on the use of early warning systems during crisis scenarios is warranted. The possibility of over reliance on physiological scoring systems amongst less experienced staff should be included in these evaluations.

Response to HSIB’s concerns

HSIB notes the following safety action

Safety action A/2020/032

The Royal College of Physicians has highlighted the issue of rapid deterioration in oxygenation in patients with COVID-19 and how this might relate to the use of early warning scores.

The Royal College of Physicians (RCP) is responsible for the development of NEWS2 and responded to HSIB's concerns. On 14 April 2020 the RCP released a statement on its website relating to revised guidance on the use of NEWS2 for COVID-19 inpatients (Royal College of Physicians, 2020). In this statement the RCP suggests that all staff should be aware that any increase in oxygen requirements should trigger an escalation call as the NEWS2 score might not significantly increase. The statement was formulated based on the experience of the RCP's clinical advisors and their networks in managing patients with COVID-19. The RCP was grateful to HSIB for also contacting them about the issue of rapid deterioration in oxygenation in patients with COVID-19 and how this might relate to NEWS2.

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