

# BMJ Open Quality Targeted communication reduces the inappropriate use of Early Warning Scores in patients with treatment limitations

Clara Green ,<sup>1</sup> Urwah Ahmed ,<sup>2</sup> Rahul Mukherjee <sup>3</sup>

**To cite:** Green C, Ahmed U, Mukherjee R. Targeted communication reduces the inappropriate use of Early Warning Scores in patients with treatment limitations. *BMJ Open Quality* 2022;**11**:e001503. doi:10.1136/bmjopen-2021-001503

Received 22 March 2021  
Accepted 20 December 2021

## INTRODUCTION

Early Warning Scores (EWSs) use physiological parameters to create an aggregate score alerting medical teams to patient deterioration, triggering referrals to critical care regardless of chronic health issues and physiological reserve.<sup>1 2</sup> Consequently, in some patients with persistently altered physiology or patients who are not deemed suitable for escalation to critical care, EWS can be inappropriate resulting in the overmonitoring of patients and inappropriate contact of critical care.<sup>2 3</sup> Guidelines state that in such circumstances routine recording of EWS can be stopped.<sup>2</sup>

In our trust, end-of-life care patients were monitored according to EWS resulting in the inappropriate call out of critical care. For example, critical care teams were called to assess patients where a decision not to escalate to critical care had previously been documented. Nursing staff reported that monitoring according to EWS increased workload limiting their ability to achieve other tasks resulting in patient stress.

We, therefore, sought to determine the proportion of patients with treatment limitations in place who had these limitations documented on their EWS chart.

## METHODS

We performed two snapshot audits on acute medical (control) and general medical wards (intervention) to obtain the percentage of patients with treatment limitations in place who had this documented on their EWS charts before and after improvement measures. First, a paper prompt on the EWS chart. Second, targeted communication interventions to general medical wards only. Targeted communication was not repeated after the second audit. A third snapshot audit was completed a year after improvement measures

in order to identify whether improvements were sustained. As the decision to use a paper prompt was initiated by the trust and the second intervention was communication to follow existing guidance<sup>2</sup> this study did not require ethical approval but was registered at our Trust as an audit (registration no. 4474).

## Setting

Acute medical (control) and general medical (intervention) wards in a large District General Hospital between 2018 and 2020.

## Target population

Patients with treatment limitations identified through review of notes.

## Interventions

First intervention (control and intervention wards): paper prompt on the EWS chart. Second intervention (intervention ward only): targeted communication consisting of announcements at departmental meetings and emails to consultants and senior ward nurses. Nurses were asked to highlight patients during ward rounds that might be inappropriate for EWS. These interventions had previously been shown to be effective.<sup>4 5</sup>

## Outcome

The proportion of patients with treatment limitations that were monitored appropriately by EWS. (Monitoring includes recording observations on the EWS chart and the response to this including observation frequency and contact of other health professionals.) We considered patients were being monitored appropriately if their limitations were documented on their EWS charts. This documentation varied between patients. Some patients at the end of life were not suitable for EWS monitoring. Other patients required alteration of response to EWS score; for example, to not call critical care.



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

<sup>1</sup>Institute of Inflammation and Aging, University of Birmingham, Birmingham, UK

<sup>2</sup>Dept. of Respiratory Medicine, Birmingham Heartlands Hospital, Birmingham, UK

<sup>3</sup>Institute of Clinical Sciences, University of Birmingham, Birmingham, UK

## Correspondence to

Dr Rahul Mukherjee;  
r.mukherjee@bham.ac.uk

### Three audits

2018 (preintervention), 2019 (directly postintervention), 2020 (1 year follow-up—intervention ward only). Targeted communication was not repeated after 2019. Medical and nursing staff were not informed about audit timing.

All patients on the target wards were reviewed during each audit. Audit 2018 occurred over 3 days in November–December. Audit 2019 occurred over 8 days in June–September. Audit 2020 occurred over 2 days in August–September.

We obtained qualitative feedback from nurses and physiotherapists by discussion at departmental meetings throughout the study.

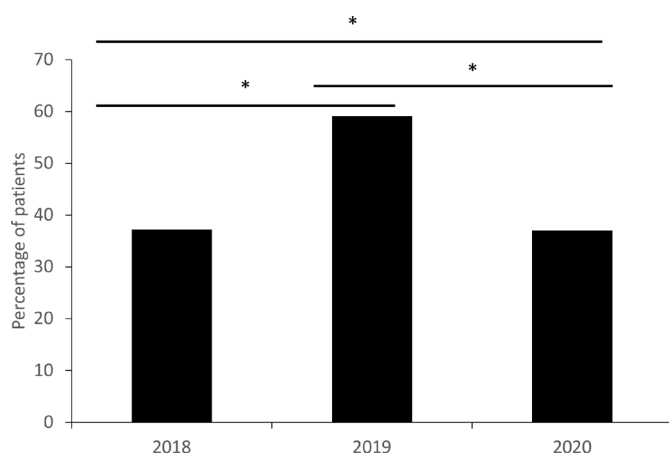
$\chi^2$  test was used (SPSS V.24) for statistical analysis. Results were considered significant when  $p < 0.05$ .

## RESULTS

### Audit results

There was no significant difference in the proportion of patients with treatment limitations that had these documented on the EWS chart between 2018 and 2019 (12/21 (57.1%) vs 12/32 (37.5%),  $p = 0.160$ ) in the ward where only a paper prompt was used. However, where targeted communication was used, there was a statistically significant improvement (16/43 (37.2%) vs 55/93 (59.1%),  $p = 0.017$ ).

In 2020, 10/27 (37%) patients with treatment escalation limitation decisions in wards where targeted



**Figure 1** Patients with treatment limitations in place on general medical wards (where targeted communication was used) who had these limitations documented on their EWS charts in 2018, 2019 and 2020. There was a significant difference in the percentage of patients with treatment limitations documented on their EWS chart across the three audits. Significantly more patients with limitations in place had this documented on their EWS charts in 2019 in comparison with 2018 and 2020. Horizontal lines are used to illustrate which groups were compared in the chi squared test. \*There was a significant difference between the proportion of patients with treatment limitations documented on the EWS chart between groups where  $p < 0.05$ . EWS, Early Warning Score.

communication had been used had these documented on their EWS charts (figure 1). This was significantly ( $p = 0.042$ ) worse than the previous (2019) audit.

### Qualitative feedback

#### September 2019

Nursing staff identified that multiple patients were over-monitored and they offered to help by prompting doctors to think about appropriateness of EWS.

#### November 2019

Band 5 physiotherapists and ward nurses overwhelmingly welcomed stopping inappropriate EWS.

#### October 2020

Ward managers and matrons stated that nurses feel it aids their communication with patients and families when treatment escalation limitation decisions are made and documented.

## DISCUSSION

Our results indicate that the proportion of inpatients with treatment escalation and limitation decisions in place that have their EWS amended can be improved by targeted communication. Paper prompts alone are not sufficient. These findings are in contrast to a Cochrane review that concluded that manually generated paper reminders have a small but significant effect on outcomes.<sup>4</sup>

Other studies have demonstrated the effectiveness of targeted communication.<sup>5</sup> It is likely that an effective tool in our study was nursing team involvement who frequently prompted medical staff. Nurse-driven prompts have previously been demonstrated to be effective at improving concordance of physicians to guidelines.<sup>6</sup> However, our results demonstrate that sustained change requires continuous education, communication and reminders consistent with previous studies.<sup>5</sup>

In this study, the nursing team were positive about the improvements in workload when EWS was reviewed. High nursing workload prevents optimal patient care by reducing time to communicate.<sup>7</sup> This is particularly relevant in patients receiving end-of-life care.<sup>8</sup> Furthermore, restricted visiting policies during the COVID-19 pandemic make it important that stretched NHS resources of time and personnel required for inappropriate EWS scoring should be better utilised in providing palliative support.<sup>9</sup> Previously, nurses' pattern recognition has been shown to detect acute deterioration.<sup>10</sup> Therefore, nursing impressions may be a less disruptive way to monitor patients with treatment limitations than EWS.

### Limitations

This study was small and was carried out in a single centre which might limit generalisability. However, data were collected on general medical wards found in most hospitals and the interventions could be replicated in most healthcare settings.

Data were collected using ‘snapshot’ style audits and represents three points in time. Nevertheless, this enabled us to collect data quickly and we were able to limit bias as staff were not aware of audit timings.

## Conclusions

A large proportion of patients with treatment escalation limitations are still regularly being assessed using EWS despite not being suitable for escalation to critical care. This places unnecessary workload on staff and distresses patients. Targeted communication is an effective tool to prompt staff to address EWS measuring but this needs regular repetition.

**Twitter** Clara Green @ClaraEGreen and Rahul Mukherjee @rationalmed

**Acknowledgements** We would like to thank the medical staff who assisted with this project at Birmingham Heartlands Hospital: Dr Saleem Chaudhri, Dr Christopher Peet, Dr Ambreen Sadiq and Dr Samuel Strain.

**Contributors** CG and UA collected the data, analysed the data and wrote the manuscript. RM performed the interventions stated in the study, supervised the project and revised the manuscript.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Ethics approval** No ethical approval was required to carry out this project. The decision to switch from the modified Early Warning Score (MEWS) to the National Early Warning Score 2 (NEWS2) was made by the trust and not the study authors.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially,

and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

## ORCID iDs

Clara Green <http://orcid.org/0000-0002-4210-8285>

Urwah Ahmed <http://orcid.org/0000-0002-3016-4802>

Rahul Mukherjee <http://orcid.org/0000-0003-4466-0660>

## REFERENCES

- 1 Smith GB, Prytherch DR, Meredith P, *et al*. The ability of the National early warning score (news) to discriminate patients at risk of early cardiac arrest, unanticipated intensive care unit admission, and death. *Resuscitation* 2013;84:465–70.
- 2 RCP. Royal College of physicians. National early warning score (news) 2: standardising the assessment of acute-illness severity in the NHS. Updated report of a working Party. London: RCP, 2017.
- 3 Hope J, Recio-Saucedo A, Fogg C, *et al*. A fundamental conflict of care: nurses' accounts of balancing patients' sleep with taking vital sign observations at night. *J Clin Nurs* 2018;27:1860–71.
- 4 Pantoja T, Grimshaw JM, Colomer N, *et al*. Manually-generated reminders delivered on paper: effects on professional practice and patient outcomes. *Cochrane Database Syst Rev* 2019;12:Cd001174.
- 5 Conaty O, Gaughan L, Downey C, *et al*. An interdisciplinary approach to improve surgical antimicrobial prophylaxis. *Int J Health Care Qual Assur* 2018;31:162–72.
- 6 Raybardhan S, Kan T, Chung B, *et al*. Nurse Prompting for Prescriber-Led review of antimicrobial use in the critical care unit. *Am J Crit Care* 2020;29:71–6.
- 7 Martin-Ferrer ML, De Juan Pardo María Ángeles, Bardallo Porras D, *et al*. An ethnographic study of human dignity in nursing practice. *Nurs Outlook* 2019;67:393–403.
- 8 Johnston B, Pringle J, Gaffney M, *et al*. The dignified approach to care: a pilot study using the patient dignity question as an intervention to enhance dignity and person-centred care for people with palliative care needs in the acute hospital setting. *BMC Palliat Care* 2015;14:9.
- 9 Coulter A, Richards T. Care during covid-19 must be humane and person centred. *BMJ* 2020;370:m3483.
- 10 Romero-Brufau S, Gaines K, Nicolas CT, *et al*. The fifth vital sign? nurse worry predicts inpatient deterioration within 24 hours. *JAMIA Open* 2019;2:465–70.