NICE National Institute for Health and Care Excellence

Appendix B: Stakeholder consultation comments table

2020 surveillance of Acutely ill adults in hospital: recognising and responding to deterioration (2007)

Consultation dates: 14 November to 27 November 2019

1. Do you agree with the proposal to not update the guideline?			
Stakeholder	**Overall response**	**Comments**	**NICE response**
Bedfordshire and Luton Fair Play	Yes	No comment	Thank you for your response. We note that you agree with the proposal to not update the guideline. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.
British Geriatrics Society	Yes	No comment	Thank you for your response. We note that you agree with the proposal to not update the guideline. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.
NHS England and NHS Improvement	No	We are very grateful for the terrific work NICE has done with this guidance.	Thank you for your response. We note that you disagree with the proposal to not update the guideline and that you believe that this guideline should be updated to include up to date evidence and indicate support for the NEWS2 tool.

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		We strongly believe that revision of the NICE guidance is required, updated to reflect up to date evidence and to indicate support for NEWS2. There is a risk that if the deterioration guidance is not revised, that NICE will be perceived as being further 'out of touch' with front line clinical practice, organisational, academic and expert patient perception and mirror what has happened with NICE NG51 sepsis. There are key factors that NICE needs to consider prior to this decision: • What is actually already happening in all acute hospitals and ambulances across the country. It is very clear that standardisation favours the safety within the system as a whole. The front line and academic belief strongly favours NEWS, with 75% of trusts voluntarily implementing NEWS since 2012, and now with the update to NEWS2 this now sits close to 100%. This exemplifies that clinicians use the best available systems, use guidance that is relevant, pragmatic, and, to their perception, has the best evidence. • What is evolving (with NEWS2), nationally, in all non acute settings across the healthcare pathway and the opportunities therein. • The opportunity to standardise to NEWS2 in all care settings, reduces the dangers of staff moving jobs and having to 'learn' a new deterioration system wherever they work. • What current research demonstrates: there has been exponential growth of papers/research in deterioration over the last 5 years and the apparent findings that NEWS is the best & most effective EWS and that aggregate scores are	In NICE surveillance reviews we take care to consider a range of sources of evidence and engage with a wide range of stakeholders to determine whether our guidelines require updating, with the aim of maximising the relevance and value of our guidance. As part of this surveillance review, we performed searches to identify up to date evidence on parts of the guideline suggested by topic experts. These searches were conducted in July 2019. As a result, this surveillance review has included up to date evidence relevant to this guideline and we have presented these findings in the summary of evidence. As noted in the summary of evidence, only limited comparative studies were identified for NEWS2 and so we concluded that further evidence is required to sufficiently demonstrate superior performance of NEWS2 compared with other available tools. Your comment includes citations for several published studies. Thank you for forwarding details of these studies. We have carefully considered the eligibility of each of these below. Some of these studies had already been included in the surveillance review. These include: • Hogan *et al.* (2019) (numbered in your comment as reference 1). • Smith *et al.* (2016) (numbered in your comment as reference 11) Some of your suggested studies were specific to sepsis. As noted in our consultation document, evidence specific to sepsis was not summarised in this surveillance review as this is covered by the NICE related guideline on sepsis: recognition, diagnosis and early management (NG51). For this reason, the following studies suggested in your comment (which were already identified by

		better than single extreme parameter systems (e.g. MET criteria) • What all other national bodies are recommending Royal colleges, NHS England and NHS Improvement, Societies, CQC, coroners societies, charities and other expert bodies all recommend NEWS2, and will be producing deterioration guidance based on NEWS2 in due course. There is a risk that these guidances (rather than NICE) will be widely utilised and referenced in regard to evidence around deterioration going forwards. There have been a lot of new studies that add further weight to the benefits around NEWS- these are a few examples from the last couple of months. 1. NIHR study Mixed methods study looking at the impact of EWS (and NEWS) in acute hospitals in England https://njl-admin.nihr.ac.uk/document/download/2021913 2. Comparison of NEWS v qSOFA in infected/non infected patients https://www.ncbi.nlm.nih.gov/pubmed/29467173 3. Accuracy of National Early Warning Score 2 (NEWS2) in Prehospital Triage on In-Hospital Early Mortality: A Multi-Center Observational Prospective Cohort Study. Martín-Rodríguez et al.; Prehospital and disaster medicine; Oct 2019 ; p. 1-9 4. Four early warning scores predict mortality in emergency surgical patients at University Teaching Hospital, Lusaka: a prospective observational study. Author(s): Foy, Katie Ellen; Pearson, Janaki; Kettley, Laura; Lal, Niharika; Blackwood, Holly; Bould, M Dylan Source: Canadian journal of anaesthesia = Journal canadien d'anesthesie; Oct 2019	searches in this surveillance review) were not considered eligible for inclusion in the summary of evidence in this surveillance review: • Goulden *et al.* (2018) (numbered in your comment as reference 2). • Churpek *et al.* (2017) (numbered in your comment as reference 12) Some studies suggested in your comment were not considered eligible for this surveillance review and justifications why are detailed below: • Zaidi *et al.* (2019) (numbered in your comment as reference 6): patients in critical care areas are outside the scope of this guideline. Although this guideline includes recommendations on transfer of patients from critical care areas to general wards, and care on the general ward following transfer (and this surveillance review has included evidence on the use of NEWS in prediction and prevention of poor outcomes at transfer from critical care areas to general wards and in risk stratification following discharge from critical care areas to general wards), in the study by Zaidi *et al.* measurement is not at/immediately before the point of transfer from critical care and so this study is not considered eligible for inclusion in the summary of evidence. • Usman *et al.* (2019) (numbered in your comment as reference 8) and Mellhammar *et al.* (2019) (numbered in your comment as reference 9): as noted above, evidence specific to sepsis was not summarised in this surveillance review as this is covered by the NICE related guideline on sepsis: recognition, diagnosis and early management (NG51).

		5. Comparison of early warning scores in patients with COPD exacerbation: DECAF and NEWS score. Author(s): Echevarria, Carlos; Steer, John; Bourke, Stephen C Source: Thorax; Oct 2019; vol. 74 (no. 10); p. 941-946 6. Using the National Early Warning Score (NEWS/NEWS 2) in different Intensive Care Units (ICUs) to predict the discharge location of patients Author(s): Zaidi H.; Bader-El-Den M.; McNicholas J. Source: BMC public health; Sep 2019; vol. 19 (no. 1); p. 1231 7. Predictors of in-hospital cardiac arrest within 24 h after emergency department triage: A case-control study in urban Thailand. Author(s): Srivilaithon, Winchana; Amnuaypattanapon, Kumpol; Limjindaporn, Chitlada; Imsuwan, Intanon; Daorattanachai, Kiattichai; Dasanadeba, Ittabud; Siripakarn, Yaowapha Source: Emergency medicine Australasia : EMA; Oct 2019; vol. 31 (no. 5); p. 843-850 8. Comparison of SIRS, qSOFA, and NEWS for the early identification of sepsis in the Emergency Department. Author(s): Usman, Omar A; Usman, Asad A; Ward, Michael A Source: The American journal of emergency medicine; Aug 2019; vol. 37 (no. 8); p. 1490-1497 9. NEWS2 is superior to qSOFA in detecting sepsis with organ dysfunction in the emergency department	Two further citations included in your comment have also been considered for inclusion in the summary of evidence: Inada-Kim and Nsutebu, 2018. (https://www.bmj.com/content/360/bmj.k1260) This is a views article and is not eligible for inclusion in the surveillance review summary of evidence on the basis of study design. Kellett *et al.* (2019). (https://www.ncbi.nlm.nih.gov/pubmed/31351762) This is an editorial letter and is not eligible for inclusion in the surveillance review summary of evidence on the basis of study design. Some of your suggested studies were published after the searches were run for this surveillance review. Thank you for bringing these more recent studies to our attention. The following studies were considered eligible for this surveillance review and have been added to the summary of evidence. • Foy *et al.* (2019). Four early warning scores predict mortality in emergency surgical patients at University Teaching Hospital, Lusaka: a prospective observational study (numbered in your comment as reference 4) • Echevarria *et al*. (2019). Comparison of early warning scores in patients with COPD exacerbation: DECAF and NEWS score (numbered in your comment as reference 5). • Srivilaithon *et al.* (2019). Predictors of in-hospital cardiac arrest within 24 h after emergency department triage: a case-control study in urban Thailand (numbered in your comment as reference 7). • Martin-Rodriguez *et al.* (2019). Accuracy of National Early Warning Score 2 (NEWS2) in Prehospital Triage on In-

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		Author(s): Mellhammar L.; Linder A.; Tverring J.; Christensson B.; Akesson P.; Kahn F.; Boyd J.H.; Sendi P. Source: Journal of Clinical Medicine; Aug 2019; vol. 8 (no. 8) 10. Analysis of the early warning score to detect critical or high-risk patients in the prehospital setting. Author(s): Martín-Rodríguez, Francisco; Castro-Villamor, Miguel Ángel; del Pozo Vegas, Carlos; Martín-Conty, José Luis; Mayo-Iscar, Agustín; Delgado Benito, Juan Francisco; del Brio Ibañez, Pablo; Arnillas-Gómez, Pedro; Escudero-Cuadrillero, Carlos; López-Izquierdo, Raúl Source: Internal & Emergency Medicine; Jun 2019; vol. 14 (no. 4); p. 581-589 11. Smith GB, Prytherch DR, Jarvis S et al. A comparison of the ability of the physiologic components of Medical Emergency Team criteria and the U.K. National Early Warning Score to discriminate patients at risk of a range of adverse clinical outcomes. Crit Care Med 2016;44:2171–81. https://doi.org/10.1097/CCM.0000000000002000 12. Churpek MM, Snyder A, Han X et al. Quick Sepsis-related Organ Failure Assessment, Systemic Inflammatory Response Syndrome, and early warning scores for detecting clinical deterioration in infected patients outside the intensive care unit. Am J Respir Crit Care Med 2017;195:906–11. https://doi.org/10.1164/rccm.201604-0854OC For too long, we have allowed unnecessary variation to occur in critical processes across the NHS. This is	Hospital Early Mortality: A Multi-Center Observational Prospective Cohort Study (numbered in your comment as reference 3). • Martin-Rodriguez *et al.* (2019). Analysis of the early warning score to detect critical or high-risk patients in the prehospital setting (numbered in your comment as reference 10). The study by Foy *et al*. provides further evidence of the superior performance of NEWS compared with MEWS and provides a comparison with two additional tools (NEWS vs. mHOTEL and NEWS vs. TOTAL), but these additional two comparisons are only present in a single study (Foy *et al*., 2019). The study by Echevarria *et al.* (2019) contributed an additional comparison of NEWS2 and NEWS. The two included studies comparing NEWS2 with NEWS give conflicting results in terms of which score has superior performance. However, it should be noted that both studies were in specific study populations with respiratory conditions. The study by Srivilaithon *et al.* (2019) provided an additional comparison (NEWS vs. NEWS plus additional predictors), but this comparison was only available in a single study. The two reports by Martin-Rodriguez *et al.* (2019) shared study funding and research ethics committee registration details in common and so are considered to be linked to the same study. Both provide comparisons of NEWS2 with other tools in the prehospital setting in Spain. These 4 included studies do not change the conclusion of the evidence summary, in that: • NEWS appears superior to MEWS • only limited comparative studies are available for NEWS2 (in which study populations, settings and tested comparisons vary). Only 2 UK-based NEWS2 comparative studies were identified, which were both performed in specific study populations with respiratory conditions.

		particularly evident in the assessment of patients admitted with emergency conditions, and during communication and handover, as patients commonly traverse multiple healthcare settings. https://www.bmj.com/content/360/bmj.k1260 The Patient Safety Alert mandating the use of NEWS2 in all acute/ambulance settings went some way to addressing this. NEWS2 is now being used/in the process of being implemented in >99% of acute trusts and 100% of ambulance trusts in England. It is the perception of front line clinicians, clinical leads, safety/improvement experts, national policy leads, deterioration academics and patients, that NEWS represents the best evidenced, most pragmatic and effective- physiological scoring system that can be utilised in all healthcare settings. Up to 2018, the NEWS document has been downloaded over ¼ million times, with over 220,000 downloads in the UK and over 40,000 downloads from across the world. This significantly outscores downloads of other national guidance documents. The RCP states this has now significantly increased with the release of NEWS2. Whatever the system for "describing" the level of sickness in any healthcare system; it must be usable and utilised in all settings. A score in one setting must mean the same in any other. Increasingly, healthcare professionals in community settings are using NEWS2 to communicate	• comparisons of NEWS with other tools are largely based on single studies conducted in NHS and non-NHS settings. Thank you for also providing the table of data in your comment that supports NEWS prediction of outcomes at referral from the community. We recognise the work that is ongoing at a national level within the NHS to mandate and standardise the use of the NEWS2 tool and note your comments that standardisation favours patient safety. We agree that the timely recognition of clinical deterioration and appropriate response to deterioration is a very important clinical issue. In April 2019 we amended recommendation 1.4 to state that NEWS2 has been endorsed by NHS England. The aim of this amendment was to align this guideline with current policy drivers and give a consistent message for healthcare professionals. While the comparative evidence identified in this surveillance review was not considered to conclusively demonstrate the superiority of NEWS2 over other available tools (with only limited comparative studies identified for NEWS2), we acknowledge the benefits of providing a clear message and believe that the amendment of recommendation 1.4 that was made in April 2019 supports this message. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time. We believe that further research and evaluation of NEWS2 in practice would strengthen the evidence base in this area. For this purpose, we have asked stakeholders in this consultation if they consider that the existing research recommendations in this guideline are still valid. We will continue to promote the research recommendations with the National Institute for Health Research. The publication status of any such ongoing research and the

		physiological risk at referral points enabling a common language across healthcare. This is a critical safety mechanism to ensure that the pathway as a whole is aware of the urgency/prioritization, placement and planning that is required around these patients- prior to them 'turning up at the hospital'. We have unpublished data that demonstrates that NEWS predicts outcomes at referral points from the community. 23,821 patients referred to a single hospital site with NEWS/NEWS2 at referral points showed:	potential impact on recommendations in this guideline will be monitored.

NEWS/NEWS2	Mortality Rate (all LOS)
0-2	6.8%
3-4	11.4%
5-6	19.5%
7-8	25.8%
≥ 9	32.6%

Source of Referral	Average NEWS of patients who survive	Average NEWS of patients who die ≤ 5 days of referral
GP	2.8	5.5
A&E	2.7	6.7
A&E Resus	5.3	11

With this improved version of NEWS, healthcare organisations in England now have the opportunity to use a single unadulterated score to describe the physiological sickness of patients in all care settings. If clinicians are “all on the same page” across the care pathway and communicate using this score, the severity of illness, prioritisation, transportation, and placement of patients becomes clearer. Tracking NEWS from an established baseline enables accurate understanding as to whether patients are deteriorating further and need prompt review and escalation.

Potential harm could occur as a result of having variable scoring systems across regions, or even within the same organisation, and this is magnified when we consider how frequently staff and patients move around.

We must be extremely careful over leaving the door open for variation in the deterioration tools being used.

		In December 2017, an updated version of NEWS (NEWS 2) was published. It contains welcomed improvements on the previous version of NEWS. For example, the chronic hypoxia sub chart helps to better tailor escalation to baseline oxygen levels in those with respiratory disease. It also includes the addition of delirium to the consciousness sub chart, and the reinforcement of the value of aggregate scores versus single parameter extreme recordings (which are inferior). Because NEWS was developed from comparing the observations of emergency admission survivors and non survivors, and infection is the most common reason for admission, it is unsurprising that NEWS is at the heart of the national operational definition for sepsis, and the best EWS at predicting outcomes from this group. Furthermore, it is worth bearing in mind how predictive low NEWS is for survival https://www.ncbi.nlm.nih.gov/pubmed/31351762 When NEWS is compared with all other EWS (qSOFA, SIRS, RFS/NICE, MEWS) it consistently outperforms them all, in all cause deterioration (and sepsis). Condition specific EWS (e.g. DECAF in COPD, CURB65 in pneumonia) get close to NEWS, but we must be mindful of our recommendations in the light of what actually happens in front line care. We must guard against blinkered, condition-specific approaches in both assessment and measurement. When patients are admitted as emergencies, the cause of	

		deterioration is often unclear. Diagnostic certainty only really comes at the end of an admission, once tests are back and the patient's response to treatment is processed. The optimal system is one that highlights a patient who might be ill and escalates them to the attention of a senior clinical decision maker to exercise their clinical judgement. National organisations need to align with what is happening at the front line, across the country and consider the whole systems benefits that such large scale cross setting standardisation enables.	
PMD Device Solutions Limited	No	- The adoption and refinement of the clinical workflow and patient pathways pertaining to the adoption of NEWS have been well established. - The core recommendation submitted for consultation is to specify that 'Objective' monitoring of vital signs shall be undertaken. The rational for this is supplied below in 1a. - Presently there is no specified modality for measuring vital-signs within the guidelines. - The quality of vital sign measurements is directly linked to the accuracy and effectiveness of NEWS. - The inclusion of Objective monitoring would identify that hospitals have a choice to select the modality best suited for their clinical environment. - Technologies for Blood Pressure, Heart Rate, Temperature, and blood oxygenation are readily available. - Over the past 5-7 years, innovative technologies have emerged for measuring Respiratory Rate and they are presently being evaluated across NHS Hospitals.	Thank you for your response. We note that you disagree with the proposal to not update the guideline. We recognise the work that is currently ongoing within the NHS to establish and standardise the use of the NEWS2 tool. We performed a focused search for evidence on early warning scores, including NEWS2, in this surveillance review and have presented these findings in the summary of evidence. You comment that good quality measurement of vital signs is key to the accuracy and measurement of NEWS and that the RespiraSense technology has been on the NHS Innovation Accelerator since 2017. We agree that recommendations in this guideline do not currently specify which mode should be used for measurement of vital signs. We note that you consider that objective monitoring of vital signs should be recommended in this guideline and you comment that inclusion of objective monitoring in guideline recommendations would identify that hospitals could choose the best suited modality of vital signs measurement for their setting. We did not identify any

		RespiraSense is one such technology and has been on the NHS Innovation Accelerator since 2017. 1] Loughlin, Patrick C. et al. Respiratory Rate: The Forgotten Vital Sign—Make It Count! Joint Commission Journal on Quality and Patient Safety. 2018;44:8:494 - 499 [2] Churpek MM, Adhikari R, Edelson DP. The value of vital sign trends for detecting clinical deterioration on the wards. Resuscitation. 2016;102:1–5. [3] Churpek MM, et al. Multicenter comparison of machine learning methods and conventional regression for predicting clinical deterioration on the wards. Crit Care Med. 2016;44:368–374. [4] Cretikos MA, et al. Respiratory rate: the neglected vital sign. Med J Aust. 2008 Jun 2;188:657–659. [5] Kellett J, et al. Trends in weighted vital signs and the clinical course of 44,531 acutely ill medical patients while in hospital. Acute Med. 2015;14:3–9. [6] Subbe CP, et al. Effect of introducing the Modified Early Warning Score on clinical outcomes, cardio-pulmonary arrests and intensive care utilisation in acute medical admissions. Anaesthesia. 2003;58:797–802. [7] Buist M, et al. Association between clinically abnormal observations and subsequent in-hospital mortality: a prospective study. Resuscitation. 2004;62:137–141. [8] Kause J, et al. A comparison of antecedents to cardiac arrests, deaths and emergency intensive care admissions in	evidence specifically on objective measurement of vital signs in this surveillance review. Thank you for forwarding citation details of published evidence in your comment. We have carefully considered the eligibility of each of these in turn. The following studies suggested in your comment were published before the guideline searches and so would have been available for consideration in development of this guideline: • Subbe *et al.* (2003) (numbered in your comment as reference 6) • Buist *et al*. (2004) (numbered in your comment as reference 7) • Kause *et al*. (2004) (numbered in your comment as reference 8) • Hogan *et al.* (2006) (numbered in your comment as reference 11) • Lovett *et al*. (2005) (numbered in your comment as reference 15) • Butler-Williams *et al.* (2005) (numbered in your comment as reference 16) • Edmonds *et al.* (2002) (numbered in your comment as reference 17) • Maclean *et al*. (1967) (numbered in your comment as reference 20) • Simmons *et al.* (1968) (numbered in your comment as reference 21)

		Australia and New Zealand, and the United Kingdom—the ACADEMIA study. Resuscitation. 2004;62:275–282. [9] Kellett J, Sebat F. Make vital signs great again—a call for action. Eur J Intern Med. 2017;45:13–19. [10] Badawy J, et al. Is everyone really breathing 20 times a minute? Assessing epidemiology and variation in recorded respiratory rate in hospitalised adults. BMJ Qual Saf. 2017;26:832–836. [11] Hogan J. Why don't nurses monitor the respiratory rates of patients? Br J Nurs. 2006;15:489–492 May 11–24. [12] Jonsson T, et al. Nursing documentation prior to emergency admissions to the intensive care unit. Nurs Crit Care. 2011;16:164–169. [13] McGain F, et al. Documentation of clinical review and vital signs after major surgery. Med J Aust. 2008 Oct 6;189:380–383. [14] Semler MW, et al. Flash mob research: a single-day, multicenter, resident-directed study of respiratory rate. Chest. 2013;143:1740–1744. [15] Lovett PB, et al. The vexatious vital: neither clinical measurements by nurses nor an electronic monitor provides accu- rate measurements of respiratory rate in triage. Ann Emerg Med. 2005;45:68–76. [16] Butler-Williams C, Cantrill N, Maton S. Increasing staff awareness of respiratory rate significance. Nurse Times. 2005;101:35–37 Jul 5–11.	• Tang *et al.* (1998) (numbered in your comment as reference 22) • Fieselmann *et al.* (1993) (numbered in your comment as reference 24) Previous surveillance reviews to determine the need to update this guideline were published in 2010 and 2016. The following studies would have been available for consideration in these previous surveillance reviews: • Cretikos *et al.* (2008) (numbered in your comment as reference 4) • Kellett *et al.* (2015) (numbered in your comment as reference 5) • Jonsson *et al.* (2011) (numbered in your comment as reference 12) • McGain *et al.* (2008) (numbered in your comment as reference 13) • Semler *et al.* (2013) (numbered in your comment as reference 14) • Philip *et al.* (2013) (numbered in your comment as reference 18) • Lynn *et al.* (2011) (numbered in your comment as reference 19) • Kenzaka *et al*. (2012) (numbered in your comment as reference 23) Some of these studies have already been included in the summary of evidence for this surveillance review. These include:

		[17] Edmonds ZV, et al. The reliability of vital sign measurements. Ann Emerg Med. 2002;39:233–237. [18] Philip K, Richardson R, Cohen M. Staff perceptions of respiratory rate measurement in a general hospital. Br J Nurs. 2013;22:570–574 May 23–Jun 12. [19] Lynn LA, Curry JP. Patterns of unexpected in-hospital deaths: a root cause analysis. Patient Saf Surg. 2011;5:3 Feb 11. [20] Maclean LD, et al. Patterns of septic shock in man—a de- tailed study of 56 patients. Ann Surg. 1967;166:543–562. [21] Simmons RL, et al. The role of the central nervous system in septic shock. II. Hemodynamic, respiratory and metabolic effects of intracisternal or intraventricular endotoxin. Ann Surg. 1968;167:158–167. [22] Tang GJ, Kou YR, Lin YS. Peripheral neural modulation of endotoxin-induced hyperventilation. Crit Care Med. 1998;26:1558–1563. [23] Kenzaka T, et al. Importance of vital signs to the early diagnosis and severity of sepsis: association between vital signs and sequential organ failure assessment score in patients with sepsis. Intern Med. 2012;51:871–876. [24] Fieselmann JF, et al. Respiratory rate predicts cardiopulmonary arrest for internal medicine inpatients. J Gen Intern Med. 1993;8:354–360. Quality of Care	• Churpek *et al.* (2016) (numbered in your comment as reference 2) • Churpek *et al.* (2016) (numbered in your comment as reference 3) Some studies were published since the last previous surveillance review and were not identified in the surveillance review but were not considered eligible for the reasons described below: • Loughlin *et al.* (2018) and Kellett *et al.* (2017) (numbered in your comment as references 1 and 9): not eligible based on study design (literature review) • Badawy *et al.* (2017) (numbered in your comment as reference 10): we agree that this study supports your statement that 'respiratory rate remains the most inaccurately measured and recorded vital sign.' However, this study does not provide results data relevant to the key clinical review questions in this guideline and so is not considered eligible for inclusion in the summary of evidence. While we acknowledge that the accurate measurement of vital signs is an important issue relevant to this guideline, the published studies suggested in your comment are not considered eligible for addition to the summary of evidence for this surveillance review and so are not anticipated to impact on existing recommendations in the guideline. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.

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		- There is a significant quality of care and patient safety issue concerning the accuracy of vital sign measurements. In particular to the subjective measuring of Respiratory Rate. Respiratory Rate remains the most inaccurately measured and recorded vital sign. [4,10–16] - Respiratory rate is the sentinel and arguably most important vital sign because its normal values are breached before those of other vital signs in nearly all states of clinical decline. Changes in respiratory rate are often the earliest warning of sepsis, systemic inflammatory response syndrome, shock, and respiratory insufficiency, among others. In these conditions, abnormalities in respiratory rate first herald the need for additional patient assessment and rapid intervention to prevent further decline and unexpected cardiac arrest. [1–9] - There is no gold standard for respiratory rate measurement; on general wards the traditional method is to manually count the number of breaths for one minute, which is not as easy as it might seem, given the significant interobserver measurement variability among trained clinicians.[17] - In one study, nurses recorded nearly 72% of all respiratory rates as either 18 or 20 bpm, whereas only 13% measured by trained observers had these values, confirming a significant bias and/or multiplication artefact. [14] - A larger study of 36,966 hospitalizations also showed that, in contrast to heart rates, there was a skewing of respiratory rates toward a perceived “normal patient” range with even-number values of 18 or 20 bpm. [10] Clinicians report that they estimate rather than actually measure respiratory rate. [18]	

		Epidemiology - Although multiple vital sign changes take place as a patient deteriorates, some occur earlier and are more informative than others. Tachypnea with respiratory alkalosis is the first manifestation of many serious conditions. [19] - If conditions are recognized and treated prior to development of metabolic acidosis and/or hypoxia, outcomes are improved. [19,20,21,22] - Respiratory rate is more significantly correlated with the severity of sepsis than either heart rate or blood pressure, [23] and Subbe et al. highlight that although there can be abnormalities in blood pressure and heart rate prior to a severe adverse event, these are tiny compared to the changes in respiratory rate and, therefore, more likely to be missed in the clinical setting. [6] - Respiratory rate > 27 bpm is also a better predictor of cardiac arrest within 72 hours than heart rate or blood pressure. [24] - Kellett et al study (N = 44,531) found that changes in respiratory rate are highly prognostic of in-hospital mortality and that this instability predicted patient outcome days in advance of any other obvious deterioration. [5] A large retrospective study of 269,999 patients, to evaluate the predictive value of 29 electronic health record variables for the composite outcome of cardiac arrest, ICU transfer, and death, found that abnormal respiratory rate was the most prognostic. [3]	
Royal Berkshire NHS Foundation Trust	No	No comment	Thank you for your response. We note that you disagree with the proposal to not update the guideline.

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The Royal College of Physicians and Surgeons of Glasgow	Yes	The Royal College of Physicians and Surgeons of Glasgow although based in Glasgow represents Fellows and Members throughout the United Kingdom. While NICE has a remit for England, many of the recommendations are applicable to all devolved nations including Scotland. They should be considered by the relevant Ministers of the devolved governments. Similarly, this is a common issue throughout the NHS in the UK. Consideration of evidence appears to linked solely to the NHS in England and reference to the Royal College of Physicians of London. Generally, yes. However, the College is concerned that there are still issues in this important area where deteriorating patients are not detected early enough or patients are simply not monitored. The committee has looked only published evidence rather than where care has not been optimal. Datix reports especially “Never events” have not been reviewed. HM Coroner’s inquest data have not been reviewed. Great emphasis is placed on the EWS whereas what is important is that it heralds clinical review. EWS can miss deteriorating patients. This is not discussed. An example would be a neuro-musculo-junction problem where patients vital signs are preserved and the patient does not appear breathless eg Dermato_ or Polymyosiits or Myasthenia etc.	Thank you for your response. We note that you agree with the proposal to not update the guideline. We can confirm that we did not restrict our consideration of evidence to the NHS in England. We included both UK-based and non-UK-based studies in our summary of evidence. We also considered a range of sources of evidence in addition to published evidence, including feedback from topic experts and related documents (for example, we included a relevant report cited by a topic expert issued by the Healthcare Safety Investigation Branch [HSIB]. We included the key points and recommendations from the HSIB report). Surveillance reviews do not routinely consider Datix reports or HM Coroner’s inquest data. Thank you for noting the potential limitations of early warning scores. We have taken care to report the predictive performance of these tools. Some included studies were performed in specific study populations (e.g. with respiratory conditions) and these details were noted in the summary of evidence. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.

		There is only a brief mention of HSIB review.	
Royal College of Physicians of London	No	The RCP is grateful for the opportunity to respond to the above consultation. In doing so we would like to endorse the comments submitted by the Renal Association and the British Geriatric Society. We have also liaised with our Patient Safety Committee and would like to make the following comments. Guidance can be more specific around monitoring frequency, response times, and threshold. The role of patient or clinician concern has not been included. The role of delirium as a trigger for deterioration should be evaluated. There is little guidance on the nature of the response or potential outcomes from the response	Thank you for your response. We note that you disagree with the proposal to not update the guideline. We engaged with topic experts in this surveillance review. Based on their feedback we performed searches for evidence on specific parts of the guideline, including the use of track and trigger tools/early warning scores and response strategies. We considered the potential impact of the identified up to date evidence on guideline recommendations. You comment that guidance can be more specific on monitoring frequency, response times and threshold. One study was identified in this surveillance review on the frequency of EWS measurements and this was included in the summary of evidence. Details of EWS threshold were included in the summary of evidence where available. One study each reported reassessment response time and time from patient deterioration to intervention as an outcome and this data was included in the summary of evidence. You comment that the role of patient or clinical concern has not been included. Recommendation 1.8 states that the response strategy for patients at risk of clinical deterioration should be triggered by either physiological track and trigger score or clinical concern. No evidence on the role of patient concern in triggering response to deterioration was identified in this surveillance review. One study was identified that considered worry of nursing staff as a factor in triggering response to deterioration and this was included in the summary of evidence. You comment that the role of delirium as a trigger for deterioration should be evaluated. While no evidence specifically relating to the

			role of delirium was identified in this surveillance review, we understand that delirium is a component of NEWS2. You note that there is little guidance on the nature of the response to deterioration or potential outcomes from the response. As described above, we performed searches to identify evidence on response strategies and included this in our summary of evidence. Identified evidence evaluated the effects of a range of response strategies. However, the tested strategies varied between studies and no evidence was found that directly compared one response strategy with another. We concluded that the evidence identified in this surveillance review is consistent with the current guideline recommendation that states: 'no specific service configuration can be recommended as a preferred response strategy for individuals identified as having a deteriorating clinical condition.' We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.
Society for Acute Medicine	No	We feel that there has been a large change in the way hospitals practice in the 12 years since this guideline was issued and this needs addressing. Although there might not be NICE methodology approved evidence there is a lot of data available to look at. Given the subject matter, we feel it will be hard ot get high quality research evidence (eg RCT) to support your methodology The Society feel so strongly re this that if NICE do 'nothing' then would NICE object to SAM (in collaboration with perhaps RCP) updating this themselves and releasing	Thank you for your response. We note that you disagree with the proposal to not update the guideline. We can confirm we did not restrict our surveillance review to only RCTs but also included other study types, such as observational studies. In addition, we considered other sources of evidence in addition to published studies, including feedback from topic experts and relevant policy and related documents. In view of the limited detail provided in this comment, we would welcome feedback on any specific challenges relating to changes in service delivery on the implementation of this guideline. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.

Intensive Care Society	Yes	No comment	Thank you for your response. We note that you agree with the proposal to not update the guideline. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.
UK Renal Association	Yes	1. I fully support the need for further research as outlined in the existing research recommendations. 2. The NIHR should again be asked to support research on those recommended areas, as the acutely ill patient remains a major issue in NHS Hospitals, as shown by the HSIB report.	Thank you for your response. We note that you: • agree with the proposal to not update the guideline • support the need for further research as described in the existing research recommendations • consider that the NIHR should support these research recommendations based on clinical relevance and the HSIB report cited in our summary of evidence. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time. We will further promote the guideline research recommendations with the NIHR upon publication of this surveillance review.
Royal College of Nursing	Yes	Although the current guidance document is over 10 years old, the reason not to update is well justified. There are also number of national workstreams currently underway to address the recognition and management of deteriorating patients which the Royal College of Nursing is directly involved: 1. NHS England Acute Deterioration Board 2. Implementation of NEWS2 across the NHS England	Thank you for your response. We note that you agree with the proposal to not update the guideline and consider the reason not to update to be well justified. Thank you for highlighting that there are several current national workstreams of relevance to this guideline. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.

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		3. National Outreach Forum project on development of National Competency Framework for Critical Care Outreach Nurses 4. Faculty of Intensive Care Society project on Enhanced Care 5. Intensive Care Society Guidelines on transfer of the critically ill patients.	

2. Do you have any comments on areas excluded from the scope of the guideline?			
Stakeholder	Overall response	Comments	NICE response
Bedfordshire and Luton Fair Play	No	No comment	Thank you for your response. We note that you have no comments on areas excluded from the scope of the guideline.
British Geriatrics Society	No	No comment	Thank you for your response. We note that you have no comments on areas excluded from the scope of the guideline.
NHS England and NHS Improvement	Yes	No comment	Thank you for your response. We note that you consider there are areas excluded from the scope of the guideline but provide no further details of any potential areas.
PMD Device Solutions Limited	No	No comment	Thank you for your response. We note that you have no comments on areas excluded from the scope of the guideline.
Royal Berkshire NHS Foundation Trust	Yes	The recommendation for patient and relative activated rapid response should be included as per GPIC guidelines, International Society for Rapid Response Systems metrics and publication;	Thank you for your response. We note that you consider that a recommendation relating to patient and relative activated rapid response should be included in the guideline (as in the guidelines for provision of intensive care services at the link provided).

		• Odell M 2018. Patient and relative activated critical care outreach: a seven year service review. British Journal of Nursing. • Subbe, Bannard-Smith, Bunch et al 2019. Quality metrics for the evaluation of rapid response systems: proceedings from the third international consensus conference on rapid response systems. Resuscitation • GPICS: *https://www.ficm.ac.uk › standards-research-revalidation › guidelines-prov...*	We did not identify any evidence relating to patient and relative activated critical care outreach in this surveillance review. The study by Odell *et al.* describes the activation of a critical care outreach system by a range of groups, including patients and relatives. However, this study does not contribute comparative data and would not have been eligible for inclusion in the summary of evidence in this surveillance review. The study by Subbe *et al.* aimed to develop a core quality metric for the evaluation of RRS via a consensus process. While this is relevant to the design and conduct of future research on rapid response systems, it would not have been eligible for inclusion in the summary of evidence. The comparative evidence identified in this surveillance review did not permit definitive conclusions on the specific configuration of response that should be used. We also did not identify any eligible evidence on patient and relative activated rapid response in this surveillance review. We consider that further research would allow more definitive conclusions to be made on the most effective configuration of response strategy. Therefore, we will consider the potential inclusion of patient and relative activated rapid response in the scope at the next surveillance review of this guideline.
The Royal College of Physicians and Surgeons of Glasgow	No	No comment	Thank you for your response. We note that you have no comments on areas excluded from the scope of the guideline.
Royal College of Physicians of London	Yes	Guidance should be widened beyond hospitals to all emergency care situations.	Thank you for your response.

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			The scope of this guideline currently includes patients in the emergency department and those in transition. Studies on the use of early warning scores in the prehospital setting have been included in this summary of evidence.
Society for Acute Medicine	Yes	You need to take account of things such as HSIB investigations/CQC reports/RCP evidence re NEWS2/safety alerts- whilst these might not fit strictly with NICE methodology they form a fairly substantial body of work in an area in which you will not get RCT evidence	Thank you for your response. We can confirm we did not restrict our surveillance review to only RCTs but also included other study types, such as observational studies. In addition, we considered other sources of evidence in addition to published studies, including feedback from topic experts and relevant policy and related documents (including a report from the HSIB).
Intensive Care Society	No	No comment	Thank you for your response.
UK Renal Association	Yes	This is an indirect comment; there was some evidence on the mode of delivery, comparing the use of electronic early warning systems with paper-based systems in recognition of patient deterioration. NICE should include more horizon scanning and summaries for Directors of IT and the boards of acute Trusts, to assist them in determining the value of investing in electronic systems; this is quite difficult to determine between the 2019 surveillance work on CG50 and the Medtech innovation briefings. There would be a case for updated health economic work when the guideline is updated, to look at case studies of the costs and benefits of a switch to electronic systems.	Thank you for your response. We note that you believe there would be value in NICE providing additional horizon scanning/ summaries to directors of IT and boards of acute trusts to inform their decision making around investment in electronic systems. In our evidence summary we have flagged 3 NICE medical technology innovation briefings (VitalPAC for assessing vital signs of patients in hospital MIB79, EarlySense for heart and respiratory monitoring and predicting patient deterioration MIB49, and Visensia for early detection of deteriorating vital signs in adults in hospital MIB36) and an in-development digital health technology pilot (Lifelight First for monitoring vital signs) that have relevance to electronic monitoring of patient vital signs. We will forward this feedback to our medical technologies evaluation programme and public involvement programme teams.

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			We note you consider updated health economic work would be useful in the future. We have considered all consultation comments in detail but retain our proposal not to update the guideline at this time.
Royal College of Nursing	No	No comment	Thank you for your response.

3. Do you have any comments on equalities issues?			
Stakeholder	Overall response	Comments	NICE response
Bedfordshire and Luton Fair Play	Yes	Health research is demonstrating that women's outward signs are not read as well as men's e.g. heart attack symptoms.	Thank you for your response. We have provided details in the summary of evidence where studies are reported in specific study populations to allow consideration of the recognition of deterioration in particular groups. No specific evidence comparing signs of deterioration between men and women was identified in this surveillance review.
British Geriatrics Society	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
NHS England and NHS Improvement	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
PMD Device Solutions Limited	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.

Royal Berkshire NHS Foundation Trust	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
The Royal College of Physicians and Surgeons of Glasgow	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
Royal College of Physicians of London	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
Society for Acute Medicine	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
Intensive Care Society	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
UK Renal Association	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
Royal College of Nursing	No	No comment	Thank you for your response. We note that you have no comments on equalities issues.
4. Do you consider that the research recommendations in this guideline are still valid?			
Stakeholder	Overall response	Comments	NICE response

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Bedfordshire and Luton Fair Play	Yes	No comment	Thank you for your response. We note that you consider that the research recommendations in this guideline are still valid.
British Geriatrics Society	Yes	No comment	Thank you for your response.
NHS England and NHS Improvement		Comments regarding the linked document from the left margin: We strongly feel that the deterioration guidance needs a significant update. Deterioration and its management, our understanding within it, and the evidence have really moved on. Comments: p.5 needs some scale and scope ie. 6.7 million emergency admissions in England per year, 190,000 deaths, 90% are predictable due to changes in physiology/NEWS. Since NEWs implementation there has been a national drop in overall mortality rates by 5.4% and in hospital cardiac arrest rates by 8.4% (Hogan et al, NIHR 2019) There needs to be clarity on (English estimates below) 1. The numbers dying due to deterioration e.g. 190,000 per year 2. the preventable deaths due to deterioration e.g. 6,840-20,520 per year 3. the demographic involved e.g. proportionality by age band 4. the most prevalent and amenable root causes of these avoidable deaths e.g. communication, human factors, orientation/training 5. a road map for how to support widescale improvement 6. the costs involved of both ward and ICU length of stay	Thank you very much for your response. We note that you consider that this guideline should be updated. You state that the guideline requires additional details on scale and scope and cite the paper by Hogan *et al.* (which has been included in the summary of evidence). While this surveillance review does not consider the introductory information relating to the guideline, this feedback will be retained for consideration in any future update of this guideline. You comment that recommending adverse event reporting for out of hours transfer of patients from critical care (as in recommendation 1.14) should be reconsidered. In the full guideline it is stated that the guideline development group recognised the pressure on both critical care and inpatient hospital beds and difficulties in transfer from critical care but recommended avoidance of transfer during the stated nighttime hours. While focused searches for evidence were not performed for this section of the guideline (based on topic expert feedback), we identified some evidence (2 systematic reviews and 2 cohort studies) on patient outcomes based on timing of transfer from critical care to the general ward. The evidence identified on timing of discharge was considered on balance to be consistent with recommendation 1.14

		It would be pertinent to illustrate the mortality rate from deterioration in ward situations here e.g. new NEWS 7 in an acute ward deterioration is associated with 50% 30-day mortality. Please reconsider recommending adverse event reporting for an event that is often unavoidable and not due to anyone's 'fault'. We often need to transfer patients out of ICU at odd hours, because of acutely deteriorated patients in extremis elsewhere. p.7 explicitly state that NEWS2 is being implemented everywhere, and is supported by NICE. Can I ask what NICE is supporting in lieu of NEWS2? p.7 explicitly state that training of staff in deterioration is a mandatory requirement not an optional one; and that the mechanisms for this delivery should be sustainably supported and informed by local examples of missed deterioration. p.7 suggesting avoiding transfers between 2200-0700 is sensible, asking for incident reporting within a NICE document is a little extreme- sometimes there really is no option for hard pressed clinicians (e.g. cardiac arrest needing urgent ICU admission, I would not call that an adverse incident) p.7 NEWS has been shown to accurately predict ICU readmission, and death on discharge from ICU. p.8 1.1 All patients require being assessed with majors designation require observations in acute areas, not just those being admitted. This is done within 15 minutes of arrival.	to avoid transfer out of critical care to the general ward during nighttime hours. In this surveillance review we searched for evidence on tools for recognition of clinical deterioration, including NEWS2. As noted in the summary of evidence, only limited comparative studies were identified for NEWS2 and so we concluded that further evidence is required to conclusively demonstrate superior performance of NEWS2 compared with other available tools. However, we acknowledge the value of providing a consistent message to health care professionals and consider the amendment of recommendation 1.4 that was made in April 2019 (to state that NEWS2 has been endorsed by NHS England) supports this message. Searches to identify evidence specifically on training for recognition and response to deterioration were not performed in this surveillance review (based on topic expert feedback). However, we did identify several studies that are included in the current and previous surveillance reviews that are supportive of the provision of appropriate staff training and were considered consistent with recommendation 1.1 that staff recording and acting upon physiological observations should have appropriate training to undertake the procedures and understand the clinical relevance. You have commented that NEWS predicts ICU readmission and death on discharge from ICU. In this surveillance review we identified a study (included in the evidence summary) to demonstrate that applying NEWS at transfer from ICU predicted readmission. An additional included study showed that NEWS measured immediately before ICU discharge predicted early clinical deterioration within 24 hours of discharge. You comment on recommendation 1.1 to state that all patients with majors designation require observations in acute areas, not just

		It is unclear whether the intention is this plan being formulated at nurse triage, doctor clerking or senior review. There needs to be some clarity here, as all three are different. At the time of clinician review, there should be treatment escalation planning to determine: 1. CPR status 2. Treatment status IV/PO treatment warranted Ventilation warranted (invasive or non invasive) 3. Feeding/fluids limitations 4. Admission limitations • For full intervention ICU admission (intubation, inotropes, filtration) • For limited ICU admission (inotropes) • For ward based care (and not for ICU admission) • For palliation at home and not for admission under any circumstances 1.2 Aggregate scores are far superior to single criteria based ones (e.g. MET criteria or NICE NG51) p.8 review and escalation schedule- frequency of observations, when to call a doctor for review- what thresholds, when should a more senior clinician be contacted and whom? p.9 1.4 All patients should be monitored using aggregate scoring systems and not single extreme parameter systems. All patients should be monitored using NEWS2. Usage of multiparameter is confusing as aggregate is already stated. p.9 what is the evidence behind 12 hourly observations- I don't think there is any. Though this is pragmatic, and what is done in most hospitals with NEWS.	those being admitted and that clarity is required on professionals involved. We did not find any evidence relating to this issue in this surveillance review. You also state that at the point of clinician review there should also be treatment escalation planning. We did not find any evidence relating to this issue in this surveillance review. Your comment that aggregate scores are superior to single criteria-based scores is consistent with recommendation 1.4 that states that track and trigger systems should use multiple parameter or aggregate weighted scoring systems. The frequency of observations is addressed in recommendation 1.3 that states physiological observations should be recorded at least every 12 hours unless this frequency is increased or decreased for an individual patient at a senior level, and monitoring frequency should increase if abnormal physiology is detected. You also query the evidence base for the recommendation on monitoring frequency. The evidence used to inform this recommendation is described on page 28 of the full guideline. Searches to identify evidence specifically on monitoring frequency were not performed in this surveillance review (based on topic expert feedback). However, one RCT was included in the summary of evidence comparing 8 hourly with 12 hourly EWS measurements and did not find any significant differences in negative clinical outcomes between groups. This was based on a single study and so overall findings were considered to support the frequency of monitoring in recommendation 1.3 You comment that greater clarity is needed on when to call a doctor for review, use of thresholds and when a more senior clinician should be contacted and who this should be. Recommendation 1.9 states that trigger thresholds should be set locally and we have

		p.9 when a patient deteriorates, clear documentation of when, whether this is temporary or sustained, who was contacted for advice/review. And when the response/review from a competent clinician happened. What the outcomes of this review was and onward management plan. p.9 1.3 a standardised national deterioration proforma should be signposted by NICE to cover the key criteria (e.g timeliness, who.what.where.when) This is what is being developed nationally: http://www.wessexdeanery.nhs.uk/pdf/Scale%20Up%20-%20PHT%20pilot.pdf 1.4 This needs to be more explicit to back up the use of NEWS2. Why are NICE not endorsing NEWS2? If they are not, what are they endorsing? p.10 1.5 It is very important that reference to the importance of knowing the patient's baseline is made here. a. Some patients always have a low oxygen level and are at significant risk of hypercapnic respiratory failure so require a different oxygen treatment schedule (e.g. NEWS2 scale 2) b. others have a chronically low BP (e.g. fit, healthy young patients) c. others have tachycardic syndromes (e.g. POTS) d. there is not mention of new confusion here. It is a really important signal of potential significant deterioration and is not covered by the term 'level of consciousness' (e.g. ACVPU NEWS2) e. I would order the observations here by weight of predictive value (of death) e.g. resp rate, O2 sats, air/oxygen requirement, systolic BP, Pulse, Consciousness, Temp in that order.	provided details of thresholds where available in the summary of evidence. The guideline also states that no specific service configuration can be recommended as the preferred response strategy to deterioration. The evidence identified in this surveillance review is consistent with this recommendation. You note the importance of clear documentation (including a standardised national deterioration proforma [citing the work by Portsmouth Hospitals NHS Trust as an example]) when a patient deteriorates. We did not identify evidence on this area in this surveillance review. You comment on the importance of knowing a patient's baseline (e.g. oxygen level). We did not identify evidence on this area in this surveillance review. As noted in your comment, recommendation 1.5 does not currently list new confusion (although the term level of consciousness is currently used in the recommendation). We note that NEWS2 includes new confusion as a parameter. Recommendation 1.4 was amended in April 2019 to state that NEWS2 has been endorsed by NHS England. While evidence on patient worry and relative concern was not identified in this surveillance review, recommendation 1.8 states that response should be triggered either by score or clinical concern. A study in which nurse worry is included as a factor was included in this surveillance review. You also state that the list of biochemical analyses that could be performed is extremely limited. We did not identify evidence on this area in this surveillance review. You note that the heading 'critical care outreach services for patients whose clinical condition is deteriorating' is not appropriate

		1.6 add patient worry, relatives concern, nurse worry, clinician concern. The list of biochemical analysis listed is extremely limited. There are a lot that could be added. p.10 1.7 this is not an appropriate heading, it seems to imply that only CCOT can respond to deterioration. Not all hospitals have critical care outreach services, and some of these do extremely well in IHCA audits and all cause mortality.I would use the term emergency response team (the components of which are determined locally) See earlier response regarding a national standardised deterioration proforma. p.10 1.8 there is not mention of communication or escalation here, also re: flat hierarchies, standardised communication templates (e.g. SBAR, RSVP). The need for assertiveness training. There needs to also be mention of what to do at handovers of care (particularly shift to shift chronological handovers) to ensure that deteriorating patients are accurately and reliably handed over to incoming clinicians for ongoing care- and what a high quality handover should encompass. https://www.nice.org.uk/guidance/qs174/chapter/Quality-statement-4-Structured-patient-handovers doesn't really fulfill this brief. p.10 1.9 actually these are being standardised nationally in all environments. This is work being led by the RCP p.11 1.10 There is significant (and dangerous) national variation in how low, medium and high risk patients are responded	(and that you consider the term 'emergency response team' to be more fitting). Thank you for this feedback, which will be retained for consideration at the next surveillance point. We have considered other response strategies in addition to critical care outreach services and have included these in the summary of evidence. We did not identify evidence in this surveillance review on your following suggested areas: • communication and escalation • need for assertiveness training • what to do at handovers of care Thank you for highlighting that thresholds for track and trigger systems are currently being standardised in work led by the RCP. You highlight the national variation in how low, medium and high risk patients are responded to (citing the Freathy 2019 study that was not considered eligible for inclusion in this surveillance review as it did not address the clinical review questions in the guideline). We also note that you consider recommendation 1.10 to require revision and update. The evidence identified in this surveillance review was consistent with the current guideline in that it does not allow a specific service configuration to be recommended. You do not consider recommendation 1.13 on the decision to admit to critical care involving both the ward and critical care consultants to reflect real patient care. We did not find any evidence on this point in this surveillance review. As described above, we have included studies in our evidence summary on the use of NEWS in prediction of outcomes from ICU to ward transfers.

		to (Freathy et al, 2019) we have recently agreed core response timeliness, and competency standards for NEWS2 at the RCP. I would be happy to share these if useful. This whole section needs revising and updating. p.11 1.13 This does not reflect what happens in real patient care P12. 1.14 There is good evidence that NEWS predicts outcomes (death, ICU readmission) from ICU to ward transfers. Already commented on the need to remove the punitive wording. p. 12 1.15 it should be clear if and when critical care should be recontacted for urgent assessment, with what thresholds and absolute clarity of TEP (see earlier statements) Section2- Research questions In hospital deterioration can be predicted at a far earlier stage, than the hospital-centric model leads us to believe. 3.6% of hospital deaths are possibly avoidable (Hogan et al), to make further inroads, the system, itself, needs to be more aligned so that patients at risk are identified in the community, assessed well at first contact and communicated about accurately and reliably so that the whole pathway can appropriately prioritise, place and plan for the patient's arrival. This represents the largest opportunity to improve deterioration. How many patients avoidably die due to deterioration? What proportion are predictable?	Thank you very much for your detailed suggested research questions: How many patients avoidably die due to deterioration? What proportion are predictable? Where do these patients die? What is the variation nationally, and why does this exist? What is the most prevalent root causes for avoidable death in deteriorating patients? What is the role and value of clinical judgement in deterioration, and how is this augmented by NEWS or other EWS? What is the impact of worry, concern compared to physiological scores on outcomes? (Please note that we have included in the summary of evidence a related publication from this study by Douw *et al*.). What is the significance of this delta deflection? What is a significant deflection past the established baseline? How often should patients be monitored with observations in hospital? How should these observations be monitored in the community e.g baseline oxygen saturations in COPD patients When are patients most at risk of cardiac arrest? How good is the system at defining appropriate treatment escalation limits prior to cardiac arrest, emergency admission or deterioration? The impact of reliable treatment escalation planning on cardiac arrest rates, ICU admission rates etc.

		Where do these patients die? What is the variation nationally, and why does this exist? What is the most prevalent root causes for avoidable death in deteriorating patients? What is the role and value of clinical judgement in deterioration, and how is this augmented by NEWS or other EWS? What is the impact of worry, concern compared to physiological scores on outcomes? https://www.ncbi.nlm.nih.gov/pubmed/27865003 Delta NEWS. Patients who are unwell and then go on to deteriorate further do not have normal physiology, ie they are admitted with a NEWS of 4, and then further deteriorate to a NEWS of 7. What is the significance of this delta deflection? What is a significant deflection past the established baseline? How often should patients be monitored with observations in hospital? How should these observations be monitored in the community e.g baseline oxygen saturations in COPD patients When are patients most at risk of cardiac arrest? (I suspect non elective patients, within the first 3 days of admission) How good is the system at defining appropriate treatment escalation limits prior to cardiac arrest, emergency admission or deterioration? The impact of reliable treatment escalation planning on cardiac arrest rates, ICU admission rates etc.	No group has ever been able to demonstrate the value of CCOT. Impact of nurse/doctor staffing ratios (per shift) and skill mix on mortality/cardiac arrests and ICU admissions. Impact of ICU bed availability on mortality/cardiac arrests and ICU admission rates Are hospital inpatients getting sicker, older and more comorbid? National acuity of all inpatients e.g. NEWS on admission, highest NEWS during emergency admissions. What is the predictive value of NEWS at GP, care home, district nursing, ambulance, out of hours assessment and subsequent outcomes. Does a low score equate to good outcomes in community and hospital environments? What are the soft signs of deterioration (e.g. walking, altered behaviour, concern) that should be part of training and pathways of care? what is the impact of non touch systems at calculating NEWS2 e.g. lifelight http://www.xim.ai/lifelight/ what biomarkers predict death? https://www.nice.org.uk/advice/mib195/chapter/Clinical-and-technical-evidence Do community-ambulance-hospital aligned systems using the same EWS produce better outcomes than those that are not? What is the impact of electronic health records and e obs systems on mortality, morbidity, ICU admissions, cardiac arrest and length of stay?

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		No group has ever been able to demonstrate the value of CCOT. Impact of nurse/doctor staffing ratios (per shift) and skill mix on mortality/cardiac arrests and ICU admissions. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4762154/ https://www.ncbi.nlm.nih.gov/books/NBK534527/ Impact of ICU bed availability on mortality/cardiac arrests and ICU admission rates Are hospital inpatients getting sicker, older and more comorbid? National acuity of all inpatients e.g. NEWS on admission, highest NEWS during emergency admissions. What is the predictive value of NEWS at GP, care home, district nursing, ambulance, out of hours assessment and subsequent outcomes. Does a low score equate to good outcomes in community and hospital environments? What are the soft signs of deterioration (e.g. walking, altered behaviour, concern) that should be part of training and pathways of care? https://wessexahsn.org.uk/img/projects/Soft%20Signs%20Taxonomy%20(Interserve%20-%20WPSC).docx https://www.westhampshireccg.nhs.uk/restore-2 what is the impact of non touch systems at calculating NEWS2 e.g. lifelight http://www.xim.ai/lifelight/ what biomarkers predict death? https://www.nice.org.uk/advice/mib195/chapter/Clinical-and-technical-evidence	What is the benefits of a regional (or national) interlinked digital system that enables all HCPs to visualise patient information from the whole pathway. Is there added value from continuous vital signs monitoring, and which patients benefit the most? Which systems combining vital signs and biochemical tests show the most promise? What is the potential benefits of machine learning, artificial intelligence systems to signal those patients most at risk of deterioration and death? Thank you for the suggested research recommendations. Please note that there is a NICE digital health technology pilot in progress for the Lifelight First technology. As the guideline is not being updated at this time, we cannot add the suggestions into the guideline now but will note them on the guideline issues log for future consideration. We will promote the current guideline research recommendations with the NIHR.

		(NB ProADM appears to predict all cause mortality quite well, not just infection) Do community-ambulance-hospital aligned systems using the same EWS produce better outcomes than those that are not? What is the impact of electronic health records and e obs systems on mortality, morbidity, ICU admissions, cardiac arrest and length of stay? What is the benefits of a regional (or national) interlinked digital system that enables all HCPs to visualise patient information from the whole pathway. Is there added value from continuous vital signs monitoring, and which patients benefit the most? Which systems combining vital signs and biochemical tests show the most promise? What is the potential benefits of machine learning, artificial intelligence systems to signal those patients most at risk of deterioration and death?	
PMD Device Solutions Limited	Yes	No comment	Thank you for your response. We note that you consider that the research recommendations in this guideline are still valid.
Royal Berkshire NHS Foundation Trust	Yes	No comment	Thank you for your response. We note that you consider that the research recommendations in this guideline are still valid.
The Royal College of Physicians and Surgeons of Glasgow		'See above' However, the College is concerned that there are still issues in this important area where deteriorating patients are not detected early enough or patients are simply not monitored.	Thank you for your response. We note that you agree with the proposal to not update the guideline. We can confirm that we did not restrict our consideration of evidence to the NHS in England. We included both UK-based and

		The committee has looked only published evidence rather than where care has not been optimal. Datix reports especially “Never events” have not been reviewed. HM Coroner’s inquest data have not been reviewed. Great emphasis is placed on the EWS whereas what is important is that it heralds clinical review. EWS can miss deteriorating patients. This is not discussed. An example would be a neuro-musculo-junction problem where patients vital signs are preserved and the patient does not appear breathless eg Dermato_ or Polymyosiits or Myasthenia etc. There is only a brief mention of HSIB review.	non-UK-based studies in our summary of evidence. We also considered a range of sources of evidence in addition to published evidence, including feedback from topic experts and related documents (for example, we included a relevant report cited by the topic expert issued by the Healthcare Safety Investigation Branch [HSIB]. We included the key points from the HSIB report). Surveillance reviews do not routinely consider Datix reports or HM Coroner’s inquest data. Thank you for noting the potential limitations of early warning scores. We have taken care to report the predictive performance of these tools. Some included studies were performed in specific study populations (e.g. with respiratory conditions) and these details were noted in the summary of evidence. We have considered all stakeholder feedback in detail but retain our proposal to not update the guideline at this time.
Royal College of Physicians of London	No	These should: • Be broadened to evidence of the use of track and trigger systems outside hospitals. • Include research into the implementation of track trigger and response systems • Include the effect of track and trigger systems on clinical workload. Include the role of patients and families in use of track and trigger systems	Thank you for your response. We note that you do not consider that the research recommendations in this guideline are still valid. You comment that research recommendations should: • be broader to include evidence on the use of track and trigger systems outside hospitals. • include research into implementation of track and trigger and response systems • include the effect of track and trigger systems on clinical workload • include the role of patients and families in the use of track and trigger systems .

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			Thank you for the suggested research recommendations. As the guideline is not being updated at this time, we cannot add the suggestions into the guideline now but will note them on the guideline issues log for future consideration. We will promote the current guideline research recommendations with the NIHR.
Society for Acute Medicine	No comment	No comment	Thank you for your response.
Intensive Care Society	Yes	No comment	Thank you for your response. We note that you consider that the research recommendations in this guideline are still valid.
UK Renal Association	Yes, but with comments	I would note that NEWS2 dropped urine output as a parameter for monitoring: In their final report the NEWS2 group stated: p 42 The monitoring of urine output is important in many clinical situations. However, formal estimation of urine output is not always available at first assessment, and measurement of urine output is not routinely required for the majority of patients in hospital. The NEWS Development Group did not consider it practical or necessary for formal monitoring of urine output to be part of the scoring system for the NEWS. That said, we recognise that urine output monitoring is essential for some patients as dictated by their clinical condition. and on p 74: Urine output is not part of the NEWS scoring system. Yes the NEWS chart can be used in this patient group. It is important to note, however, that the recording of urine output is often important clinically to monitor fluid balance but it is not required for the NEWS. I partially disagree with the dropping of urine output from NEWS2. I note the NEWS2 chart includes a tick box for	Thank you for your response. We note that you consider that the research recommendations in this guideline are still valid. You comment that urine output was not included in NEWS2 as a parameter for monitoring. You also flag that the NEWS2 chart has a tick box for urine output to prompt the question of whether the patient has passed urine. Since you state that this approach is based on opinion rather than evidence you indicate that further research (to inform parameters to be measured in specific clinical circumstances) should be conducted in patients with/at high risk of acute kidney injury (outside critical care) to compare outcomes using NEWS2 and either: i) no urine output monitoring in higher risk patients, ii) use of the tick box approach (described above), iii) use of standardised urine output monitoring in acutely ill patients. Thank you for your suggested research recommendation. The potential inclusion of urine output in NEWS2 is a relevant issue for

		urine output, typically used to prompt the question to the patient “Have you passed urine?” However, none of this is evidence based, it is opinion based. So, under “Parameters to be measured in specific clinical circumstances”, further research should be in patients with/at high risk of acute kidney injury, outside critical care, comparing outcomes using NEWS2 and either: i. No urine output monitoring in higher risk patients; ii. Use of the tick box approach (as above); iii. Use of standardised urine output monitoring in the acutely ill.	the developers of this tool to consider. As the guideline is not being updated at this time, we cannot add this suggestion into the guideline now but will note this on the guideline issues log for future consideration. We will promote the current guideline research recommendations with the NIHR.
Royal College of Nursing	Yes	No comment	Thank you for your response. We note that you consider that the research recommendations in this guideline are still valid.