Rethinking early warning scores

Dr Stephanie Heys, Susan Rhind, Camella Main and Daisy Pegler discuss misplaced metrics when caring for pregnant and recently pregnant women in pre-hospital care.

Despite escalating global concern around the high rates of morbidity and mortality in pregnant patients, the early signs of clinical deterioration in pregnant patients often go unrecognised, particularly in the pre-hospital environment (Ebert et al, 2020; McCullough et al, 2024). A critical, yet underappreciated, contributing factor is the application of generic early warning scores, such as the National Early Warning Score 2 (NEWS2). The NEWS2 has been applied with a blanket approach in the pre-hospital setting without considering groups of patients where they are not validated, such as pregnancy and immediately following pregnancy.

Maternal mortality in the UK is rising in specific populations, notably Black and Asian women and those from socioeconomically deprived backgrounds (Felker et al, 2024). These concerning disparities emphasise the blind spots created when additional complexities are not understood and there is no specified risk scoring for high-risk populations (Jardine et al, 2021). Current risk assessment tools and models do not adequately account for the intersection of ethnicity, deprivation and other social determinants of health (Vousden et al, 2024). While known risk factors do not fully explain the observed disparities, the lack of nuanced, individualised risk scoring for high-risk populations has been identified as limiting the effectiveness of targeted interventions in this population (Knight et al, 2022).

While maternal safety remains a key benchmark of health system performance, preventable deaths and severe morbidity persist in high-income settings (Illingworth et al, 2024). Barriers such as language, cultural differences, social isolation and limited access to healthcare further complicate care for women from minority ethnic and deprived backgrounds. These factors contribute to underuse of antenatal services and often result in an overreliance on urgent and emergency care providers (Heys et al, 2023). Typically, subtle signs of clinical deterioration begin before hospital arrival, making pre-hospital assessment a critical component of ensuring safe and appropriate care for these high-risk women.

The continued use of NEWS2 or other variations of warning scores in maternity cases represents a misalignment of clinical governance and physiological reality in this high-risk population. This article highlights a promising alternative: the pre-hospital maternity decision tool (Joint Royal Colleges Ambulance Liaison Committee. Association of Ambulance Chief Executives, 2024), which has been implemented in UK ambulance service guidelines and incorporates Maternal Early Warning Score (MEWS) parameters. Urgent evaluation of scoring practices is needed to reduce avoidable harm in pre-hospital maternity care and this tool could be used in alternative emergency care settings, in the UK and global healthcare settings.

Early warning scores: a physiological mismatch

Early warning scores are widely used to risk stratify the potential for patient deterioration and expedite timely intervention (Treacy et al, 2022). NEWS2 is an effective tool developed by the Royal College of Physicians and used across NHS hospitals and ambulance services to identify deterioration in non-pregnant adults (Shaw et al, 2017). However, it does not account for physiological changes during pregnancy, including increased heart rate, lowered systemic vascular resistance, altered respiratory patterns and plasma volume expansion (Kepley et al, 2023). While normal during pregnancy, these adaptations often exceed the NEWS2 normal ranges, leading to either inaccurate results or, catastrophically, missed signs of clinical deterioration, as maternal collapse may present subtly.

Research shows that abnormal vital signs precede 80–85% of medical emergencies (Le Lagadec and Dwyer, 2017), but without tools that interpret these signs in the context of pregnancy, opportunities for early intervention are often missed. The MEWS is recommended in anaesthetic and obstetric literature, and was designed to flag deviations from expected maternal physiology, helping to distinguish between adaptation and pathology (Gerry et al, 2024).

The pre-hospital blind spot

Ambulance clinicians are uniquely positioned to detect early deterioration in high-risk patients. However, they operate in dynamic and challenging environments with limited exposure

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to maternal clinical presentations and are dependent on clinical assessment tools, which are not tailored to account for pregnant physiology. As frontline providers, ambulance clinicians require clear, validated frameworks that prioritise clinical safety and system efficiency. Vulnerable pregnant patients who are at risk of health inequalities and/or have comorbidities are more likely to call for an ambulance at the point of deterioration, as a result of issues accessing healthcare, resulting in reliance on emergency and urgent care services (Heys et al, 2023).

In most ambulance trusts, NEWS2 is embedded in electronic patient care records. It is a mandated requirement in some ambulance services and across emergency departments. When NEWS2 scoring is used in pregnant women, this disconnect has tangible consequences; complications such as maternal sepsis, pre-eclampsia and haemorrhage may manifest in subtle changes in clinical observations. Use of generic scoring tools leads to unrecognised clinical deterioration, under triage and delayed care (Knight et al, 2021; 2022; Felker et al, 2024). Knight et al (2022) noted several maternal deaths in which early warning tools failed to prompt escalation or were misinterpreted, subsequently making recommendations for maternity-specific recognition systems across care settings (Felker et al, 2024).

Introducing a new decision tool

The National Prehospital Maternity & Neonatal Care Group has developed and published the Prehospital Maternity Decision Tool to support effective maternal assessment, triage, escalation and referral. The tool integrates MEWS-based parameters into a clear framework tailored for use by ambulance services. The design used frameworks from NHS England (2021) Maternal Medicine Networks to align with the Royal College of Obstetricians and Gynaecologists and recommendations from the MBRRACE reports. It also complements the National Institute for Health and Care Excellence (2021; 2023) guidance on antenatal and intrapartum care, supporting standardised risk recognition across the care continuum.

The tool differs from traditional scoring systems in several key ways. It:

- Anchors clinical judgement in pregnancy-specific physiological norms
- Incorporates obstetric red flags (eg abdominal pain, vaginal bleeding, pre-eclampsia)
- Incorporates MEWS parameters into pre-hospital care thereby promoting standardisation
- Acknowledges the adapted approach needed in pre-hospital care because of limited diagnostics, fetal monitoring, delivery capability, resources and expertise.

Preliminary feedback suggests improved clinician confidence and decision making in maternity cases, although this has not yet been published. Although formal evaluation and digital integration is ongoing, its publication in the Joint Royal Colleges Ambulance Liaison Committee and Association of Ambulance Chief Executives (2022) marks a critical step toward addressing pre-hospital maternal risk.

Systemic implications and the case for change

Failing to adapt early warning tools for pregnancy reflects a broader neglect of maternity-specific needs in urgent and emergency care. While maternity services increasingly use the nationally recommended MEWS score (Gerry et al, 2024), ambulance services and emergency departments are discordant with this approach. This gap contributes to fragmented risk assessment and inconsistent clinical handover, and places clinicians in ethically complex positions where institutional concordance may conflict with clinical intuition. These consequences are compounded by health inequities, with delays in recognition and escalation cited as contributory factors. A one-size-fits-all approach exacerbates these disparities, with focus needed on how to adopt an individualised and competent assessment for at-risk populations, both in maternity care across the healthcare system.

There is a need for national leadership to:

- Mandate the use of pregnancy-specific MEWS parameters to assess pregnant and recently pregnant patients in all care settings
- Ensure MEWS-based early warning tools are digitally integrated to support application of the tool, documentation, governance and evaluation
- Commission research into the impact of these tools on clinical outcomes across urgent and emergency care settings.

Pre-hospital risk stratifying tools have implications far beyond individual decisions, by influencing how systems identify and mitigate risk across patient cohorts The absence of structured tools makes escalation dependent on individual clinical judgement. While this autonomy is necessary, it creates variability and risk. The maternity tool provides a shared language between pre-hospital and in-hospital clinicians, enhancing communication and coordination. As ambulance services grow their clinical footprint in urgent and emergency care, integrating maternity considerations into education, digital systems and governance is essential to ensure risk mitigation.

Next steps

The Prehospital Maternity Decision Tool requires formal evaluation. Key research questions include:

- How accurately does the tool predict clinical deterioration compared to NEWS2 in the pre-hospital setting?
- What are its effects on decision making, triage and handover?
- Does the tool impact maternal and neonatal outcomes?

Implementation approaches could evaluate acceptability, application and system integration. Randomised controlled trials, although challenging in the pre-hospital context, may be feasible using stepped-wedge designs.

Conclusions

Pregnancy is not a pathology, but failing to account for its unique physiology in early warning systems is a safety failure. The continued use of NEWS2 in maternity cases reflects systemic inertia rather than evidence-based practice. The introduction

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of the Prehospital Maternity Decision Tool represents a significant step forward but also highlights wider gaps in healthcare delivery. A national focus on early warning practices in urgent and emergency care settings is required, including prioritisation of pregnancy-specific tools alongside adequate education and training across ambulance services. Furthermore, investment is needed in research that bridges the gap between risk stratification and patient outcomes. For too long, the pre-hospital environment has been the weakest link in the maternal safety chain. It is time to strengthen it. **BJM**

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