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Original Article

Maternal Enhanced and Critical Care (MEaCC) in Yorkshire and the Humber: regional implementation of an enhanced maternal care pathway and data collection

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ABSTRACT

Enhanced Maternity Care (EMC) is a new standard of care for women who become unwell during or shortly after pregnancy. Yorkshire and the Humber Maternity Clinical Network established the Maternal Enhanced and Critical Care Group (MEaCC) to create regional guidance with a focus on maternity staff training, development of the MEaCC database and data collection. This article describes the introduction of the MEaCC and regional data collection.

Introduction

The mortality rate of pregnant or recently pregnant women in the UK is now rising on a background of increasing morbidity, reaffirming the requirement to improve recognition and response to deterioration in this group.[1]

In current practice, pregnant women who become critically ill are cared for in a variety of settings. Evidence for this includes the variable rate of obstetric admissions to critical care units around the country.[2] Historically, attempts have been made to provide elements of high dependency care on delivery suites but a national audit in 2014 demonstrated fewer than 50% of units were providing any high dependency care and only 7% trained and assessed midwifery competency to provide this care. The Ockenden report has highlighted the ongoing need for a core group of midwives to be trained in high dependency (enhanced) care and ensure they are available on labour ward at all times.[3]

In 2018, a report entitled "The Care of the Critically Ill Woman in Childbirth: Enhanced Maternal Care" was published.[4] This document was the first to define Enhanced Maternal Care (EMC), a new standard of care for women who become unwell during or shortly after pregnancy but do not require critical care. The Maternal Enhanced and Critical Care (MEaCC) Steering Group was established by Yorkshire and the Humber (Y&H) Maternity Clinical network to implement this guidance regionally.

Engagement

The Y&H Maternity Clinical Network oversees 17 maternity units, of varying sizes, which together provide care for 70 000 births per year, 10% of the total number of births in England. Through a series of early engagement visits, benchmarking and regional events, it became clear that units of different sizes had variable thresholds for transferring patients to critical care. That threshold depends on several factors including number of deliveries, how often staff care for sick women, and the physical proximity of the delivery suite to the critical care unit.

We achieved buy-in from all hospitals in the region by continuing to allow units to set their own threshold for transfer to critical care. The underlying principle is that a sick woman is managed by someone with the appropriate competency in the appropriate place in that hospital, rather than expecting all maternity units to provide the same elements of enhanced care.

Development of regional recommendations

The MEaCC Steering group has multidisciplinary representation from all units across the region. Regional recommendations are closely aligned to national EMC guidance, the key difference being the

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definition. National guidance defines EMC as "driven by a set of competencies required to care for women with medical, surgical or obstetric problems during pregnancy – peri- and postpartum – but without the severity of illness that requires admission to a critical care unit." The EMC midwifery competencies listed relate only to central venous access and arterial line management.[4] Rather than linking the definition to specific skills, we identified that EMC was necessary for all pregnant or recently pregnant women "at risk of their condition deteriorating, or those recently relocated from higher levels of care, whose needs can be met on an acute ward with additional advice and support from the critical care team". This is in line with the recent Intensive Care Society definition of level 1 enhanced care (Fig. 1).[5,6]

Models of enhanced maternal care

Models of enhanced care used across the region fall broadly into the three categories below. Each consultant-led unit has been tasked with developing multidisciplinary EMC guidance to define which patients can be cared for within their maternity setting and who needs to be transferred to critical care. This creates consistency around the decision to transfer to critical care within the hospital, rather than ad hoc decision-making dependent on the staff present on the day.

1. *Enhanced care provided by EMC midwives trained to care for invasive monitoring*

This model is in place in several large units across the region. Units aim to have EMC midwives available at all times to care for sick women, with sufficient throughput of women requiring invasive monitoring for midwives to maintain competence.

2. *Enhanced care provided by a registered nurse working alongside a midwife*

This model is in place in a large tertiary centre. Collaborative work means that staff have all the skills required to care for a sick woman at all times, with the potential for a higher threshold to transfer to critical care.

3. *Enhanced care provided by EMC midwives without training for invasive monitoring*

This model is in place in several smaller units across the region. Units aim to have EMC midwives available at all times to care for sick women but have chosen to have a lower threshold for transfer to critical care because the number of women requiring invasive monitoring is insufficient for midwives to maintain this competency. Given that these units are often in smaller hospitals, critical care and maternity are often in close proximity, meaning that access to maternity theatre, maternity and neonatal teams is maintained for those women requiring critical care.

Competency and training framework

Our framework is based on national recommendations, with additional input from hospitals and stakeholders across the region. Standard competencies apply to all midwives who care for women who may become unwell, focussing on initial recognition of deterioration, immediate management and escalation. Enhanced competencies are for band 6 and 7 midwives working in or supervising EMC.

The steering group has recommended established training courses that cover the required material with no additional licence fees. For standard competency we recommend maternal Acute Illness Management (AIM)[7] with Network funding agreed to purchase manuals for every midwife in the region. For enhanced care training we recommend the Practical Obstetric Multi-Professional Training: Care of the Critically Ill Pregnant or Postpartum Woman (PROMPT CiPP) module.[8] All hospitals in our region are already using PROMPT to provide multidisciplinary training so there is no additional cost. To achieve and maintain competence in enhanced skills, we recommend that EMC midwives spend time with critical care and outreach. The duration varies depending on the competencies the unit requires midwives

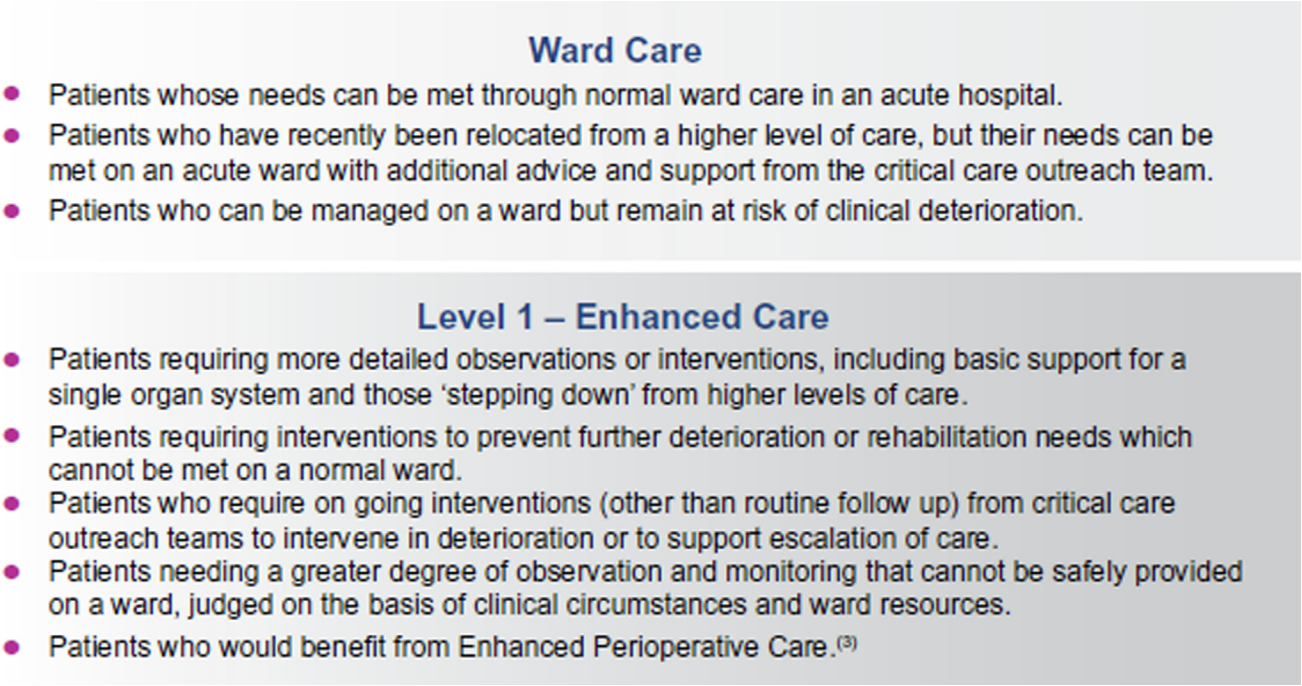

Fig. 1. Intensive Care Society levels of adult critical care: revised definition of Level 1/enhanced care[6]

to master. A competency passport has also been developed to record competencies achieved.[5]

MEaCC database development

Enhanced maternal care/obstetric high dependency unit (HDU) data are not currently collected in England as part of either the maternity services (MSDS) or Intensive Care National Audit and Research Centre (ICNARC) datasets. It is vital that this data is collected and analysed to better understand the care provided in each maternity unit and the outcomes of women and their babies. Given that units have such different thresholds for transfer to critical care, a recent national sprint audit of ICNARC data led by the National Maternal and Perinatal Audit (NMPA) concluded that "further investigation of methods to identify and monitor the number of women who become critically unwell in pregnancy birth or the postnatal period is required".[2]

The MEaCC dataset is based on that suggested in the 2018 national EMC document, with the addition of physiological variables from a variety of risk-prediction tools. A pilot of four maternity units informed the development of an online data portal utilising Net Solving Ltd.'s CaseCapture™ platform, funded by Y&H Maternity Clinical Network. The data portal has industry-standard security features with system-integrated pseudo-anonymisation. As only pooled, non-identifiable data is analysed, patient consent is not required, although any woman wishing to withdraw can do so. Information governance approved data sharing agreements are in place between participating organisations and the data controller, Bradford Teaching Hospitals NHS Foundation Trust.

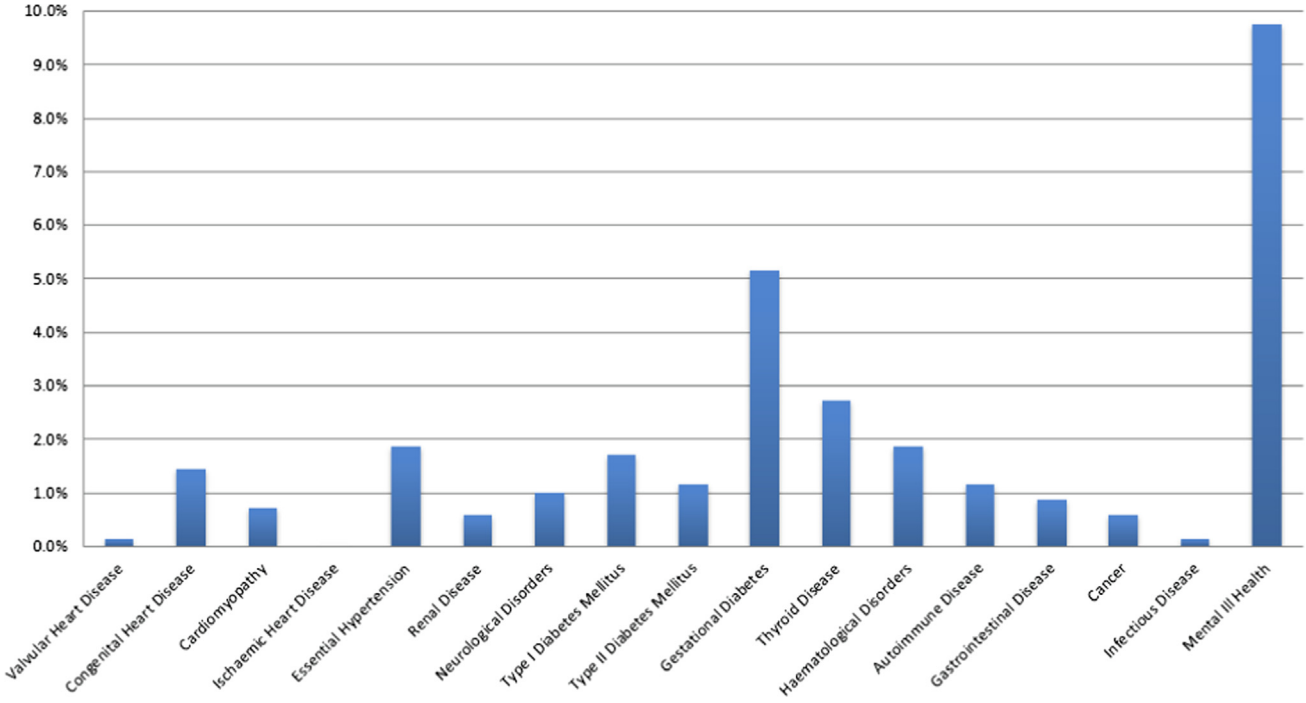

Fig. 2. Maternal comorbidities for women requiring maternal enhanced and critical care

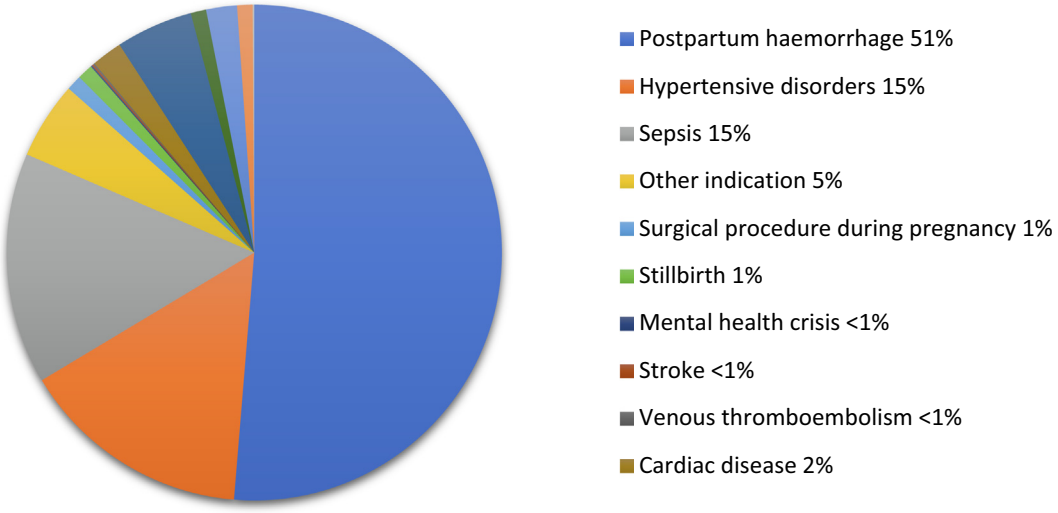

Fig. 3. Why do women require maternal enhanced and critical care?

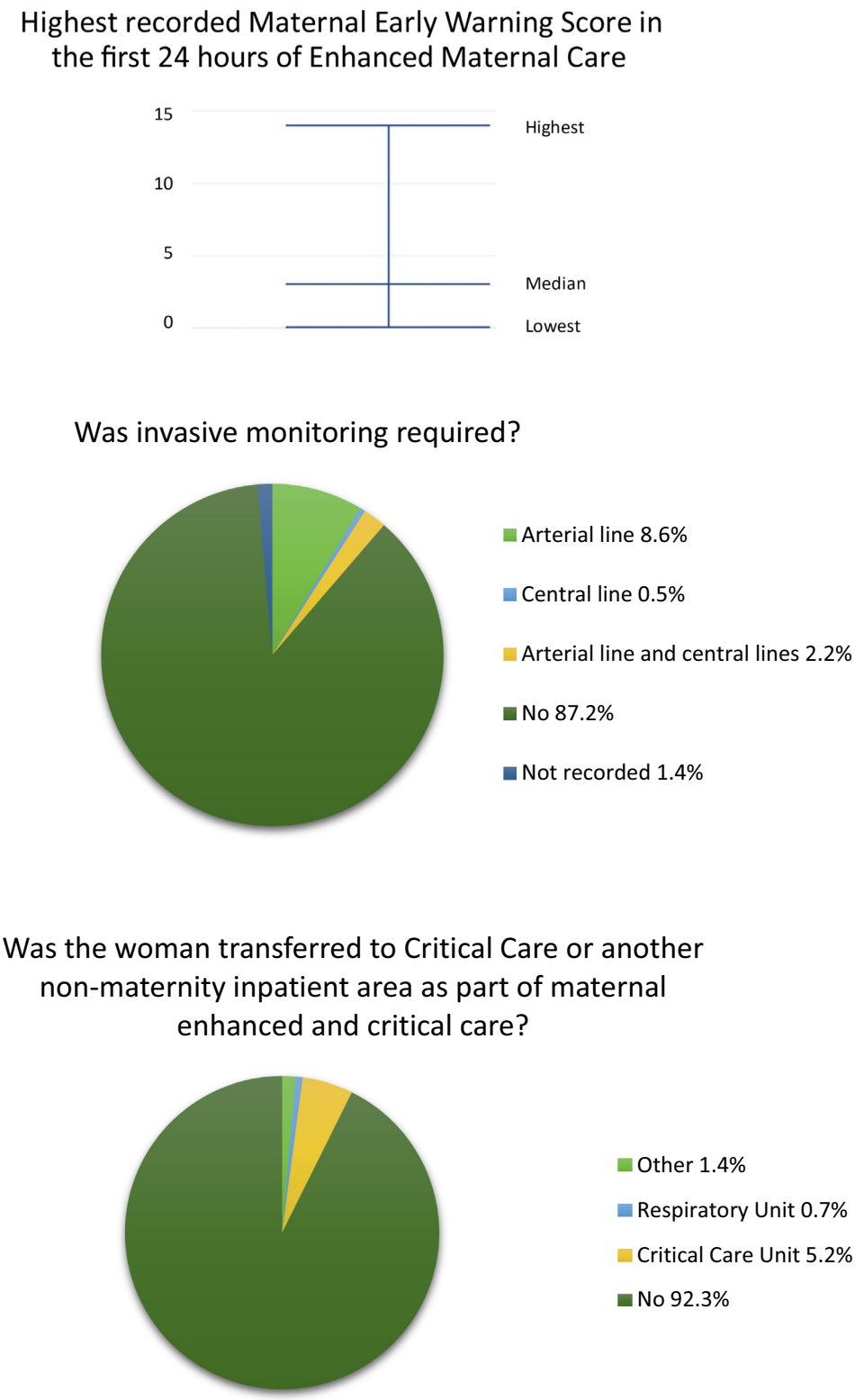

Fig. 4. How sick are women requiring maternal enhanced and critical care?

Data can be contemporaneously entered into the portal or collected on paper case report forms (CRF) prior to entry by the hospital's lead MEaCC midwife. A regional lead midwife (VD) provides bespoke data collection training and support as well as overseeing data validity and trouble shooting. The portal generates a real-time dashboard for individual units. The regional team can view the regional dashboard and produce quarterly reports for individual hospitals to use as a comparator.

What are the data telling us?

Since its inception in 2019 over 2000 cases have been entered, with all 17 units contributing data. Most women have no comorbidities at the time they become unwell (Fig. 2). Although the incidence of mental ill-health appears high, this reflects the incidence in the broader population and includes all mental health diagnoses and degrees of severity. The most frequent reason for requiring MEaCC is postpartum haemorrhage >1500 mL (Fig. 3). Many of these cases are managed and stabilised in theatre prior to requiring EMC for observation only, which may explain why the median highest Maternal Early Warning Score (MEWs) in the first 24 h after commencing MEaCC for all patients is low. Only 5% women required transfer to critical care and only 10% needed invasive monitoring across EMC and critical care, highlighting how infrequently EMC patients require invasive monitoring and supporting the decision for smaller units to transfer women requiring lines to a critical care facility (Fig. 4). It also supports the NMPA's findings that women cared for in critical care represent only a fraction of the women who become unwell during or after pregnancy.

Data have been used locally to inform business cases for additional staffing and training whilst on a regional level the data are informing quality improvement projects, the first of which relates to improving management of obstetric haemorrhage.

What next?

We now have funding to update the portal to include Maternal Medicine Network data and configure the system to allow other hospitals and Networks nationally to join us in contributing data. The National Emergency Laparotomy Audit (NELA) has led to a reduction in 30-day mortality in people undergoing emergency bowel surgery since 2013.[9] Whilst mortality is a poor outcome measure for pregnant and recently pregnant women, we are confident that if data were collected on a national scale, organisational structure, process and outcome measures could be compared. This data could then inform service delivery, aid service commissioning, support research (including risk prediction models) and reduce severe maternal morbidity and possibly maternal mortality.

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Declaration of interests

None declared.

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