



Maternity early warning system measurement guidance

This measurement guidance will support hospitals as they implement their maternity early warning system (MEWS) to monitor progress and identify areas for continuous quality improvement. The measures capture information on the processes of recognising and responding to clinical deterioration as well as outcomes at a hospital level. These calculations occur automatically in the *data collection tool*.

Collecting, analysing and reporting this information will help to identify how well changes are being embedded into clinical areas and where further improvement activity is needed. Additionally, it can be used to monitor the impact of these improvement efforts and strengthen local governance arrangements.

Information to be collected and reported

Information should be collected at the frequency identified below. We recommend that data collection starts two weeks before the implementation phase to establish the current baseline.

Share the results with ward staff as soon as possible. The results, with a commentary, should be reported to the local governance group each month. When reporting, it will be important to consider the ward acuity and staffing levels to provide context to the results.

Information	Source	Collection frequency
1. Structural data on the number of wards/clinical areas using the maternity early warning score	Project team	As happens
2. Process data on: <ul style="list-style-type: none"> appropriate frequency of vital sign monitoring completed core vital sign set correct calculation of total MEWS score modifications made to MEWS score triggers triggers for escalation escalation and response occurring according to local pathway completed documentation as per local policy. 	All through chart audit	Weekly
3. Outcome data on the number of pregnant or recently pregnant women escalated to emergency team (or equivalent), excluding intrapartum calls ¹	Switchboard or local collection	As happens
4. Outcome data on the number of pregnant or recently pregnant women admitted to intensive care or high dependency units	Patient management system	Monthly

¹ Obstetric emergency calls for problems such as shoulder dystocia, emergency breech presentation, cord prolapse and postpartum haemorrhage should be excluded.

There may be other measures that you may want to collect data for. Include these in the measurement section of the project charter. We encourage project teams to share their results with the national MEWS team via news@hqsc.govt.nz each month. The test sites found it helpful to have feedback on their results and ideas for areas to investigate further.

At this stage there is no requirement for these measures to be reported nationally as quality and safety marker measures.

Data collection

Project teams should keep a record of when wards and clinical areas start using the maternity early warning score through the maternity vital signs chart (MVSC) or an electronic system. This could simply be a table containing a list of all the relevant wards and clinical areas with space to add the date that they start.

Project teams will need to identify how to collect data for the two outcome measures. This may be through switchboard or by local collection through the teams involved. This may already be done, otherwise the method for collecting will need to be established during the preparation period.

An audit form and data collection tool have been developed to aid data collection for the process measures. The tools involve the collection of information from the MVSC and clinical records.

Before starting an audit, we recommend that a data collection plan is developed. Agreement on the following is needed:

- Sampling: a random sampling strategy is recommended. Project teams can choose the sampling strategy but should ensure that the sample is representative of the ward or hospital population.
- Sample size and frequency of data collection: From a quality improvement perspective, we recommend that each clinical area audits 10 women per week as part of initial implementation (the first four to six months), until the changes are embedded and the audit data shows evidence of sustained improvement. This will give teams sufficient data points, in a short period of time, to observe a change in the processes and identify further improvement areas.

We recognise that some teams will struggle to achieve the recommended sample size and frequency due to a variety of reasons. Reducing the sample size and time between data collections will reduce the number of data points and lengthen the period of time that teams can observe a change in processes. However, any auditing needs to be practical for project teams and ward staff.

Auditing also provides a further opportunity for project team members and champions to provide on-the-spot education and feedback to staff in clinical areas on how they are using the MVSC and local escalation pathways. During our testing of the MVSC, we found that ward staff were very appreciative of regular feedback on both where they are doing well and where they could improve.

Once the MEWS is stable and well embedded, the project team and governance group can decide whether the audit frequency and sample size can be reduced.

Data analysis and reporting

An Excel data collection tool has been created to help hospitals collate and analyse their process and outcomes data. There are dashboards and graphs that automatically populate once data has been entered. We suggest that project teams regularly review the dashboards and graphs to identify areas where focused attention needs to be placed. Guidance on how to enter data into the tool is provided on the front page of the tool.

Give staff feedback on the audit in the clinical areas so that they know how they are doing, can celebrate their achievements and engage in the discussion on how improvements can be made.

Regularly share the results with the clinical governance group responsible for MEWS. They will be able to review areas for improvement and assist with championing these improvements. When reporting, it will be important to consider the ward acuity and staffing levels to provide context to the results and suggesting improvements.

The Commission's MEWS programme team can provide additional support to help you use the tools, develop data collection plans, interpret and make sense of what the data is showing. You can also seek assistance from your local IT or business clinical intelligence team, or contacts from the MEWS test sites. Please contact the national team via news@hqsc.govt.nz for more information.

Definitions of measures

1. Percentage of wards/clinical areas using the maternity early warning score	
Definition	This measures the progress to implement the maternity early warning system into appropriate wards or clinical areas. A ward or clinical area that cares for adult inpatients where a general observation chart would usually be in use and where pregnant or recently pregnant women may be admitted. The maternity early warning score is found on the national MVSC and can be incorporated into electronic vital signs charting systems.
Numerator	Number of wards or clinical areas using MVSC
Denominator	Number of eligible wards or clinical areas
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

2. Percentage of women receiving appropriate frequency of vital sign monitoring	
Definition	This measures the frequency of vital sign monitoring. The appropriate frequency may be determined by the organisational minimum standard, the escalation pathway, procedural requirements (eg, postoperative vital sign policies) or documented in the plan of care.
Numerator	Number of audited charts with appropriate frequency of vital sign monitoring (yes responses for question 1 of the data collection tool)
Denominator	Total number of audited charts
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

3. Percentage of women with completed core vital sign set for the most recent set of vital signs	
Definition	This measures whether all the core vital signs were recorded in the most recent vital signs set. The core vital sign set includes all the vital signs required to calculate the early warning score (respiratory rate, oxygen requirement, oxygen saturation, heart rate, systolic and diastolic blood pressures, temperature, level of consciousness).
Numerator	Number of audited charts with completed core vital sign set (yes response for question 2 of the data collection tool)
Denominator	Total number of audited charts
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

4. Percentage of recorded core vital signs

Definition	This measures which core vital signs were recorded. This allows opportunity for focused education on frequently-absent vital signs. The core vital signs are respiratory rate, oxygen requirement, oxygen saturation, heart rate, systolic and diastolic blood pressures, temperature, level of consciousness.
Numerator	Number of audited charts with recorded vital signs for questions 2 and 2a–2h (yes response for each of the questions 2a–2h of the data collection tool)
Denominator	Total number of audited charts
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$ for each vital sign

5. Percentage of women with most recent total MEWS score calculated correctly

Definition	This measures the correct calculation of the maternity early warning score. This can only happen when there is a complete core vital sign set (yes response to question 2), the score has been calculated correctly and any valid modification has been correctly applied to the calculation.
Numerator	Number of audited charts with most recent total MEWS score calculated correctly (yes response to question 3 of the data collection tool)
Denominator	Total number of audited charts
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

6. Percentage of women with modification made to MEWS score triggers

Definition	This measures the percentage of modifications made to the MEWS score triggers. Modifications must be documented in the modifications box on the MVSC (or electronic equivalent).
Numerator	Number of audited charts with modification made (yes response to question 4 of the data collection tool)
Denominator	Total number of audited charts
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

7. Percentage of women with clinical requirements recorded for modifications

Definition	This measures the percentage of modifications that had clinical requirements recorded. The modification entry must have the clinical requirements recorded: vital sign, rationale and duration for modification.
Numerator	Number of audited charts with modifications that met clinical requirements (yes response to question 4a of the data collection tool)
Denominator	Number of audited charts with modification made (yes response to question 4 of the data collection tool)
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

8. Percentage of women with documentation requirements recorded for modifications

Definition	This measures the percentage of modifications that had documentation requirements recorded. The modification entry must have the documentation requirements recorded: legible date, signature and contact details.
Numerator	Number of audited charts with modifications that met documentation requirements (yes response to question 4b of the data collection tool)
Denominator	Total number of audited charts
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

9. Percentage of women that triggered an escalation from a single parameter trigger or a total MEWS score of five or more

Definition	This measures the triggers for escalation for women that had a total MEWS score of 5 or more or a single parameter trigger in the pink or blue zone in the 24-hour audit period.
Numerator	Number of audited charts that triggered an escalation (yes response to question 5 of the data collection tool)
Denominator	Total number of audited charts
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

10. Percentage of women that triggered an escalation for whom the escalations occurred as per pathway

Definition	This measures how many of those women that triggered an escalation had their care escalated according to the agreed pathway. If more than one escalation was triggered in the 24-hour audit period, the most recent trigger is to be included in the audit.
Numerator	Number of audited charts that had an escalation occur according to the pathway (yes response to question 5a of the data collection tool)
Denominator	Number of audited charts that triggered an escalation (yes response to question 5 of the data collection tool)
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

11. Percentage of women that triggered an escalation for whom the response occurred as per pathway

Definition	This measures how many of those women that triggered an escalation received the appropriate response to that escalation according to the agreed pathway. If more than one escalation was triggered in the 24-hour audit period, the most recent trigger is to be included in the audit.
Numerator	Number of audited charts that had a response occur according to the pathway (yes response to question 5b of the data collection tool)
Denominator	Number of audited charts that triggered an escalation (yes response to question 5 of the data collection tool)
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

12. Percentage of women that triggered an escalation for whom the responder completed documentation as per local policy

Definition	This measures how many of those women that triggered had documentation completed as per local policy by the responder. If more than one escalation was triggered in the 24-hour audit period, the most recent trigger is to be included in the audit.
Numerator	Number of audited charts where the responder completed documentation requirements (yes response to question 5c of the data collection tool)
Denominator	Number of audited charts that triggered an escalation (yes response to question 5 of the data collection tool)
Calculation	$(\text{Numerator}/\text{denominator}) \times 100$

13. Number of escalations to emergency team (or equivalent)

Definition	<p>These escalations are triggered by: a total MEWS score of 10+ or any vital sign in the blue zone. These escalations may (or may not) be accompanied by an escalation to the hospital's rapid response team (or equivalent).</p> <p>Best collected through a review of switchboard call records or directly collected by the emergency team (excluding intrapartum emergency calls).</p>
Calculation	Number of escalations per month

14. Number of pregnant or recently pregnant women admitted to intensive care or high dependency units

Definition	Best collected through your patient management system using the following criteria: Admissions to ICU or HDU with any diagnosis of O00-O99, Z34, Z35 (ICD-10).
Calculation	Number of admissions per month