The Irish Maternity Early Warning System (IMEWS)
National Clinical Guideline No. 4

Summary

November 2014
Guideline Development Group
The National Clinical Guideline was developed by a Guideline Development Group from the Clinical Strategy and Programmes Division, Health Service Executive as a collaborative project between the Office of Nursing and Midwifery Director and the National Clinical Programme in obstetrics and gynaecology. Professor Michael Turner, National Clinical Lead, National Clinical Programme for Obstetrics and Gynaecology chaired the Guideline Development Group.

The guideline was first published as an obstetrics and gynaecology clinical programme guideline in June 2013. It was subsequently updated by Dr Karen Power and Dr Patrick Maguire, under the aegis of the National Clinical Programme for Obstetrics and Gynaecology, to include a customised Sepsis 6 Box and to align it with other national EWS guidelines, and the revised version published in July 2014. The support of the Clinical Effectiveness Unit, Department of Health is acknowledged (Dr Kathleen Mac Lellan and Dr Mary O’Riordan) in developing this guideline further to become a National Clinical Guideline quality assured by the NCEC.

Using this National Clinical Guideline
This guideline is relevant to all healthcare professionals involved in the hospital in-patient care of a woman with a confirmed clinical pregnancy and up to 42 days in the postnatal period irrespective of age, location or reason for admission. The full version of the National Clinical Guideline is available on the following websites:

www.health.gov.ie/patient-safety/ncec
http://www.hse.ie/eng/about/Who/clinical/natclinprog/obsandgynaeprogramme/imews
http://www.rcpi.ie

Recommendations are presented with practical guidance. The recommendations are linked to the best available evidence and/or expert opinion using the grades for recommendations outlined in Section 1.5. The National Clinical Guideline recommendations have been cross-referenced where relevant with other National Clinical Guidelines.

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Disclaimer
Healthcare staff should use clinical judgement and medical, midwifery and nursing knowledge in applying the general principles and recommendations in this guideline. Recommendations may not be appropriate in all circumstances and the decision to adopt specific recommendations should be made by the clinician taking into account the individual circumstances presented by each patient and available resources. The National Clinical Guideline recommendations do not replace or remove clinical judgement or the professional care and duty necessary for each specific patient case. Clinical decisions and therapeutic options should be discussed with a senior clinician on a case-by-case basis as necessary.
The National Clinical Effectiveness Committee (NCEC) is a Ministerial committee established as part of the Patient Safety First Initiative. The NCEC role is to prioritise and quality assure National Clinical Guidelines and National Clinical Audit so as to recommend them to the Minister for Health to become part of a suite of National Clinical Guidelines and National Clinical Audit.

National Clinical Guidelines which have been quality assured and recommended by NCEC for implementation provide robust evidence-based approaches to underpin or define models of care as appropriate. They provide guidance and standards for improving the quality, safety and cost-effectiveness of healthcare in Ireland. The implementation of clinical guidelines can improve health outcomes, reduce variation in practice and improve the quality of clinical decisions.

NCEC Terms of Reference
- Apply criteria for the prioritisation of clinical guidelines and audit for the Irish health system
- Apply criteria for quality assurance of clinical guidelines and audit for the Irish health system
- Disseminate a template on how a clinical guideline and audit should be structured, how audit will be linked to the clinical guideline and how and with what methodology it should be pursued
- Recommend clinical guidelines and national audit, which have been quality assured against these criteria, for Ministerial endorsement within the Irish health system
- Facilitate with other agencies the dissemination of endorsed clinical guidelines and audit outcomes to front-line staff and to the public in an appropriate format
- Report periodically on the implementation of endorsed clinical guidelines.

In response to the HIQA Patient Safety Investigation Report into Services at University Hospital Galway (2013), the NCEC was requested by the Minister for Health to commission and quality assure a number of National Clinical Guidelines. The National Clinical Guideline for a maternity early warning system is one of these guidelines. The National Clinical Guideline – Irish Maternity Early Warning System has been quality assured by NCEC and endorsed by the Minister for Health for implementation in the Irish health system.

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Background

1.1 Need for a National Clinical Guideline

Critical illness is an uncommon but potentially devastating complication of pregnancy. It may be devastating, not only for the woman who becomes ill, but also for her family and for those healthcare professionals responsible for her care. At its most extreme, critical illness may lead to the death of the woman during pregnancy or shortly afterwards. The Confidential Maternal Deaths Enquiry published in 2012 confirmed that Ireland continues to have a low maternal mortality ratio by international standards. There is, however, no room for complacency and efforts to improve the quality of clinical care in the maternity services must continue.

As critical care has evolved worldwide, attempts to identify early the clinically deteriorating patient has led to the introduction, in hospitals, of early warning scores and systems. In Ireland, this has led to the National Early Warning Score (NEWS) being developed in collaboration with the HSE Acute Medicine Clinical Care Programme. The NEWS was the first National Clinical Guideline to be approved by the NCEC and it was endorsed and launched in February 2013 by the Minister for Health. The NEWS is applicable to adult patients and is not applicable to pregnant women.

The HSE Clinical Strategy and Programmes strategic plan for the acutely ill patient in obstetrics and gynaecology has been pro-active in developing a clinical practice guideline - the Irish Maternity Early Warning System (IMEWS). This maternity early warning system provides guidance and processes for the early detection of life threatening illness in pregnancy and up to 42 days in the postnatal period. The first version was published in June 2013 and it was updated in July 2014.

In response to the HIQA Galway Report (2013), the NCEC was requested by the Minister for Health to commission and quality assure a number of National Clinical Guidelines. A maternity early warning system is one of these guidelines. In collaboration with the HSE Clinical Strategy and Programmes and Quality and Patient Safety divisions the clinical practice guideline IMEWS was developed to the status of a National Clinical Guideline quality assured by the NCEC.

A systematic clinical literature review was commissioned. This identified that a maternity early warning score system does appear to improve recording of observations. Relatively little high quality evidence on developing and testing the predictive ability of maternity early warning scores emerged. The literature is in the main related to selected high-risk populations using mortality or severe morbidity outcomes. Studies included found a wide variation in predictive components depending on the maternity early warning score used. This limits the extent of evidence available to inform decisions on implementation of MEWS routinely on an unselected maternity population. The content and grade of recommendations for the National Clinical Guideline (IMEWS) therefore reflects the strength of evidence and the expert consensus opinion of the Guideline Development Group.

This guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach across all hospital maternity services in Ireland. A standard national patient observation chart and escalation triggers are recommended. Clinical material in this guideline does not replace or remove clinical judgement or professional care and duty. Clinical decisions and therapeutic options should be discussed with a senior clinician on a case-by-case basis as necessary.
The IMEWS patient observation chart is purple and contains a pregnancy silhouette to distinguish the chart from the NEWS. The colour coding for triggers/escalation on the IMEWS is aligned as closely as possible with the NEWS.

Regular audit of not only implementation but also impact of the National Clinical Guideline should occur as the guideline is being implemented across all relevant services.

1.2 Critical illness in maternity care

Critical illness in pregnancy may be due to conditions unique to pregnancy, due to conditions exacerbated by pregnancy or due to coincidental conditions. This is reflected in the classification of maternal deaths into direct, indirect and coincidental deaths. The conditions unique to pregnancy include obstetric haemorrhage, pre-eclampsia/eclampsia, pulmonary embolism (venous and amniotic fluid), chorioamnionitis/endometritis, uterine rupture, placenta accreta and acute fatty liver.

It has been estimated that for every maternal death there are nine women who develop severe maternal morbidity. In a study of severe maternal morbidity for 2004/5 in the three Dublin maternity hospitals, the rate of severe maternal morbidity was 3.2 per 1,000 maternities. The commonest cause was haemorrhage. A national review of postpartum haemorrhage in Ireland over 11 years between 1999 and 2009, found that there were increasing rates of atonic postpartum haemorrhage.

1.3 Aim of National Clinical Guideline

The purpose of this guideline is to improve the management of the in-patient care of a woman with a confirmed clinical pregnancy and up to 42 days in the postnatal period through the use of a standard maternity early warning system.

1.4 Scope of National Clinical Guideline

This National Clinical Guideline relates to the hospital in-patient care of a woman with a confirmed clinical pregnancy and up to 42 days in the postnatal period irrespective of age, location or reason for admission. The National Clinical Guideline No. 1 NEWS is for utilisation for non-pregnant adults in gynaecological services.

This guideline is relevant to all healthcare professionals, who are working with hospital in-patient care of women with a confirmed clinical pregnancy and up to 42 days in the postnatal period, irrespective of age, location or reason for admission.

It is designed to guide clinical judgement but not replace it. In individual cases a healthcare professional may, after careful consideration, decide not to follow guideline recommendations if it is deemed to be in the best interests of the woman. Clinical decisions and therapeutic options should be discussed with a senior clinician on a case-by-case basis as necessary.

1.5 Grading of recommendations

The recommendations are followed by a grade. This is a consensus grade agreed by the Guideline Development Group. It reflects the strength of the evidence supporting the recommendation and discussion of the evidence amongst the Guideline Development Group. The system was agreed to best meet the needs of the guideline and the Guideline Development Group, given the absence of randomised controlled trials (RCTs) in many of the areas covered.
The grades are as follows:

**Grade A** – Evidence from a meta-analysis/systematic review of RCTs or from at least one RCT.

**Grade B** – Evidence based on one controlled trial without randomisation (e.g., cohort study) a quasi-experimental study, or extrapolated from RCT.

**Grade C** – Evidence from comparative studies, correlation studies, case control studies or extrapolated from category A or B.

**Grade D** – Evidence from expert committees, reports or opinions, the clinical experience of respected authorities, and the conclusions of the Guideline Development Group.

No recommendation.
# National Clinical Guideline recommendations

## 2.1 National recommendations

### Table 1 Summary of National Clinical Guideline (IMEWS) recommendations

<table>
<thead>
<tr>
<th>Section</th>
<th>Recommendation/Subsection</th>
<th>Recommendation Number</th>
</tr>
</thead>
</table>
| Measurement and documentation of observations | • The Irish Maternity Early Warning System (IMEWS) should be used for the in-patient care of a woman with a confirmed clinical pregnancy and up to 42 days in the postnatal period irrespective of age, location or reason for admission. **Grade C**  
• IMEWS should be used to complement clinical care and it is not designed to replace clinical judgment. Clinical concern about an individual woman should trigger a call to medical staff irrespective of the IMEWS. **Grade D**  
• The blood pressure (BP) should be measured with the correct cuff size. In women with a mid-arm circumference (MAC) > 33 cms, the use of a standard cuff may overestimate the BP and lead to unnecessary interventions. **Grade B**  
• Any fall in the level of consciousness (AVPU scale) should always be considered significant and acted on immediately. **Grade C**  
• The timing of clinical observations will depend on the woman’s individual clinical circumstances. **Grade D** | 1 2 3 4 5 |
| Clinical communication and escalation of care | • The ISBAR communication tool should be used when communicating information in relation to deteriorating and/or critically ill patients. Where a situation is deemed to be critical, this must be clearly stated at the outset of the conversation. **Grade B**  
• The designation of who should be the senior doctor called should be agreed locally by the midwifery and medical senior management. **Grade D**  
• Depending on the acute illness, early consideration should be given to seeking professional assistance from other medical specialties either within or from outside the maternity unit. **Grade D** | 6 7 8 |
| Suspected maternal sepsis | The Sepsis 6 Tool customised for pregnancy should be utilised for consideration of maternal sepsis. **Grade C** | 9 |
| Implementation ofIMEWS | • Organisational supports and governance structure  
• Education  
• Evaluation and audit | 10-12 13 14-16 |
2.1.1 Measurement and documentation of observations

The following are responsible for implementation of recommendation 1:
Doctors, Midwives and Nurses.

Recommendation 1
The Irish Maternity Early Warning System (IMEWS) should be used for the in-patient care of a woman with a confirmed clinical pregnancy and up to 42 days in the postnatal period irrespective of age, location or reason for admission.

The IMEWS should NOT be used for women in labour and women in high dependency, recovery and critical care settings. Vital signs for women in labour should be recorded on the partogram. The last set of vital signs for each of these areas should be documented on the IMEWS prior to transfer to the postnatal ward. Grade C

The following are responsible for implementation of recommendation 2:
Doctors, Midwives and Nurses.

Recommendation 2
IMEWS should be used to complement clinical care and it is not designed to replace clinical judgment. Clinical concern about an individual woman should trigger a call to medical staff irrespective of the IMEWS. Grade D

Practical Guidance
Completing the IMEWS
The nationally agreed IMEWS is included in Appendix 2. For convenience a sample antenatal observation sheet is included in Appendix 3 and a sample postnatal observation sheet is included in Appendix 4. These should be filed beside the IMEWS in the maternity chart so that all clinical observations are easily accessible to the different disciplines.

IF CONCERNED ABOUT A WOMAN, ESCALATE CARE REGARDLESS OF TRIGGERS

Total Yellow/Pink Scores
• All triggers should be added up and documented at the bottom of the IMEWS each time observations are recorded.
• If the woman scores any yellow or pink scores, the escalation process should be initiated (See section 2.1.2).
• The initials of the person that has completed and recorded the observations should be clearly written in the initials box on the IMEWS.
• An Initials/Signature Bank should be maintained in each hospital as per local guidelines.
Physiological observations for the IMEWS

Respiration

**Practical Guidance**

An assessment of respiration should be carried out for 60 seconds following the assessment of heart rate, as making the woman aware of counting her respirations will cause her to be conscious of her breathing and lead to a false reading. If the wrist is supported across the woman’s chest, it is possible to count the pulse and then to either feel the rise and fall of the chest, or observe it, counting respirations. Factors such as sound, depth and regularity are observed at the same time. If respirations are regular, the rate is counted for 30 seconds and doubled. If any abnormalities are detected, respiration is counted for a whole minute.

The rate should be documented as a numerical value in the appropriate box e.g. respiratory rate of 16 per minute should be documented numerically in the white box allocated to a respiratory rate of 11-19. Likewise, a respiratory rate of 20 should be documented numerically in the yellow box allocated to respiratory rate of 20-24.

The accepted normal parameters for respiration rate on IMEWS are 11-19 respirations/min.

Oxygen Saturation

**Practical Guidance**

- Oxygen saturation levels are not routinely measured on all women, and only measured in the following circumstances:
  - If the respiration rate is outside the normal parameters and within the ‘trigger’ pink or yellow values
  - If a medical/obstetric condition necessitates measurement of oxygen saturation levels e.g. respiratory disorder, High Dependency Care.

- Accuracy of the measurement depends on an adequate flow of blood through the light probe i.e. if peripheral circulation has shut down and a woman is in a critical condition, the SpO₂ result may be inaccurate or unobtainable.

- Artificial nails and nail polish will affect the accuracy of results.

- The SpO₂ should be documented as a percentage in the appropriate box i.e. SpO₂ of 94% should be documented numerically in the pink box allocated to SpO₂ readings of ≤95%. Likewise the SpO₂ of 96% should be documented numerically in the white box allocated to 96-100%.

- The accepted parameters for SpO₂ on IMEWS are 96-100%.
Temperature

**Practical Guidance**

- Temperature should be recorded at the appropriate site (i.e. oral, axilla, tympanic) according to local guidelines, ensuring correct use of the appropriate thermometer and equipment.

- The recorded temperature should be documented numerically in the appropriate box. Therefore, the temperature of 35.8°C should be documented numerically in the yellow box allocated to 35.1-35.9°C. Likewise 38.1°C should be documented numerically in the pink box allocated to ≥38°C.

- The accepted temperature parameters on the IMEWS are 36.0-37.4°C.

- A fall or rise in temperature or swinging pyrexia may indicate sepsis.

- Hypothermia is a significant finding that may indicate infection and should not be ignored.

- Pyrexia may be masked if antipyretics have been administered.

- If pyrexial, a sepsis screen and appropriate antibiotic therapy should be considered at an early stage. See section 2.1.3 for more detail.

Heart Rate

**Practical Guidance**

- The radial artery should be palpated using the index and middle finger, supporting the woman’s wrist across her chest, and the rate counted for 30 seconds and doubled if the rate is regular, or sixty seconds if irregular.

- Pulse oximeters also give a heart rate reading. However, if the woman has a bradycardia or tachycardia detected electronically, the pulse should be assessed manually for noting rate, rhythm and strength.

- The heart rate should be documented numerically on the IMEWS in the appropriate box i.e. heart rate of 86 bpm should be documented into the white box area allocated to 80-89 bpm. A heart rate of 102 bpm should be documented numerically in the yellow box allocated to 100-109 bpm.

- The accepted parameters for heart rate on IMEWS are 60-99bpm.

- Persistent tachycardia over 100bpm is an important sign that may indicate serious underlying disease and warrants investigation.

Blood Pressure

The following are responsible for implementation of **recommendation 3:**

**Doctors, Midwives and Nurses.**

**Recommendation 3**

The blood pressure (BP) should be measured with the correct cuff size. In women with a mid-arm circumference (MAC) > 33 cms, the use of a standard cuff may overestimate the BP and lead to unnecessary interventions. **Grade B**
Practical Guidance

Systolic and diastolic blood pressure, are recorded separately to facilitate the appropriate triggers to be assigned to two separate results from one recording.

Blood pressure must be measured using the correct cuff size, and the size of the cuff used should be documented in the woman’s notes.

It is recommended that the mid-arm circumference (MAC) should be measured in all pregnant women particularly those with BMI > 29.9kg/m at their first antenatal visit. If the MAC is > 33 cms, a large cuff should be used for BP measurements subsequently.

The mid-arm point is determined by measuring the length of the upper arm from the shoulder joint to the antecubital fossa. The mid arm point is taken as the point halfway between these two landmarks.

Systolic blood pressure should be documented at Korotkoff I or first clear sound, and the diastolic blood pressure at Korotkoff V, when sounds are no longer audible.

Electronic recording of blood pressure can underestimate readings. It is recommended good practice that if a blood pressure is raised with an electronic reading, the BP should be rechecked manually at least once using an aneroid sphygmomanometer.

Findings should be documented as a numerical value in the appropriate box i.e. systolic blood pressure of 156mmHg is written into the yellow box representing 150-159mmHg. The diastolic reading of 86mmHg should be documented numerically in the white box allocated to 80-89mmHg.

It is recommended that a dotted line between the systolic and diastolic numbers is used, to display a graphic trend.

The acceptable parameters for systolic blood pressure on the IMEWS are 100-139mmHg. The acceptable parameters for diastolic blood pressure on the IMEWS are 50-89mmHg (i.e. 100/50mmHg to 139/89mmHg). Hypotension is a late sign of deterioration as it signifies decompensation. The physiological changes caused by pregnancy and childbirth can mean that early signs of impending collapse are not easily recognised.

Hypertension: The conventional definition of hypertension in pregnancy is:

- Two readings of 140/90mmHg taken at least 4 hours apart, or
- An increase or 15mm/Hg above the booking blood pressure, or
- One reading of 160/100mmHg or greater.

Concerns regarding blood pressure readings should be discussed with the Obstetrician/AAnaesthetist as appropriate.
Urine

**Practical Guidance**
Urinalysis of freshly voided urine should be undertaken for the purpose of screening, diagnosis or assessment of management and documented on the IMEWS on the following occasions:
- On admission to the hospital for any reason as a baseline observation
- Specific maternal disorders or treatment, e.g. hypertensive disease, diabetes
- Clinical symptoms, e.g. dysuria.

The frequency of urinalysis following admission depends on the clinical assessment and diagnosis of the woman i.e.
- An antenatal woman admitted with hypertensive disease or urinary tract infection may require a minimum of daily urinalysis or more frequently if her clinical condition deteriorates
- However, an antenatal or postnatal woman without risk factors may not require daily urinalysis.

All urinalysis findings should be documented as they appear on the dipstick or urinalysis machine printout e.g., neg, trace, +, ++, ++++,++++.

**Box 1 Summary of urinalysis findings and associated potential diagnoses**

<table>
<thead>
<tr>
<th>Urinalysis Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proteinuria</strong> may indicate infection, underlying renal disease which may be as a result of hypertension or may be a contaminated specimen (from liquor or vaginal discharge). Transient positive tests are usually insignificant, due to the physiological changes in pregnancy resulting in the presence of small amounts of albumin and globulin in the urine. To exclude infection a midstream specimen (MSU) should be obtained, tested and sent for laboratory analysis.</td>
</tr>
<tr>
<td><strong>Glucose</strong> is common in pregnancy due to the physiological changes of pregnancy resulting in altered renal function. However, glucose also appears in the urine</td>
</tr>
<tr>
<td>o When blood glucose levels rise (hyperglycaemia).</td>
</tr>
<tr>
<td>o If renal absorption lowers.</td>
</tr>
<tr>
<td>o Transiently following the administration of corticosteroids e.g. Betamethasone / Dexamethasone.</td>
</tr>
<tr>
<td><strong>Others</strong>: (this list is not exhaustive)</td>
</tr>
<tr>
<td>o <strong>Ketones</strong>: Mild ketonuria is a normal physiological change in pregnancy, and provided it is mild, is insignificant. However ketonuria is also indicative of women who are fasting, vomiting or with uncontrolled diabetes mellitus. Some drugs may also give a positive result.</td>
</tr>
<tr>
<td>o <strong>Blood</strong>: Blood should not appear in the urine; its presence may be indicative of infection, trauma or calculi or may be due to contamination by blood from another part of the body, e.g. vaginal discharge or haemorrhoids. A positive result warrants further investigation.</td>
</tr>
<tr>
<td>o <strong>Nitrites</strong>: Nitrites in the urine are indicative of urinary tract infection and an MSU should be sent for laboratory analysis.</td>
</tr>
</tbody>
</table>
The following are responsible for implementation of recommendation 4: Doctors, Midwives and Nurses.

**Recommendation 4**
Any fall in the level of consciousness (AVPU scale) should always be considered significant and acted on immediately. **Grade C**

Assessment of Neurological Response - AVPU Scale

- A neurological response is a measure of consciousness and the best response of the following should be measured and documented on all women using the AVPU scale, indicating
  - **A** – Alert and orientated to person, place, time and event.
  - **V** – Responds to voice/verbal stimuli (e.g. post operative recovery).
  - **P** – Responds to painful stimuli with a purposeful or non-purposeful movement.
  - **U** – Unresponsive - The patient does not respond to any stimuli.
- The neurological response assessment should be documented in the appropriate box:
  - Alert (A): white box (accepted neurological response parameter)
  - Responds to Voice (V): Pink box
  - Responds to Pain (P): Pink box
  - Unresponsive (U): Pink box.
**Pain Score**

**Practical Guidance**
Women should be asked to score their pain on a scale of 0-10 (0: No pain, 10: extreme pain) when a full set of observations is recorded and the numerical value recorded on the IMEWS. The following tools may also be used:

![Pain Scale Diagram](image)

**Wong-Baker FACES® Pain Rating Scale**

![Wong-Baker Faces](image)

### Timing of observations for IMEWS

The following are responsible for implementation of recommendation 5:

**Doctors, Midwives and Nurses.**

<table>
<thead>
<tr>
<th>Recommendation 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The timing of clinical observations will depend on the woman’s individual clinical circumstances.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All women who present to or are admitted to a maternity unit should have a full set of vital signs recorded as a baseline on the IMEWS.</td>
</tr>
<tr>
<td>• The frequency that subsequent observations should be recorded is then determined by the results of the initial observations and the presenting clinical condition.</td>
</tr>
<tr>
<td>• All yellow and pink triggers should be added up and documented at the bottom of the IMEWS each time observations are recorded.</td>
</tr>
<tr>
<td>• If the woman scores any yellow or pink scores, the escalation process should be initiated.</td>
</tr>
<tr>
<td>• The IMEWS should be used for all pregnant women with a confirmed clinical pregnancy and up to 42 days postnatal who are admitted or transferred to a general hospital.</td>
</tr>
<tr>
<td>• The IMEWS should NOT be used for women in labour and women in high dependency, recovery and critical care settings. Vital signs for women in labour should be recorded on the partogram. The last set of vital signs for each of these areas should be documented on the IMEWS prior to transfer to the postnatal ward.</td>
</tr>
</tbody>
</table>
## Table 2 IMEWS frequency table

<table>
<thead>
<tr>
<th>Triggers</th>
<th>Minimum frequency of recording observations on IMEWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Yellow trigger</td>
<td>Repeat full set of observations on the IMEWS after 30 minutes and before 60 minutes.</td>
</tr>
<tr>
<td>2 Yellow triggers or 1 Pink trigger</td>
<td>Call the obstetrician to review. Repeat a full set of observations after 30 minutes.</td>
</tr>
<tr>
<td>&gt; 2 Yellow triggers or ≥2 Pinks triggers</td>
<td>Call the obstetrician and request immediate review. Repeat a full set of observations within 15 minutes or monitor continuously.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical situation</th>
<th>Minimum frequency of recording observations on IMEWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenatal low risk (in-patient) woman with an uncomplicated pregnancy</td>
<td>Full set of vital signs recorded on the IMEWS on admission. Thereafter as clinically required.</td>
</tr>
<tr>
<td>Postnatal low risk in-patient woman with an uncomplicated pregnancy and birth</td>
<td>Full set of observations following the birth of the baby as clinically required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antenatal or Postnatal</th>
<th>Minimum frequency of recording observations on IMEWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Hypertensive disorders of pregnancy</td>
<td>Full set of vital signs including urinalysis recorded daily. Thereafter BP recorded 4 hourly.</td>
</tr>
</tbody>
</table>
2.1.2 Clinical communication and escalation of care

The following are responsible for implementation of Recommendation 6:
Healthcare facility Senior Management Team (e.g. CEO, Director of Nursing/Midwifery, Clinical Director), Doctors, Midwives and Nurses.

**Recommendation 6**
The ISBAR communication tool should be used when communicating information in relation to deteriorating and/or critically ill patients. Where a situation is deemed to be critical, this must be clearly stated at the outset of the conversation. **Grade B**

**Practical Guidance**
All maternity units should have effective communication systems in place to ensure that there is minimal delay between the triggering of a call for a review and the arrival of a medical doctor. The designation of who should be “senior doctor” called should be agreed locally by the midwifery and medical senior management and should be clearly communicated to staff members. The designation may depend on the availability of staff resources.

Depending on the acute illness, early consideration should be given to seeking professional assistance from other medical specialties such as an anaesthetist, haematologist or microbiologist either from within or from outside the maternity unit. Once the patient is clinically stable, it may be necessary to transfer the patient to an Intensive Care Unit (ICU). If this is anticipated, early communications with the ICU is important. Follow local care pathway for ICU admission.

Attention should also be paid to staff handovers in all disciplines. This is particularly important at weekends and holidays when staffing levels may be lower than usual.

A structured communication system for patients may be helpful, such as the ISBAR system. Further information on the ISBAR is also available from the Training Manual for the NEWS3 and can be downloaded as a smart app for the iPhone, iPod Touch and iPad available from https://itunes.apple.com/us/app/isbar-hd/id465890794

Refer to:

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**Care pathway for the deteriorated critically ill pregnant woman**

| Detection of clinical deterioration, recognition of critical illness | RESPONSE: Multidisciplinary Care Plan |
| - Early Warning System | - Obstetrics |
| - Clinical evaluation | - Midwifery |
| | - Anaesthesia/ Critical Care |
| Components - ABCDE | ABC - airway breathing circulation, |
| | D - Delivery, E - Early transfer |
| Consultant-led decision making | Level 2 Care |
| | Location- Delivery Suite, Maternity Hospital |
| Level 3 Care | Location- ICU- Critical Care Service, General Hospital, mandatory transfer |
| | Requirement- Inter-hospital critical care transport/ retrieval |
| Level 2 Care | Requirement- Inter-hospital critical care transfer/ retrieval |
Table 3 ISBAR communication tool

<table>
<thead>
<tr>
<th>ISBAR Communication Tool SAMPLE</th>
<th>Patient Deterioration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify:</td>
<td>You</td>
</tr>
<tr>
<td>You</td>
<td>Recipient of handover information</td>
</tr>
<tr>
<td>Patient</td>
<td></td>
</tr>
<tr>
<td>Situation:</td>
<td>Why are you calling?</td>
</tr>
<tr>
<td>Why are you calling?</td>
<td>(Identify your concerns)</td>
</tr>
<tr>
<td>Background:</td>
<td>What is the relevant background?</td>
</tr>
<tr>
<td>Assessment:</td>
<td>What do you think is the problem?</td>
</tr>
<tr>
<td>Recommendation:</td>
<td>What do you want them to do?</td>
</tr>
</tbody>
</table>

Reproduced and adopted with permission from Dr S. Marshall, Monash University, Australia.

The following are responsible for implementation of **recommendation 7**: Healthcare facility Senior Management Team (e.g. CEO, Director of Nursing/Midwifery, Clinical Director) and Doctors, Midwives and Nurses.

**Recommendation 7**
The designation of the senior doctor to be called should be agreed locally by the midwifery and medical senior management. **Grade D**

The following are responsible for implementation of **recommendation 8**: Doctors, Midwives and Nurses.

**Recommendation 8**
Depending on the acute illness, early consideration should be given to seeking professional assistance from other medical specialties either within or from outside the maternity unit. **Grade D**

The IMEWS escalation chart as shown in practical guidance section gives guidance on when to seek professional assistance. For the most up-to-date version of the IMEWS chart see: [http://www.hse.ie/eng/about/who/clinical/natclinprog/obsandgynaeprogramme/imews](http://www.hse.ie/eng/about/who/clinical/natclinprog/obsandgynaeprogramme/imews) and [http://www.health.gov.ie/patient-safety/ncec](http://www.health.gov.ie/patient-safety/ncec)
2.1.3 Suspected maternal sepsis

Table 4 Classification of infections in pregnancy

<table>
<thead>
<tr>
<th>A. Infections specific to pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chorioamnionitis</td>
</tr>
<tr>
<td>2. Endometritis (with or without retained products)</td>
</tr>
<tr>
<td>3. Wound infection post caesarean section</td>
</tr>
<tr>
<td>4. Perineal infection</td>
</tr>
<tr>
<td>5. Lactational mastitis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Infections exacerbated during pregnancy, for example,</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Urinary tract infection including pyelonephritis</td>
</tr>
<tr>
<td>2. Pneumonia</td>
</tr>
<tr>
<td>3. Rubella</td>
</tr>
<tr>
<td>4. Listeria</td>
</tr>
<tr>
<td>5. Influenza</td>
</tr>
<tr>
<td>6. Varicella</td>
</tr>
<tr>
<td>7. Toxoplasmosis</td>
</tr>
<tr>
<td>8. Herpes infection</td>
</tr>
<tr>
<td>9. Parvovirus</td>
</tr>
<tr>
<td>10. Cytomegalovirus (CMV)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Infections incidental to pregnancy, for example,</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Viral hepatitis</td>
</tr>
<tr>
<td>2. Human Immunodeficiency Virus (HIV)</td>
</tr>
<tr>
<td>3. Sexually Transmitted Diseases (STDs)</td>
</tr>
<tr>
<td>4. Tuberculosis</td>
</tr>
<tr>
<td>5. Endocarditis</td>
</tr>
</tbody>
</table>

Source: Turner 2014
The following are responsible for implementation of **recommendation 9:**
Doctors, Midwives and Nurses.

### Recommendation 9
The Sepsis 6 Box customised for pregnancy should be utilised for consideration of maternal sepsis.
**Grade C**

**Practical Guidance**
The escalation guide outlines the Systemic Inflammatory Response Syndrome (SIRS) criteria that are indicative of sepsis. If two or more SIRS criteria are present and infection is suspected after a medical review, the sepsis 6 needs to be completed within 1 hour.

**Systemic Inflammatory Response Syndrome (SIRS)** is the presence of 2 or more SIRS criteria

**Infection** is defined as a pathological process caused by invasion of normally sterile tissue or fluid or body cavity by pathogenic or potentially pathogenic micro-organisms. It is important to point out that, frequently, infection is strongly suspected without being microbiologically confirmed.

**Sepsis** Sepsis is the clinical syndrome defined by the presence of both infection and a systemic inflammatory response syndrome (SIRS). However, since infection cannot be always microbiologically confirmed, the diagnostic criteria are infection, suspected or confirmed and the presence of 2 or more SIRS criteria.

**Severe sepsis** refers to sepsis complicated by organ dysfunction. In the 8th Edition of the ICD-10-AM/ACHI/ACS, this is extended to include organ failure. This difference does not affect the National Clinical Guideline (Sepsis Management) diagnostic criteria which identify a minimum level of organ dysfunction beyond which severe sepsis is diagnosed.

**Septic shock** is defined as severe sepsis with circulatory shock with signs of organ dysfunction or hypoperfusion in the 8th Edition of the ICD-10-AM/ACHI/ACS.

Pregnancy poses additional challenges in the prevention and management of sepsis. As part of the normal physiological response in pregnancy, a woman’s white cell counts may increase. The immune response to infection is modulated and the pharmacokinetics of antibiotics are different compared with the non-pregnant adult. Thus, it has been necessary to develop an Irish Maternity Early Warning System (IMEWS) with customised SIRS criteria, see Appendix 2.

The customised maternal Sepsis 6 takes into consideration the possibility of additional sites of infection that may need to be considered in maternity patients and when giving an IV fluid bolus, caution needs to be exercised in the presence of pre-eclampsia.

Special considerations with regard to escalation of care in response to Systemic Inflammatory Response Syndrome (SIRS) criteria is required to take into account the physiological changes of pregnancy on the women.

Guidance for pregnancy-specific infections including antibiotic regimens tailored for pregnancy is being developed and will be published by the Institute of Obstetrics and Gynaecology, Royal College of Physicians and HSE Clinical Programme in Obstetrics and Gynaecology.

*The customised SIRS criteria and further detail on sepsis management is available in National Clinical Guideline No. 6 Sepsis Management available at [www.health.gov.ie/patient-safety/ncsec](http://www.health.gov.ie/patient-safety/ncsec)*

---

2.1.4 Implementation of IMEWS

**Organisational supports and governance structures**
The following are responsible for implementation of recommendations 10-12: Healthcare facility Senior Management Team (e.g. CEO, Director of Nursing/Midwifery, Clinical Director and Director of Finance) and Doctors, Midwives and Nurses.

**Recommendation 10**
A formal governance process (such as an IMEWS group/committee) should oversee the development, implementation and ongoing review of IMEWS recognition and response systems locally.

**Practical Guidance**
An IMEWS group/committee should:
- Have appropriate responsibilities delegated to it and be accountable for its decisions and actions.
- Monitor the effectiveness of interventions and education.
- Have a role in reviewing performance data, and audits.
- Provide advice about the allocation of resources.

**Recommendation 11**
Any new recognition and response systems or procedures should be integrated into existing organisational safety and quality systems to support their sustainability and offer opportunities for organisational learning.

**Recommendation 12**
Organisations should have systems in place to ensure that the resources required to provide emergency assistance (such as equipment and pharmaceuticals) are always operational and available.
Education
The following are responsible for the implementation of recommendation 13: Healthcare facility Senior Management Team (e.g. CEO, Director of Nursing/Midwifery, Clinical Director and Director of Finance) and Doctors, Midwives and Nurses.

Recommendation 13
All clinical staff should receive education and training in IMEWS and the local escalation protocol relevant to their position. They should know how to call for emergency assistance if they have any concerns about a patient, and know that they should call under these circumstances. This information should be provided at the commencement of employment and as part of regular refresher education and training.

Practical Guidance
A ‘train the trainer’ model is to be adopted for implementation of the IMEWS education programme, that is, suitable staff, doctors, midwives, nurses and physiotherapists train as trainers and deliver the multi-disciplinary programme to staff. Delivering an education session is estimated to take 2 hours. On average, the education sessions will include 10 trainees (2 trainers). The number of trainers required is estimated as 2 trainers per maternity unit (total of 38 trainers) however the distribution of trainer per trainee may vary depending on trainee number at each maternity unit location.

All medical, midwifery and nursing staff should be able to:
- Systematically assess a patient
- Understand and interpret abnormal physiological parameters and other abnormal observations
- Understand and operationalise IMEWS and IMEWS process for escalation of care
- Initiate appropriate early interventions for patients who are deteriorating
- Respond with life-sustaining measures in the event of severe or rapid deterioration pending the arrival of emergency assistance
- Communicate information about clinical deterioration in a structured and effective way to the primary medical practitioner or team, to clinicians providing emergency assistance and to patients, families and carers
- Undertake tasks required to properly care for patients who are deteriorating such as developing a clinical management plan, writing plans and actions in the healthcare record and organising appropriate follow up.

Evaluation and audit
The following are responsible for implementation of recommendation 14: Relevant HSE Corporate Directorates and Divisions, Healthcare facility Senior Management Team (e.g. CEO, Director of Nursing/Midwifery, Clinical Director and Director of Finance) and Doctors, Midwives and Nurses in consultation with the IMEWS multi-disciplinary group/committee once established (Recommendation 10).

Recommendation 14
Audit data should be collected and reviewed locally and pooled nationally regarding the implementation and effectiveness of IMEWS.

The following are responsible for implementation of recommendations 15-16. HSE National Clinical Programme for Obstetrics and Gynaecology and Quality and Patient Safety Division.

Recommendation 15
A key performance indicator for the implementation of IMEWS and its associated education programme is included in the HSE Service Plan.

Recommendation 16
The IMEWS parameters are reviewed annually and updated as new information becomes available either from national or international audits or research.
3 National Clinical Guideline development process

3.1 Aim of National Clinical Guideline
The purpose of this guideline is to improve the management of the in-patient care of a woman with a confirmed clinical pregnancy and up to 42 days in the postnatal period through the use of a standard maternity early warning system.

3.2 Methodology and literature review
To assist in rigour of development of this National Clinical Guideline, a systematic review of both clinical and economic literature was performed by a multidisciplinary group from National University of Ireland, Galway led by Professor Declan Devane. This review compiled the totality of clinical and economic evidence on early warning systems for use in maternity care. The literature which informed each recommendation is outlined in the rationale for the recommendation. The review adhered to the Preferred Reporting in Systematic Reviews and Meta-Analysis (PRISMA) criteria. The complete methodology is described in the full version National Clinical Guideline, appendix 6.

3.3 Budget impact findings
The budget impact analysis supports the National Clinical Guideline recommendations. The complete budget impact is described in the full version National Clinical Guideline, appendix 8.

3.4 External review
The guideline was peer reviewed by Ms. Margurite Hogan (Therapy Professionals), Ms. Eithne Coen (NMPDU, South East), Ms. Mary O’Reilly (Rotunda Hospital) and the Programme’s Clinical Advisory Group. Sepsis considerations were added to the guideline in July 2014. The guideline was reviewed and endorsed by the Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland and Clinical Strategy and Programmes Division, Health Service Executive in July 2014.

IMEWS resources for service users were developed in partnership with service users and the HSE Patient Advocacy Unit.

International Peer Review
The National Clinical Guideline was kindly reviewed by Dr. Melissa Bauer D.O., Director of Obstetric Anesthesiology Research, University of Michigan Health System and Professor Debra Bick, Florence Nightingale Faculty of Nursing and Midwifery, King’s College London

3.5 Procedure for update of National Clinical Guideline
It was agreed by the Guideline Development Group that it will review the National Clinical Guideline IMEWS publication on a three-yearly basis and update as appropriate. Therefore, this guideline will be reviewed again in 2017 by the Clinical Care Programme in Obstetrics and Gynaecology.

3.6 Implementation of National Clinical Guideline
The potential barriers and enablers for implementation are not an exhaustive list, and each obstetric and gynaecology service must identify site-specific issues and manage these appropriately.
3.7 Roles and responsibilities

This guideline should be reviewed by the healthcare facilities senior management teams in conjunction with the relevant specialists to plan implementation of the recommendations. This will enable the facility to ensure that the management of the hospital in-patient care of a woman with a confirmed clinical pregnancy and up to 42 days is at an optimal level irrespective of age, location or reason for admission.

3.8 Audit criteria

Measuring outcomes are particularly important to demonstrate the effectiveness or otherwise of the intervention for patients. These include:

- Number of times IMEWS is triggered annually.
- Basic patient outcome measures (e.g. hospital length of stay (HLOS), transfer to HDU, ICU, ICU length of stay, unexpected death.
- Number of cases of serious adverse clinical outcomes when the IMEWS was not triggered.
- Clinical outcomes of adverse outcomes when IMEWS was triggered.
- Identification of the location to which the patient has been transferred or otherwise, for those triggering a response.

The audit results and reports should be discussed at the IMEWS group/committee initially, and thereafter linking into appropriate hospital forums as required. The clinical audit cycle as part of the continuous quality improvement process should inform the audit plan.
Appendix 1: Guideline Development Group

IMEWS Design Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Prof. Michael Turner</td>
<td>Lead for Obstetrics and Gynaecology Clinical Programme, Clinical Strategy and Programmes Division</td>
</tr>
<tr>
<td>2 Ms Mary Doyle</td>
<td>Midwifery Practice Development Coordinator, Regional Maternity Hospital, Ennis Road, Limerick</td>
</tr>
<tr>
<td>3 Ms Triona Cowman</td>
<td>Director of the Centre for Midwifery Education, Located at the Coombe Women &amp; Infants University Hospital, Cork Street, Dublin 8</td>
</tr>
<tr>
<td>4 Ms Sheila Sugrue</td>
<td>National Lead Midwife, Office of Nursing &amp; Midwifery Services. Clinical Strategy and Programmes Division HSE.</td>
</tr>
<tr>
<td>5 Ms Eilish Croke</td>
<td>Programme Manager National Acute Medicine Programme. Clinical Strategy and Programmes Division HSE.</td>
</tr>
<tr>
<td>6 Dr Paula Connolly</td>
<td>Consultant Anaesthetist Our Lady of Lourdes Hospital Drogheda, HSE Dublin North East.</td>
</tr>
<tr>
<td>7 Ms Una Carr</td>
<td>Assistant Director of Midwifery, Galway University Maternity Hospital, Galway.</td>
</tr>
<tr>
<td>8 Ms Anna Deasy O Connor</td>
<td>Clinical Tutor (Midwifery), Trinity College Dublin.</td>
</tr>
<tr>
<td>9 Ms Marie Horgan</td>
<td>Clinical Nurse Specialist Chest Pain, St Luke’s Hospital, Kilkenny (representing the NEWS team).</td>
</tr>
<tr>
<td>10 Mr Mikey O Brien</td>
<td>Clinical Midwife Manager, Rotunda Maternity Hospital, Dublin.</td>
</tr>
<tr>
<td>11 Ms Ina Crowley (chairperson)</td>
<td>Assistant Director of Nursing and Midwifery (Prescribing), Dublin/Mid Leinster.</td>
</tr>
</tbody>
</table>

IMEWS Reference Team

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</tr>
<tr>
<td>5 Ms Geraldine Keohane</td>
<td>Director of Midwifery, Cork University Maternity Hospital, Cork.</td>
</tr>
<tr>
<td>6 Ms Patricia Hughes</td>
<td>Director of Midwifery, Coombe Women &amp; Infants University Hospital, Cork Street, Dublin 8.</td>
</tr>
<tr>
<td>7 Dr Ailish Quinlan</td>
<td>Clinical Indemnity Scheme, State Claims Agency Treasury Building, Grand Canal Street, Dublin 2.</td>
</tr>
<tr>
<td>8 Ms Mary Wynne</td>
<td>Acting Area Director Nursing and Midwifery Planning and Development, Dublin North East.</td>
</tr>
<tr>
<td>9 Mr Brian Lee</td>
<td>Programme Manager, National Obstetrics and Gynaecology Clinical Programme.</td>
</tr>
<tr>
<td>10 Ms Ina Crowley</td>
<td>Assistant Director of Nursing and Midwifery (Prescribing), Dublin/Mid Leinster.</td>
</tr>
</tbody>
</table>
Appendix 2: IMEWS chart sample (front and back cover)

For the most up-to-date version of the IMEWS chart see:
http://www.hse.ie/eng/about/who/clinical/natclinprog/obsandgynaeprogramme/imews

---

**Irish Maternity Early Warning System (IMEWS)**

**Escalation Guideline**

**Version 1.2**

---

**ALL IMEWS TRIGGERS**
Consider context and complete full clinical assessment. Implement measures to reduce triggers if appropriate. Complete a full set of observations on IMEWS immediately. Inform the Midwife in charge.

---

**1 YELLOW**
Repeat full set of observations on IMEWS after 30 and before 60 minutes.

---

**2 YELLOWS OR 1 PINK**
Call the obstetrician to review. Repeat a full set of observations after 30 minutes.

---

**>2 YELLOWS OR ≥2 PINKS**
Call the obstetrician and request immediate review. Repeat a full set of observations within 15 minutes or monitor continuously.

---

**ALL IMEWS TRIGGERS**
Liaise with the Midwife in charge Document all communication including:
- Redefined plan of care
- Ongoing frequency of observations

---

**CONSIDER MATERNAL SEPSIS**
Are 2 or more of the following SIRS criteria present?
- Temperature ≥38°C or <36°C
- Respiratory rate ≥20 breaths per min
- Heart rate ≥100 beats per min
- White cell count >16.9 or <4.0 x 10^9/L
- Bedside glucose >7.7 mmol/L (in the absence of diabetes)
- Acutely altered mental status

AND
If infection is suspected after medical review

Intervention: within one hour COMPLETE SEPSIS 6

**TAKE 3**
1. Appropriate cultures*
2. FBC +/- lactate
3. Start urine output chart
4. Maintain O₂ (94-98%)
5. Consider IV fluid bolus**
6. IV antibiotics

**GIVE 3**
- "e.g. blood, wound, vaginal swab, urine etc"
- **exercise caution in presence of pre-eclampsia**

---

*Hospital Name: .................................................. Ward: ...........................................................

**Addressograph**

---

**IMPORTANT:**
1. If concerned about a woman, escalate care regardless of triggers.
2. If action is not carried out as above, CMM/Midwife in charge must contact the senior obstetrician on duty.
3. Document all communication and management plans in notes.
The Irish Maternity Early Warning System

IMEWS Triggers Key

<table>
<thead>
<tr>
<th>IMEWS Trigger</th>
<th>Normal Values</th>
<th>Yellow Zone</th>
<th>Pink Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory rate (bpm)</td>
<td>11-19</td>
<td>≤10 or ≥25</td>
<td></td>
</tr>
<tr>
<td>SpO2 (%)</td>
<td>≥96-100</td>
<td>≤95</td>
<td></td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>36.0-37.4</td>
<td>37.5-37.9 or 38.0-38.9</td>
<td></td>
</tr>
<tr>
<td>Maternal HR (bPM)</td>
<td>60-79</td>
<td>≤50 or ≥120</td>
<td></td>
</tr>
<tr>
<td>Systolic BP (mmHg)</td>
<td>100-139</td>
<td>≤90 or ≥160</td>
<td></td>
</tr>
<tr>
<td>Diastolic BP (mmHg)</td>
<td>50-89</td>
<td>≤40 or ≥100</td>
<td></td>
</tr>
<tr>
<td>AVPU Alert</td>
<td>-</td>
<td>Voice, Pain or Unresponsive</td>
<td></td>
</tr>
</tbody>
</table>

Contact appropriate doctor for early intervention if the woman triggers one PINK or two YELLOW zones at any one time.

Pain Score 0-10

<table>
<thead>
<tr>
<th>Pain Score</th>
<th>Alert (A)</th>
<th>Voice (V)</th>
<th>Pain (P)</th>
<th>Unresponsive (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>V</td>
<td>P</td>
<td>U</td>
</tr>
</tbody>
</table>

Total Yellow Zones

Total Pink Zones

Initials
Appenix 3: Antenatal observation record (sample)

<table>
<thead>
<tr>
<th>Agreed E.D.D</th>
<th>Anti D Administered</th>
<th>No</th>
<th>Yes</th>
<th>Weight</th>
<th>kgs</th>
<th>B.M.I.</th>
<th>kg/m</th>
</tr>
</thead>
</table>

Date

Time (24hr Clock)

Gestation

Legible ID Band

Vital Signs to be recorded on IMEWS Chart

Abdominal Examination:

Inspection

Palpation
  - Fundal Height
  - Lie
  - Presentation
  - Position
  - Fifths palpable
    - Engaged / Not

Auscultation of Fetal Heart Rate

Fetal Wellbeing:

If SROM Please Record

Date _____________

Time_____________ hrs

Fetal Movement

Membranes /
Liquor/P.V.Loss

CTG Recorded (√)
(if applicable)

Maternal Wellbeing:

Emotional State

Sleep / Rest

Eating & Drinking

Intake Output chart
(required (Yes / No)

Bowels

Oedema

Signature,
PRINTED NAME, &
Role

Investigations Performed (Please date and initial when investigations are performed)

Ultrasound Scan/
Dopplers

FBC/Kleihauer

U&E

LFTs

Coag

Group & Antibodies

Blood Cultures

MSU

24 Hour Urine

Total Protein

HVS/LVS

Other:
### Antenatal observational chart (reverse side)

Any concerns / deviations from the norm should be reported to the appropriate Midwife / Obstetrician.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreed EDD</td>
<td>Refer to agreed EDD (confirmed with early dating ultrasound scan)</td>
</tr>
<tr>
<td>Weight / BMI</td>
<td>All women should have their weight, height and BMI calculated and documented at booking. Women with a BMI &gt; 29.9 kg/m² should commence a pregnancy/obesity care pathway / action plan.</td>
</tr>
</tbody>
</table>

#### Vital Signs on IMEWS

All physiological observations must be recorded on the Irish Maternity Early Warning System.

#### Abdominal Examination

**Inspection**
- NAD, size, shape, scars, striae

**Fundal Height**
- Equal to dates, height measured in cms, small for dates/gestational age, large for dates/gestational age

**Lie**
- Longitudinal, transverse, oblique, unstable

**Presentation**
- Cephalic, breech, shoulder

**Position**
- OA, LOA, ROA, LOT, ROT, OP, LOP, ROP

**Fifths palpable Engaged /Not**
- Engaged, 1/5, 2/5, 3/5, 4/5, 5/5, ballotable, free

#### Auscultate:

**Fetal Heart Rate**
- Average rate measured in beats per minute with Pinard Stethoscope/ Doppler/ CTG.

#### Fetal Wellbeing:

**Fetal Movement**
- Normal pattern, increased activity, reduced fetal movements, absence of fetal movements

**Membranes / Liquor/P.V.Loss**
- Membranes intact, ruptured, suspected ruptured membranes.
- Liquor/PV Loss: **Colour**: clear, pink, blood stained, meconium, **Volume**: small / large amount, **Odour**: no odour, foul smelling

**CTG Recorded (Yes / No) (if applicable)**
- If applicable record CTG and comment on the features / findings in the woman’s notes.

#### Maternal Wellbeing:

**Emotional State**
- Coping well, anxiety, tearful, low mood.

**Eating & Drinking**
- Normal intake, fasting, restricted fluid intake, reduced appetite, special diet, nausea, vomiting.

**Intake/Output Chart required (Yes/No)**
- (Yes / No) if Intake/Output chart or Fluid Balance chart required.

**Bowels**
- B.O (bowels opened), BNO (bowels not opened), constipation, diarrhoea, leakage, urgency, haemorrhoids

**Sleep / Rest**
- Sleeping/resting well, insomnia, fatigue.

**Oedema**
- NAD, Facial generalised leg, ankle. (Comment x 2 or indicate (L) Left & (R) Right) Mild, moderate, severe.

#### Investigations Performed:
- Document if any investigations are performed by inserting date and initials in the appropriate box.
# Appendix 4: Postnatal observation record: mother (sample)

## Orientation to Ward
*(carried out by the Midwife accepting the transfer to the postnatal ward)*

<table>
<thead>
<tr>
<th>Introduction to Midwife</th>
<th>Yes</th>
<th>No</th>
<th>Visiting arrangements explained</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Ward Layout</td>
<td>Yes</td>
<td>No</td>
<td>Meal times explained</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Information on Baby Security</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Discussion re expected date of discharge**

- Yes
- No

**Expected date of discharge**

___/___/___

**Signature**

__________________

---

**Special Requirements:**

<table>
<thead>
<tr>
<th>Anti D Required</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes: <em><strong>/</strong></em>/___ date administered</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MMR Required**

- Yes
- No

**If yes: ___/___/___ date administered**

**Signature**

__________________

---

**Postnatal Day**

<table>
<thead>
<tr>
<th>Admission</th>
<th>Day</th>
<th>Day</th>
<th>Day</th>
<th>Day</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Date</th>
</tr>
</thead>
</table>

**Time (24hr clock)**

<table>
<thead>
<tr>
<th>Legible I.D Band (Yes / No)</th>
</tr>
</thead>
</table>

**Vital Signs to be recorded on IMEWS Chart**

<table>
<thead>
<tr>
<th>Wellbeing/mood</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Sleep</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Breasts</th>
</tr>
</thead>
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<table>
<thead>
<tr>
<th>Nipples</th>
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</table>

<table>
<thead>
<tr>
<th>Breastfeeding</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Uterus</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Wound</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Perineum</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>P.V Loss/Lochia</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Micturition</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Bowels</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Legs</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Postnatal Exercise</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Bonding</th>
</tr>
</thead>
</table>

**Signature, Printed Name & Job Title**

---

**Postnatal Education:**

- Yes
- No

*(See reverse for list of same to be completed)*

*(If all complete) Signature__________________ Date______________*
### Suggested postnatal observations (reverse side)

(This list is not exhaustive and is only intended for useful reference)

Any concerns / deviations from the norm should be reported to the appropriate Midwife / Obstetrician.

<table>
<thead>
<tr>
<th>Vital Signs:</th>
<th>All physiological observations must be recorded on the IMEWS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wellbeing / Mood:</td>
<td>Coping well, baby blues, excessive anxiety, postnatal depression.</td>
</tr>
<tr>
<td>Sleep:</td>
<td>Good, intermittent, little, none, excessive sleep, inability to get sleep, premature waking</td>
</tr>
<tr>
<td>Breasts:</td>
<td>Indicate (L) Left &amp; (R) Right or Comment x 2: Soft, filling, full, engorged, sore</td>
</tr>
<tr>
<td>Nipples:</td>
<td>Indicate (L) Left &amp; (R) Right or Comment x 2: NAD, cracked, bleeding, bruised, healing, sore,</td>
</tr>
<tr>
<td>Breastfeeding:</td>
<td>Confidence with positioning, attachment, support required, expressing, any problems?</td>
</tr>
<tr>
<td>Uterus:</td>
<td>W/C (well contracted), abdominal tenderness, involuting, sub-involution, boggy, high</td>
</tr>
<tr>
<td>Wound:</td>
<td>Clean and dry, healing, moist, inflamed, infected, suture / clip removal.</td>
</tr>
<tr>
<td>Perineum:</td>
<td>Soreness, bruising, swelling, sutures, infection</td>
</tr>
<tr>
<td>P.V.Loss/Lochia:</td>
<td>Type (rubra, serosa, alba), amount (minimal, average, heavy), colour (red, brown, pink), offensive odour, presence of clots</td>
</tr>
<tr>
<td>Micturition:</td>
<td>Pain on passing urine, leakage, stress incontinence, urgency. Time and volume (mls) of first 2 voids to be documented. If either of first 2 voids is less than 200mls, consult Bladder Care Guideline</td>
</tr>
<tr>
<td>Bowels:</td>
<td>B.O (bowels opened), BNO (bowels not opened), constipation, diarrhoea, leakage, urgency, haemorrhoids</td>
</tr>
<tr>
<td>Legs:</td>
<td>Comment x 2 or indicate (L) Left &amp; (R) Right. NAD, oedema, redness, swelling, pain, varicose veins, thrombophlebitis, cramps, deep vein thrombosis</td>
</tr>
<tr>
<td>Postnatal Exercises:</td>
<td>Explained and encouraged (Ex/ENC), doing them, not doing them</td>
</tr>
<tr>
<td>Bonding:</td>
<td>Good, reassured, mother expressing difficulty</td>
</tr>
</tbody>
</table>

### Postnatal Education

(Please provide this education from the time of admission and clearly document same below)

<table>
<thead>
<tr>
<th>Information Given and Discussed with Mother</th>
<th>Date</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rest/Hygiene/Nutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postnatal “Blues” / Depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding Support/Information</td>
<td></td>
<td></td>
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<tr>
<td>Cervical Smear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccination/ Immunisation/BCG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Instruction on the safe use of formula (if required)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changing / Top and tail/ Handling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cord Care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye Care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevention of SIDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signs of effective feeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plagiocephaly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin D Supplementation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 5: Patient information leaflet

This leaflet was produced as a recommendation of a patient working group on ways to promote improved safety in patient care and to empower patients to take greater control over their health and well-being whilst in hospitals in Ireland.

Get involved!

Find out about how you can get involved in improving health services in Ireland.

The HSE is actively inviting service users to get involved on patient forums and quality improvement initiatives. To find out more contact:

National Advocacy Unit, HSE,
Quality & Patient Safety Directorate,
Health Service Executive, Oak House,
Millennium Park, Naas, Co. Kildare

Tel: (045) 880 400
Email: yoursay@hse.ie
www.hse.ie

This leaflet was produced as a recommendation of a patient working group on ways to promote improved safety in patient care and to empower patients to take greater control over their health and well-being whilst in hospitals in Ireland.
To ensure that any change in your condition is picked up early, maternity hospitals in Ireland have an early warning system in place called IMEWS. This system is used along with clinical assessment to detect any change in your condition and to improve the decision making about the care that you might need if you are ill during your pregnancy.

**Pregnancy is a normal healthy event**
Most healthy women have a normal pregnancy and birth and do not suffer any illness as a result of pregnancy. However, for a minority of women this is not the case. To ensure that any change in a woman’s condition is picked up early, maternity hospitals in Ireland have a system in place called the Irish Maternity Early Warning System (IMEWS).

**Get involved!**
The responsibility for patient safety remains with your healthcare team. However, you also play a vital role in the decision making about your care. We encourage you to ask questions and become fully informed and involved in the decision making about your care. **Remember - it’s safer to ask.**

**Your vital signs**
The maternity team assess your vital signs while you are in hospital. Vital signs are signs that are essential for life, for example breathing and heart rate.

**The maternity team:**
- Assess your breathing, your heart rate and your level of consciousness
- Take your blood pressure and temperature
- Assess the level of oxygen in your blood.

All of these measurements are recorded in your observation chart for ongoing monitoring.

**What is IMEWS?**
IMEWS is a system for the early detection of illness during pregnancy and after a woman has had a baby. This system is in place across all maternity hospitals in Ireland. Due to the changes which take place in a woman’s body during pregnancy and after the baby is born, it is often difficult to detect a severe illness. IMEWS helps to detect earlier if a woman has developed a severe illness and it helps provide safe, high quality care in a timely manner for all women using our maternity services.

IMEWS helps maternity teams to make decisions in relation to the care that women might need if they are ill during pregnancy.

It also alerts the maternity team to:
- Carry out a full review of your condition
- Carry out tests or investigations
- Make a plan for ongoing care
- Make the right decision in relation to the type of care that is needed.

**Let your midwife know, if you are feeling unwell**
The midwifery/nursing staff will inform the doctor requesting that they intervene early to prevent your condition from getting worse.
Appendix 6: Glossary of terms and abbreviations

Definitions within the context of this document

Clinician
A healthcare professional such as a doctor, midwife or nurse involved in clinical practice.

Early Warning Score (EWS)
An early warning score is a bedside track and trigger system which midwifery/nursing staff calculate from the vital signs recorded, and aims to indicate early signs of a patient's deterioration.

Healthcare staff
Includes medical doctors, midwives, nurses, healthcare assistants, biomedical scientists, pharmacists, allied health and social care professionals and healthcare management.

IMEWS Irish Maternity Early Warning System
IMEWS is a nationally agreed scoring system developed for early detection of life threatening illness in hospital in-patient care in obstetric and gynaecological services of a woman with a confirmed clinical pregnancy and up to 42 days in the postnatal period.

ISBAR
ISBAR is a communication tool, and the acronym stands for Identify, Situation, Background, Assessment, and Recommendation. This technique is used for prompt and appropriate communication within healthcare organisations.

Full set of Vital Signs
Where a full set of vital signs is indicated, this includes recording respiratory rate, temperature, maternal heart rate, blood pressure, neurological response and pain score.

Urinalysis is required on admission. Thereafter, the frequency of urinalysis following admission depends on the clinical assessment, diagnosis and care plan for the woman.
Abbreviations

AVPU: Alert, Voice, Pain, Unresponsive
BPM: Beats per minute
BP: Blood Pressure
CI: Confidence Interval
DoH: Department of Health
EWS: Early Warning Score
GDG: Guideline Development Group
GP: General practitioner
HIQA: Health Information and Quality Authority
HIPE: Hospital In-Patient Enquiry
HLOS: Hospital Length of Stay
HSE: Health Services Executive
ICU: Intensive care unit
IMEWS: Irish Maternity Early Warning System
ISBAR: Identify Situation - Background – Assessment - Recommendation
ITU: Intensive therapy unit
LOS: Length of stay
MAC: Mid-arm circumference
MEOWS: Modified Early Obstetric Warning System
N/A: Not applicable
NEWS: National Early Warning Score
NICE: National Institute for Health and Clinical Excellence
NHS: National Health Service
NPV: Negative Predictive Value
NUIG: National University of Ireland Galway
OR: Odds Ratio
PPV: Positive predictive value
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RCT: Randomised controlled trial
SD: Standard deviation
SPHM: Specialist in Public Health Medicine
US: United States
UK: United Kingdom
WHO: World Health Organisation