# SOP for pregnant patients presenting for emergency non-obstetric surgery in Swansea Bay UHB


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# Contents

## 1. Key Stakeholders

- Mr Rami Radwan: Consultant Colorectal Surgeon
- Dr Rachel Scale: Consultant Anaesthetist
- Dr Nick Cooper: Anaesthetic Trainee
- Miss Najiya Ali: Consultant Obstetrician
- Laura Rose: Midwifery Intrapartum Lead
- Dr Joanna Webb: Consultant Neonatologist
- Dr Ankita Jain: Consultant Paediatrician & Neonatal Liaison in Morriston
- Sarah James: Matron for Acute Paediatric Services
- Nia Evans: Clinical Pharmacist, Morriston
- Dr Linda Middleton: Adult Critical Care Consultant
- Dr Simon Ford: Consultant Anaesthetist
- Dr Catrin Dyer, ED Consultant

## 2. Relevant Contacts

*Morriston*

Surgical SPR On-call: 23383
General Surgical Consultant on call via Switchboard

Duty CEPOD Anaesthetist: 23808

General Paediatric Consultant on-call: 23242 or 23243 (09:00 – 17:00), via Switchboard OOH
General Paediatric SPR on-call: 23519 (09:00 – 17:00), 23518 (out-of-hours)
Paediatric Ward Nurse in Charge: 23585
Matron for Acute Paediatric services: 33888 or 07971990095

*Singleton*

Resident Surgical Officer: 25588

Resident Labour Ward Obstetric Consultant: 25510
Labour Ward Obstetric SPR: 25356
Labour ward Co-ordinator (Band 7 Midwife): 25675
Neonatal Consultant On-Call: 25344
Neonatal SPR On-call: 25432

Duty Consultant Anaesthetist: 25859 (8am-5pm), via Switchboard OOH
Second-on call Anaesthetist for Singleton: 25854

*Neath Port Talbot*

Midwifery Team Leader (Band 7): 01639 862103

*Transfer Services*

Adult WAST/ACTS: 03001 232301
Neonatal CHANTS: http://www.walesneonatalnetwork.wales.nhs.uk/neonatal-tranfer-service

## 3. Background

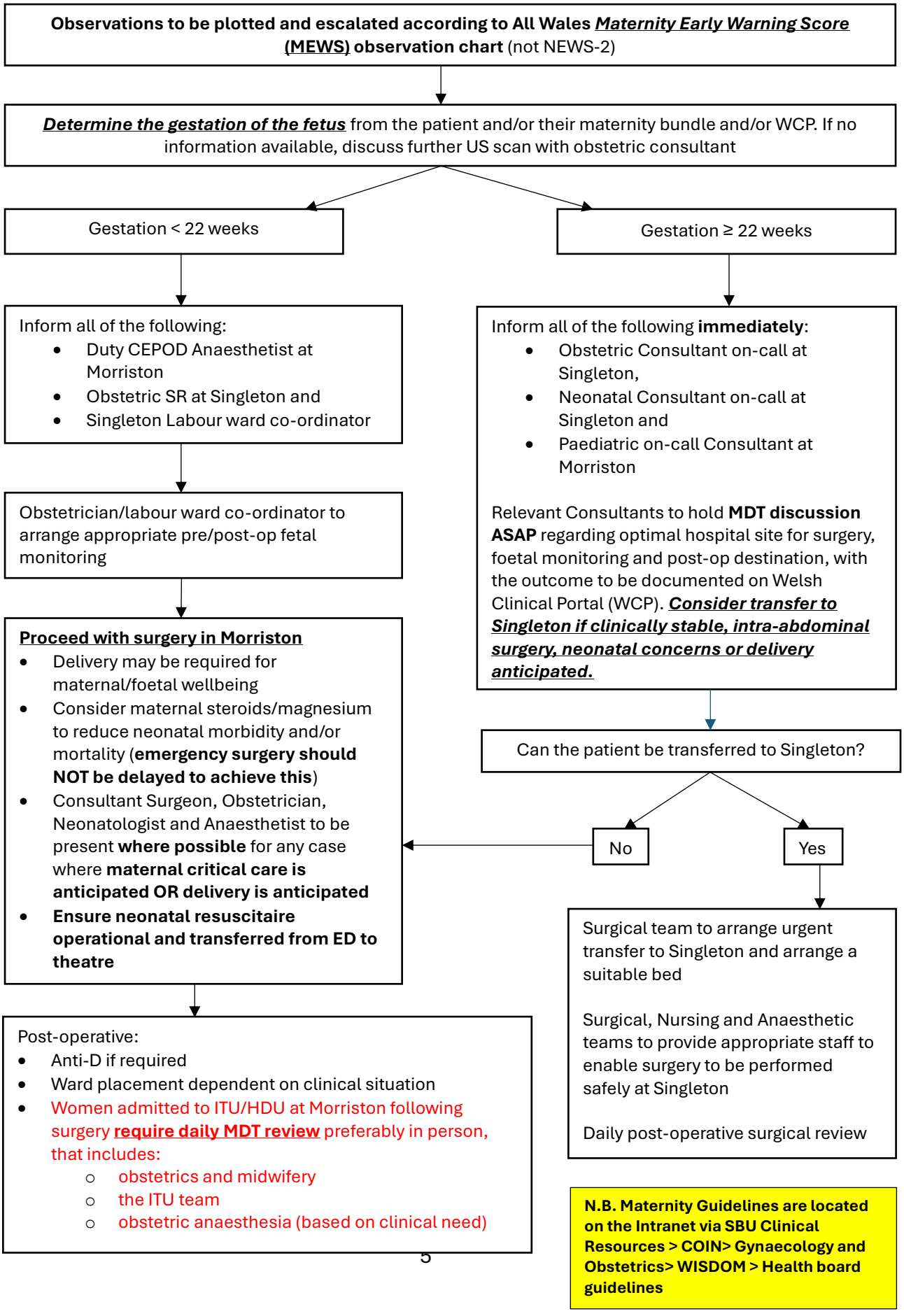
Up to 2% of pregnancies require emergency non-obstetric surgery [1]. The most commonly performed emergency procedure is appendicectomy [2], however emergency cholecystectomies, and surgeries for trauma, malignancy and gynaecological disease are also commonly performed [3].

Abdominal surgery and related sepsis are both known to increase the risks of miscarriage and preterm labour [4]. There is a clear relation between birth outside of a tertiary neonatal hospital requiring ex-utero transfer of the neonate within 48 hours and severe adverse neonatal outcomes (death before discharge or severe brain injury), particularly for extremely preterm infants (< 28/40 gestation) [5]. Guidelines published in the *British Journal of Surgery* therefore recommend that surgical treatment of pregnant women should be undertaken in centres that can also provide neonatal intensive care when necessary [6].

Currently in Swansea Bay, obstetrics and neonatal services are based in Singleton Hospital, where there are no emergency surgery or non-obstetric emergency anaesthetic teams on site. The on-call general surgery team are based at Morriston Hospital, where there is no resident obstetrics, midwifery or neonatal service. The division of specialties has the potential to create confusion as to where best to provide surgery to pregnant patients requiring emergency non-obstetric surgery and consequent delays in care. It also contravenes published guidelines stating that a pregnant woman should never be denied medically necessary surgery or have that surgery delayed because this can adversely affect the pregnant woman and her foetus. [7]

No guidance can cover every situation regarding acute non-obstetric care of the pregnant patient given the current division of services within Swansea Bay University Health Bard. Flexibility within and across teams is essential to give the best possible care to each pregnant patient and their baby.

## 4. Flowchart for the management of pregnant patient requiring potential emergency surgery within Swansea Bay University Health Board presenting to a site with no on-site obstetrics or neonatal services



**5. Guideline for the management of pregnant patient requiring potential emergency surgery within Swansea Bay University Health Board presenting to a site with no on-site obstetrics or neonatal services**

General principles

**For all pregnant patients** presenting for emergency non-obstetric surgery where the **gestational age <22 weeks:**

- Surgical team to inform Obstetric Registrar on-call, Duty CEPOD Anaesthetist at Morriston and Singleton Labour Ward Co-ordinator. **Surgery can proceed on Morriston site with Obstetric/Gynaecological input as appropriate.**

For all pregnant patients presenting for emergency non-obstetric surgery where the **gestational age ≥ 22 weeks**:

- **The on-call Obstetric Consultant at Singleton, Neonatal Consultant on-call at Singleton and General Paediatric Consultant on-call at Morriston must be informed immediately**

- The Surgical team will contact the Consultants listed above plus the General Anaesthetic Consultant on-call, Obstetric Anaesthetic Consultant on-call, Labour Ward Co-ordinator and other relevant personnel to arrange an **urgent MDT Discussion, with the outcome to be documented on Welsh Clinical Portal (WCP).**

- **Most non-abdominal surgery and urgent surgery can be performed on the Morriston site, particularly if delivery is not anticipated**. However, the formal plan for destination of surgery, foetal monitoring and post-operative care destination will need to be decided on a case-by-case basis. This will depend upon the nature of the surgery planned, clinical condition of the patient, whether delivery is anticipated, staffing on both sites and whether there are any significant neonatal concerns.

- **The Singleton Site can be considered for acute surgery if delivery is anticipated and the patient is stable to transfer or there are significant foetal concerns**. However, there would need to be adequate Surgical cover on both sites to allow this to proceed safely.

- If transfer to Singleton is required, the on-call Surgical Team at Morriston will arrange transfer to a suitable bed at Singleton. This will usually be a surgical bed in ECU, ward 2 or ward 4 with visiting input from midwives and/or obstetricians as appropriate. All relevant investigations (for example, group and save blood tests, viral swabs, USS, MRI) should be performed prior to transfer to minimise delay.

- Specific **Maternity Early Warning Score (MEWS) charts** and not the normal NEWS charts should be used for pre- and post-operative monitoring and are available in all acute sites (see Appendix 1).

- For reference **all Maternity Guidelines can be found on WISDOM** (Located in COIN under Gynaecology and Obstetrics or via SBU Clinical Resource > WISDOM > Health Board Guidelines > Swansea Bay UHB > Maternity guidelines)

- Patients requiring admission to **ITU or HDU** in **Morriston** following surgery will require **daily MDT review that includes obstetrician and midwifery input** (and obstetric anaesthesia based on clinical need) preferably in person with the ITU/HDU team.

*Specific situations*

The following approach is recommended in the specific situations set out below:

- **A pregnant patient ≥22 weeks gestation presenting for emergency non-abdominal surgery where delivery is not anticipated:** It is usually appropriate for surgery to proceed in Morriston with Obstetric and Midwifery input deemed appropriate by the MDT discussion. Antenatal and/or foetal wellbeing checks can be carried out on the surgical ward by the Midwifery Team and further input co-ordinated via Obstetric Registrar/Consultant on-call. (A Community Midwife review can be requested through the Band 7 team leader on-duty at Neath-Port Talbot Birth Centre).

- **A pregnant patient ≥22 weeks presenting for emergency abdominal surgery:** Plan to be made via MDT discussion. If delivery anticipated or necessary to facilitate emergency surgery, then transfer to Singleton can be considered if safe to do so. If this is not suitable due to nature of operation or the patient's clinical condition then surgery should proceed in Morriston, and where delivery anticipated see '**protocol for anticipated delivery at Morriston Hospital**' below. It is important to note that if the patient is clinically unstable, urgent treatment should not be delayed due to the pregnancy as this is associated with worse maternal outcomes.

- **A pregnant patient with presenting to the acute Surgical Take in Morriston with no definitive surgical diagnosis or is in labour:** All attempts should be made to transfer her with the baby *in utero* as soon as possible, if it safe to do so (i.e. the labour is not at a late stage, and the patient's condition is sufficiently stable).

*Protocol for **anticipated delivery** at Morriston Hospital*

The following will need to be assembled in a timely manner:

*Staff*

- The Obstetric Consultant on call will be called to arrange appropriate Obstetric attendance at Morriston.
- Midwifery support as arranged via Labour Ward Co-ordinator and Neath Port Talbot Birth Centre Coordinator.
- If Neonatal Consultant/nurse not present, the paediatric team based at Morriston (consisting of a Consultant, middle grade doctor and paediatric nurse) will be the first to respond to offer resuscitation and/or stabilisation to the newborn. The paediatric team can be given direction and advice by the Neonatal Consultant on-call via telephone**.**

- For pregnant patients at 37 weeks gestation or above, the baby is less likely to require significant resuscitation. In such circumstances, the midwife present at delivery can assist the paediatric team in any resuscitation if required.
- For pre-term infants (under 32 weeks gestation) or where there is deemed to be high risk of foetal compromise:
  - Between the hours of 09.00 and 15.30 Monday to Thursday, the neonatal team at Singleton will endeavour to send a team of 1 Neonatal Consultant and 1 Neonatal nurse to Morriston to assist with the resuscitation and stabilisation of the newborn infant, prior to transfer of the newborn to Singleton. Deliveries can take several hours and that there is no guarantee that the consultant can stay beyond their normal hours.
  - Out of hours (outside of 09.00 to 15.30 Monday to Thursday), a Neonatal Consultant and nurse may be able to attend a delivery at Morriston hospital if another Neonatal Consultant can cover Singleton NICU and there is a sufficient number of nurses on Singleton NICU, however this cannot be guaranteed. The neonatal transfer service (CHANTS) will need to be contacted.
- Obstetric Anaesthetist – if another Consultant available to cover Labour Ward in Singleton (this cannot be guaranteed).
- Other staff that could be called to assist, depending on the situation and the location of the patient within Morriston Hospital:
  - Matron for Acute Paediatric Services at Morriston *or* the Nurse-in-Charge for Paediatrics
  - Nurse-in-Charge – Emergency Department
  - Consultant on Call in Emergency Medicine
  - ITU team (including critical care outreach)

*Equipment*

- **Major Obstetric Haemorrhage packs** are kept in all the following: **Main Theatre 2 fridge, Main Theatre Omnicell, ITU South pharmacy and A&E.**
- There is a fully functional newborn resuscitaire in A&E at Morriston Hospital. This would need to be brought to theatre if delivery anticipated and checked that it is fully operational. This will need to be set up by A&E staff and transferred to the appropriate location. If there is no access to the hospital main gas supply where mother delivers, adequate air and oxygen cylinders should be made available for the resuscitaire [Need to include on resuscitaire: ETT fixation systems, hats for baby of all sizes. plastic bags for <28/40 gestation etc]. Instructions for operation kept with reuscitaire.
- **Surfactant** is available in the **A&E Omnicell and on Oakwood HDU**.
- To obtain paediatric 0-ve blood at Morriston hospital – phone porters to collect flying squad blood from the blood bank fridge.
- **On Paediatric HDU at Morriston:** CPAP machines and ventilator. High and low flow oxygen if required.

*Monitoring/Audit and Debriefing*

- The team should assign a member to maintain a record of key actions, this will be required for a post-incident debrief and report. Monitoring and auditing will be discussed at perinatal meetings at Singleton and the Morriston/Singleton paediatric and neonatal joint meetings.

- Following a preterm delivery at Morriston hospital, a hot debrief should be organised.

**Appendix 1: Maternity Early Warning Score (MEWS) Chart (available in all acute areas)**

# Maternity Early Warning Score (MEWS)

Hospital sticker with patient details

NHS

| MEWS score 0 1 2 | A score for each vital sign is required at each entry | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DATE / TIME | | | | | | | | | | | | | DATE / TIME |
| **Respirations** Breaths/min | >=25 | | | | | | | 2 | | | | | | | >=25 |
| | 22-24 | | | | | | | 1 | | | | | | | 22-24 |
| | 18-21 | | | | | | | 0 | | | | | | | 18-21 |
| | 13-17 | | | | | | | | | | | | | | 13-17 |
| | 9-12 | | | | | | | | | | | | | | 9-12 |
| | 7-8 | | | | | | | 1 | | | | | | | 7-8 |
| | <=6 | | | | | | | 2 | | | | | | | <=6 |
| **$Sp0_2$** Oxygen saturation (%) | >=95 | | | | | | | 0 | | | | | | | >=95 |
| | 93-94 | | | | | | | 1 | | | | | | | 93-94 |
| | <=92 | | | | | | | 2 | | | | | | | <=92 |
| **Temperature** °C | >=37.5 | | | | | | | 2 | | | | | | | >=37.5 |
| | 37.3-37.4 | | | | | | | 1 | | | | | | | 37.3-37.4 |
| | 36.8-37.2 | | | | | | | 0 | | | | | | | 36.8-37.2 |
| | 36.2-36.7 | | | | | | | | | | | | | | 36.2-36.7 |
| | 35.7-36.1 | | | | | | | 1 | | | | | | | 35.7-36.1 |
| | <=35.6 | | | | | | | 2 | | | | | | | <=35.6 |
| **Pulse** Beats/min | >=131 | | | | | | | 2 | | | | | | | >=131 |
| | 122-130 | | | | | | | 2 | | | | | | | 122-130 |
| | 113-121 | | | | | | | 1 | | | | | | | 113-121 |
| | 99-112 | | | | | | | 0 | | | | | | | 99-112 |
| | 86-98 | | | | | | | | | | | | | | 86-98 |
| | 71-85 | | | | | | | | | | | | | | 71-85 |
| | 63-70 | | | | | | | 1 | | | | | | | 63-70 |
| | <=62 | | | | | | | 2 | | | | | | | <=62 |
| **Pulse - from 48 hours post birth ONLY** Beats/min Date & time to commence monitoring: | >=108 | | | | | | | 2 | | | | | | | >=108 |
| | 99-107 | | | | | | | 1 | | | | | | | 99-107 |
| | 85-98 | | | | | | | 0 | | | | | | | 85-98 |
| | 71-84 | | | | | | | | | | | | | | 71-84 |
| | 58-70 | | | | | | | | | | | | | | 58-70 |
| | 51-57 | | | | | | | 1 | | | | | | | 51-57 |
| | <=50 | | | | | | | 2 | | | | | | | <=50 |
| **Systolic blood pressure** mmHg | >=175 | | | | | | | 2 | | | | | | | >=175 |
| | 160-174 | | | | | | | 2 | | | | | | | 160-174 |
| | 145-159 | | | | | | | 2 | | | | | | | 145-159 |
| | 136-144 | | | | | | | 1 | | | | | | | 136-144 |
| | 121-135 | | | | | | | 0 | | | | | | | 121-135 |
| | 111-120 | | | | | | | | | | | | | | 111-120 |
| | 101-110 | | | | | | | | | | | | | | 101-110 |
| | 94-100 | | | | | | | 1 | | | | | | | 94-100 |
| | 77-93 | | | | | | | 2 | | | | | | | 77-93 |
| | 61-76 | | | | | | | 2 | | | | | | | 61-76 |
| | <=60 | | | | | | | 2 | | | | | | | <=60 |
| **Diastolic blood pressure** mmHg | >=110 | | | | | | | 2 | | | | | | | >=110 |
| | 97-109 | | | | | | | 2 | | | | | | | 97-109 |
| | 89-96 | | | | | | | 1 | | | | | | | 89-96 |
| | 80-88 | | | | | | | 0 | | | | | | | 80-88 |
| | 70-79 | | | | | | | | | | | | | | 70-79 |
| | 62-69 | | | | | | | | | | | | | | 62-69 |
| | 57-61 | | | | | | | 1 | | | | | | | 57-61 |
| | <=56 | | | | | | | 2 | | | | | | | <=56 |
| **MEWS TOTAL** | | | | | | | | | | | | | | MEWS TOTAL |

| **Additional concerns** - Please see overleaf for additional concern table. If one or more additional concern is present, consider escalation and review. | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Healthcare professional concerned | | | | | | | | | | | | | | |
| Woman/family concerned | | | | | | | | | | | | | | |
| Significant additional therapies (e.g. Oxygen) | | | | | | | | | | | | | | |
| Increased pain (analgesic requirement) | | | | | | | | | | | | | | |
| Significant vaginal bleeding | | | | | | | | | | | | | | |
| Reduced urine output | | | | | | | | | | | | | | |
| Altered level of consciousness/responsiveness | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring frequency | | | | | | | | | | | | | | Monitoring |
| Escalation of care YES/NO | | | | | | | | | | | | | | Escalation |
| Initials | | | | | | | | | | | | | | Initials |

Refer to back page for thresholds and triggers

# Maternity Early Warning Score (MEWS)

**Taking the total MEWS score generated, escalate according to the threshold and trigger table.**

| | | Score | | | | |
|---|---|---|---|---|---|---|
| | | 2 | 1 | 0 | 1 | 2 |
| Vital Sign | **Respirations** Breaths/min | <=6 | 7-8 | 9-21 | 22-24 | >=25 |
| | **$SpO_2$** Oxygen saturation (%) | <=92 | 93-94 | >=95 | - | - |
| | **Temperature** °C | <=35.6 | 35.7-36.1 | 36.2-37.2 | 37.3-37.4 | >=37.5 |
| | **Pulse** Beats/min | <=62 | 63-70 | 71-112 | 113-121 | >=122 |
| | **Pulse (from 48 hours post birth)** Beats/min | <=50 | 51-57 | 58-98 | 99-107 | >=108 |
| | **Systolic blood pressure** mmHg | <=93 | 94-100 | 101-135 | 136-144 | >=145 |
| | **Diastolic blood pressure** mmHg | <=56 | 57-61 | 62-88 | 89-96 | >=97 |

+

| **Additional concerns** | |
|---|---|
| **If one or more of these additional concerns are present, consider:**<br>1. Increasing the frequency of observations to a minimum of every 30 minutes<br>2. Escalate in line with a low-medium level of concern even if MEWS less than 2<br>3. Where MEWS is greater than 2 raising the level of concern to the next category. | Healthcare professional concerned<br>Woman/family concerned<br>Significant additional therapies (e.g. Oxygen)<br>Increased pain (+/-or analgesic requirement)<br>Significant vaginal bleeding<br>Reduced urine output<br>Decreased level of consciousness/responsiveness |

↓

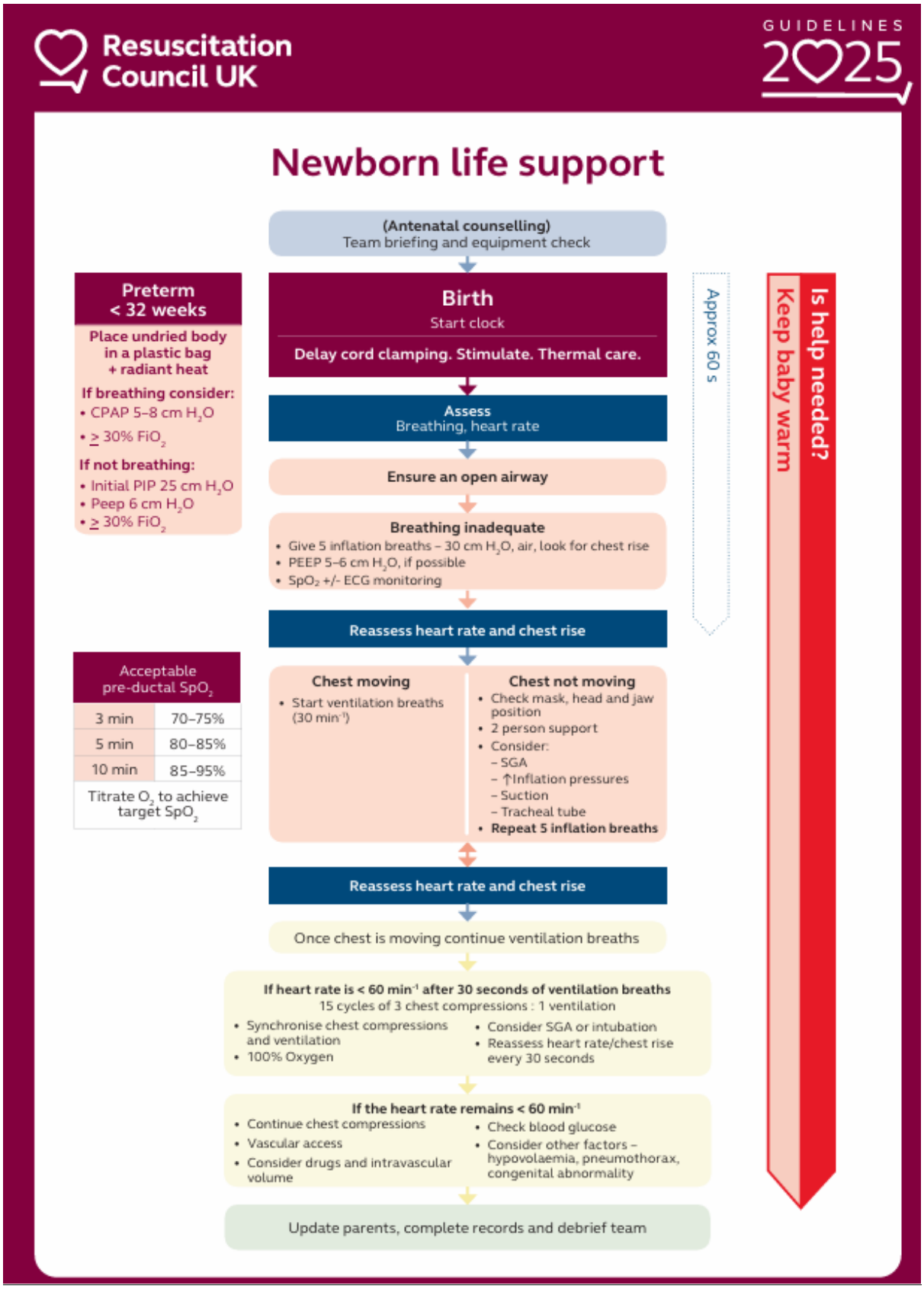
**Thresholds and triggers**

- The grade of medical team member indicated as the primary contact for each level of clinical concern is a guide and may need to be adapted depending on the local skill mix within that care setting or organisation

| Level of concern | Low | Low-medium | Medium | High |
|---|---|---|---|---|
| MEWS | 0-1 | 2-4 | 5-7 | 8 or more |
| Primary escalation & response (Use SBAR framework) | | Review by midwife in charge | Urgent review by midwife in charge | Immediate review by midwife in charge |
| | | Request review by ST1/2 or equivalent | Urgent review by ST3+ or equivalent and consultant made aware of plan<br>Consider anaesthetic review | Immediate review by ST3+ or equivalent, consultant and anaesthetic team<br>Consider review by outreach team |
| Medical review timing | | Within 30 minutes | Within 15 minutes | Immediate |
| Minimal vital signs recording until medical review/ongoing plan | Continue with current observation frequency | Reassess observations within 30 minutes & document ongoing plan | Reassess observations within 15 minutes & document ongoing plan | Continuous observations |
| Secondary contact | | ST3+ or equivalent | Consultant or equivalent | Clinical outreach team or equivalent |

- When the primary team member(s) contacted is unable to attend or fails to attend within the expected time for the level of clinical concern, escalation to the secondary contact is required
- The secondary contact would be expected to attend within the initial medical review timing, calculated from the documented time of primary escalation
- The section **pulse (from 48 hours after birth)** cut-offs should be used for all women from 48 hours after birth. The time and date from which these values should be used should be entered on the front of the chart.

## Appendix 2: NLS Algorithm



## Appendix 3: Managing the preterm infant at birth

*Summary*

- Most preterm babies need support and 'assisted transition' rather than resuscitation
- Assisted transition is similar to resuscitation of a term baby but altered approach which includes:
    - delayed cord clamping
    - keeping warm
    - gentle lung inflation
    - using a saturation monitor

*Which babies to worry about*

Term babies are defined as those of 37 or more weeks gestation. Babies of 34 to 36 weeks gestation are, in general, no more likely to have problems at delivery than term babies and can be treated similarly. Babies of 31 to 33 weeks gestation are slightly more vulnerable, but many have little problem at delivery or need to be managed as 30 weeks or below. ***Babies born at 30 weeks and below are different and it is these babies that are the primary concern of this appendix.***

*What's the difference?*

The smaller and earlier in gestation the baby the quicker they get cold, the more fragile the lungs, the less good they are at breathing, the fewer reserves they may have and the more likely you are to find a pulse oximeter useful (both for heart rate and oxygenation).

*"Assistance" vs. "Resuscitation"*

Most very preterm babies need help with transition to air breathing not resuscitation as such. They required careful assessment and gentle support via the following approach:

- delayed cord clamping
- keeping warm
- gentle lung inflation
- using a saturation monitor

1. Delayed cord clamping

Provided babies ***can be kept warm,*** delay cord clamping for at least 60 s whilst breathing is established. This approach requires ***good communication*** and ***teamwork***. Resuscitation, if required remains the priority.

Because preterm babies are generally in reasonable condition at delivery you will almost always be able to pause for a minute to allow placental transfusion to take place – **pay particular attention to keeping the baby warm.**

The ILCOR review of human studies suggested delayed cord clamping of at least 60 seconds for all preterm babies not requiring resuscitation. Ideally, delayed cord clamping should be performed in all preterm deliveries where the placenta is still attached to the uterus. This approach requires communication and teamwork by all midwifery, obstetric and paediatric staff involved. **Note that resuscitation may require clamping and cutting of the cord.**

There is insufficient evidence to advise on optimal position during delayed cord clamping. A pragmatic approach is to have the baby between legs or on mother's chest or abdomen to avoid having the baby at a level where gravity might have an adverse effect on placental transfer.

2. Keep warm

The preterm baby is particularly vulnerable to heat loss and subsequent hypothermia, which itself has an association with increased mortality. Reasons include thin, immature skin; reduced subcutaneous fat; poor vasomotor tone and increased body surface area to mass ratio.

Meticulous attention to temperature and preventing hypothermia is an integral part of the approach to pre-term delivery. Keeping these very small babies warm is best achieved by placing them immediately – while still wet – in a suitable plastic bag and placed under a radiant heater. Consider use of thermal mattresses.

3. Gentle lung inflation

Many of these babies, despite being very preterm, may be able to breathe on their own initially. If the baby is attempting to breathe then this can be made considerably easier for the baby by applying CPAP using a mask and T-piece. Start at 5 - 8 cmH2O.

If the **baby is not breathing** and needs ventilation, PEEP helps recruitment of alveoli and makes it easier. Start inflation with lower pressures than Term infants: 20 - 25 cmH20 is likely to be sufficient but needs to be increased if there is no chest movement. Use PEEP if you can of around 5 cmH2O.

**Avoid over-inflation -** the lungs of preterm babies are more fragile than those of term babies and the chest wall is compliant. If you overinflate them you are likely to damage the tissue. This damage will set in motion an inflammatory cascade which will predispose to bronchopulmonary dysplasia.

Once you have inflated the lungs then gently ventilate the baby at a rate of about 30 breaths per minute. You will be likely to need pressures of 20 – 25 for the first few minutes but you may then find that a lower pressure will be sufficient - as the compliance of the lung improves. *If the chest is moving very obviously you are probably using higher pressures than you need and you may be causing lung damage.*

Once the lung is sufficiently inflated/aerated the heart rate will usually stabilise above 100 beats per minute.

4. Use a pulse oximeter

**AVOID hyperoxia and AVOID hypoxia**. Exposing baby to high concentrations of oxygen can be harmful, as can babies having very low oxygen levels. This is why we should aim to attach a pulse oximeter at the earliest opportunity to guide management in the delivery room and beyond.

**Fix probe to RIGHT wrist or hand**. This will rapidly give you an accurate heart rate and also a measure of oxygen saturation. In babies at birth the saturation in the vessels arising from the aorta before the entry of the arterial duct – i.e. those supplying the head and the right hand – will have higher oxygen saturations than those arising after duct insertion.

The right-hand saturations are shown on the NLS algorithm. We use the same values for term and preterm babies.

It is very important not to expose any baby, but especially any pre-term baby, to excessive amounts of oxygen. *Babies achieving 95% saturation certainly don't need any additional oxygen.*

## Appendix 4: Anaesthetic considerations for pregnant patients [8] [9]

*Summary*

- Strategy for caring for pregnant patient undergoing non-obstetric surgery can be summarised by concept that *'what is good for mother's health tends to be good for health of the foetus'*
- Paramount importance to maintain normal maternal oxygenation, acid-base status and uteroplacental perfusion will help optimise foetal outcomes
- Delaying medically necessary interventions because of pregnancy is associated with worse maternal and foetal outcomes
- No anaesthetic agent in current use is teratogenic in clinical doses and concentrations

*Preparation*

- Obstetric anaesthetic consultant should ideally be informed in all cases over 22 weeks gestation, and in any other case where advice is required
- Ensure blood tests for full blood count (FBC) and group and screen (G&S) are sent (other bloods dependent on clinical situation). Note Rhesus status and if rhesus –ve, consider anti-D. **Note: G&S are only valid for 72-hours in obstetric patients**
- Consider antacid prophylaxis: Omeprazole 20mg and Metoclopramide 10mg PO pre-operatively
- Give Sodium Citrate 0.3M oral solution prior to induction in patients > 16-weeks' gestation. This is available in the Main and Plastics Theatres Omnicells and in the Omnicell between wards K & L.
- Ensure availability of Syntocinon, Ergometrine and Hemabate® in operating theatre. This can be found as part of the Major Obstetric Haemorrhage pack located in the **Main Theatre 2 fridge, Main Theatre Omnicell, ITU South pharmacy and A&E.**

*Intraoperative*

- Positioning: 15° left lateral tilt mandatory after 18-weeks and consider at earlier gestation if hypotensive, symptomatic, or large bump (e.g. multiple pregnancy)
- Monitoring: as per AABGI standard. No additional monitoring required because of pregnancy
- Foetal heart rate (FHR) monitoring usually undertaken pre- and post-op as per Obstetric/Midwifery plan. Intra-operative monitoring of FHR should be decided by MDT on a case-by-case basis. No evidence that intra-operative monitoring improves outcomes
- Regional technique preferable where feasible
    - Smaller volumes of local anaesthetic required for spinal/epidural blockade.
    - Spinal dose of 2.5ml 0.5% heavy bupivacaine + 0.1mg morphine + 20mcg fentanyl most commonly used to achieve block to T4 for caesarean birth at term

    - Volumes greater than 2.5ml 0.5% heavy bupivacaine are used in preterm and intra-uterine growth restriction (IUGR) etc
    - Advice can be obtained from Obstetric Anaesthetic Consultant
- Uteroplacental circulation is not auto regulated and perfusion is entirely dependent on maintenance of adequate maternal blood pressure and cardiac output. Placental perfusion must be maintained by rapid treatment of any hypotension. SBP within 20% of pre-operative levels (see section on GA below for further details)
- If GA, careful pre-oxygenation and RSI after 16-18 weeks gestation as per routine practice
    - Propofol and rocuronium or thiopentone and suxamethonium are both suitable for RSI in obstetric patients
    - In the presence of hypertension/pre-eclampsia, the Consultant Obstetric Anaesthetist should be present wherever possible. Use of a short acting opioid (e.g. alfentanil) to obtund response to intubation
    - All opioids considered safe, but ketamine should be avoided as thought to increase uterine tone
- $ETCO_2$ should be kept in the normal pregnant range (3.7-4.2kPa)
    - Consider arterial line and $PaCO_2$ monitoring in laparoscopic patients as $PaCO_2$ may be significantly greater than $ETCO_2$
- Maintain SBP within 20% of pre-operative levels
    - Phenylephrine is the preferred vasopressor by infusion (100 micrograms/ml) and titrated to BP
    - Boluses of metaraminol are also safe to use
- Unless confronted with a 'cannot intubate, cannot ventilate' scenario, the 2019 Society for Obstetric Anaesthesia and Perinatology consensus statement on sugammadex recommends ***against*** its use during pregnancy because of concerns about progesterone binding. Reversal with neostigmine/glycopyrrolate is considered safe [10]
- Consider intra-operative use of Flowtrons in view of increased risk of thromboembolism
- Analgesia - paracetamol, opioids and regional techniques can be used. Avoid NSAIDs (unless post-delivery of foetus if no other contraindications)

**If delivery required:**

- Syntocinon slow IV Bolus ***after*** umbilical cord cut (5 units), can repeat a second bolus as requested by obstetrician
- Tranexamic acid 1 g IV, repeated after 30 minutes if required
- If Syntocinon infusion requested: 40 units of Syntocinon in 500mls 0.9% Saline given at rate of 125 mls/hr via Alaris pump
- Further uterotonics at discretion of obstetrician
- Ergometrine (if required) should be given either 500mcg IM **OR** diluted as a slow IV injection. **Contraindicated in hypertension**. Concurrent antiemetic administration advised
- Carboprost/Hemabate® (if required) 250mcg IM injection repeated every 15 mins up to a maxiumum of 8 doses. **Avoid in asthmatics**

**Postoperative**

- Thromboprophylaxis – LMWH as per maternal ***booking*** weight (use pregnancy specific VTE scoring system to calculate dose – available on WISDOM)
- FHR monitoring as per Obstetric plan
- Avoid codeine in breastfeeding women

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Maternity Services

Checklist for Clinical Guidelines being Submitted for Approval

| | |
|---|---|
| Title of Guideline: | SOP for pregnant patients presenting for emergency non-obstetric surgery in Swansea Bay UHB |
| Name(s) of Author: | Mr Rami Radwan (Surgical Consultant)<br>Miss Najiya Ali (Obstetric Consultant)<br>Dr Rachel Scale (Anaesthetic Consultant)<br>Dr Nicholas Cooper (Anaesthetic Trainee) |
| Chair of Group or Committee approving submission: | Intrapartum Forum |
| Brief outline giving reasons for document being submitted for ratification | |
| Details of persons included in consultation process: | Intrapartum Forum |
| Name of Pharmacist (mandatory if drugs involved): | |
| Issue / Version No: | 1 |
| Please list any policies/guidelines this document will supercede: | |
| Date approved by Group: | 10 June 2026 |
| Next Review / Guideline Expiry: | 10 June 2029 |
| Please indicate key words you wish to be linked to document | Non obstetric surgery<br>Emegergency Surgery on pregnant patient |