



**Coronavirus (COVID-19): guidance  
on treating patients**

Guidance from the Chief Medical  
Officer (CMO)

# COVID-19 position statement: Maternal critical care provision

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## Summary of revisions

Date	Version	Revisions
19/05/20	1	Original version
25/11/20	2	<p><b>Section 1:</b> minor revisions to update relevant population statistics.</p> <p><b>Section 2:</b> including <b>Figure 1</b>, changed to reflect community testing strategy, highlighting risk factors for deterioration and reassessment of VTE.</p> <p><b>Section 3.1:</b> ‘acute abdominal’ atypical symptoms changed to ‘abdominal’; additions on use of remdesivir, recommended steroids, and age, obesity, Black or Asian ethnicity; clarification that individual decisions require input from senior staff; additions on LMWH regimen, initial blood tests and initiating critical care interventions before admission to ICU.</p> <p><b>Section 3.2:</b> addition of flow chart on oxygen management.</p> <p><b>Section 4:</b> addition of awareness of MEWS charts, physiological parameters and obstetric escalation policy for ICU staff, and explicit reference made to RCOA’s guidance on enhanced maternal care and recruitment to RECOVERY trial.</p>

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## Introduction

The purpose of this guideline is to provide NHSScotland with advice on minimising obstetric-related critical care admissions and the management of sicker obstetric patients during the COVID-19 pandemic.

This guideline is for clinical advisors in NHS 24 and COVID-19 community assessment hubs, midwives, obstetricians, physicians, obstetric anaesthetists and critical care staff.

The recommendations are based on expert opinion.

## Recommendations

### Antenatal

- Be proactive in monitoring and managing anaemia so that women are not anaemic upon admission during labour.
- When discussing management of the third stage of labour antenatally do this within the context of adaptations to routine maternity services due to COVID-19. Endorse active management for all.
- Labour should be induced only if medically indicated. Promote home/outpatient induction with a balloon catheter.<sup>1</sup>
- Plan for delivery of high-risk pregnancies with a consultant-led multidisciplinary team (MDT).
- ALL pregnant women assessed and/or admitted with respiratory symptoms must be seen or discussed with an obstetrician and have daily physician and obstetric review irrespective of location of secondary care.
- Women of Black, Asian and other minority ethnic groups are at increased risk of COVID-19 and require proactive management, such as a lower threshold for testing.

### Intrapartum

#### Midwifery

- Be mindful of the impact and value of proactive vigilant 1-to-1 midwifery care to increase physiological birth, improve outcomes and experience of the pregnant woman, reduce interventions and facilitate early discharge.<sup>2</sup>
- Support regular risk assessment, monitoring of progress and cardiotocography (CTG) review.
- Support and encourage midwifery that facilitates progress through positioning and relaxation, and hydration.

### Midwifery and obstetrics

- Pregnant women are already hypercoagulable so stringent adherence to obstetric anticoagulation policies is required.
- Assess the risk of postpartum haemorrhage (PPH) on admission to the labour ward and regularly throughout labour.
- ICU should be contacted if a woman is requiring  $\geq 40\%$  facial mask oxygen to maintain oxygen saturations  $>94\%$ .
- Senior review of CTGs: in cases of fetal bradycardia, use in utero resuscitation guidelines with the aim of reversing or improving fetal distress, allowing time for regional techniques rather than general anaesthesia.
- Active management of the third stage of labour for everyone with all forms of delivery.
- Follow PPH protocol early (ensure staff are up to date), including bimanual uterine compression, stepwise uterotonics and early tranexamic acid.
- Utilise point of care testing – haemacue, blood gas analysers and rotational thromboelastometry (ROTEM) or thromboelastography (TEG) if available.
- Keep the patient warm.
- Encourage use of bakri balloons.
- Consider blood earlier – liberal transfusion triggers.

### Postnatal

- Strongly encourage long-acting contraception to prevent short interval pregnancies.
- Liberal use of postnatal intravenous iron.

## 1. Clinical context

Pregnant women will get SARS-CoV-2 infection (leading to coronavirus 2019 (COVID-19) illness) in the same way as the rest of the population. Most pregnant women will already be under the care of maternity professionals. Maternity care operates at both community and acute levels, and occupies a distinct place in the healthcare landscape. Pregnant women will need some distinct advice and care in relation to coronavirus because of the unique physiological changes of pregnancy.

In the UK, 427 pregnant women required admission to hospital with confirmed SARS-CoV-2 infection between 1 March and 14 April 2020, representing an estimated incidence of 4.9 per 1,000 maternities (95% CI 4.5 to 5.4 per 1,000 maternities).<sup>3</sup> Very few of these were from Scotland. Of these 427 pregnant women 41 required critical care.

The Intensive Care National Audit Research Centre (ICNARC) provides an audit of patient outcomes from all adult, general critical care units (intensive care and combined intensive care/high dependency units) in England, Wales and Northern Ireland. During the pandemic, ICNARC is reporting on patients in ICU who are critically ill with COVID-19. ICNARC reported that 9% of female patients of childbearing age who were critically ill with confirmed COVID-19 in ICU (up to 31 August 2020) were pregnant or recently pregnant.<sup>4</sup>

A review of maternal deaths in the UK between 1 March and 31 May 2020 reported 10 deaths in women who had COVID-19. All of these deaths were postnatal. Seven of these women died as a direct result of COVID-19, eight were in the third trimester and seven were from Black and minority ethnic groups. Very few had pre-existing disease.<sup>5</sup>

In 2019 there were 104 recently pregnant and 20 pregnant women admitted to ICU in Scotland.<sup>6</sup> Obstetric haemorrhage is the most common reason for admission, mainly on the day of birth and in the immediate postpartum period.<sup>2</sup>

## 2. Community assessment of pregnant women

Pregnant women with symptoms of COVID-19 should arrange testing as per national guidance. If the test is positive they should contact their local maternity service as soon as possible, ahead of their next scheduled antenatal appointment.

The pathway depicted in [Figure 1](#) describes how to assess pregnant women to determine their route into care. If they test positive for COVID-19 and have mild respiratory symptoms, they are advised to stay at home and self-isolate. In addition, as COVID-19 is a transient risk factor, they require a venous thromboembolism (VTE) risk assessment. This should be carried out by maternity services and can be done remotely by phone or video consultation.

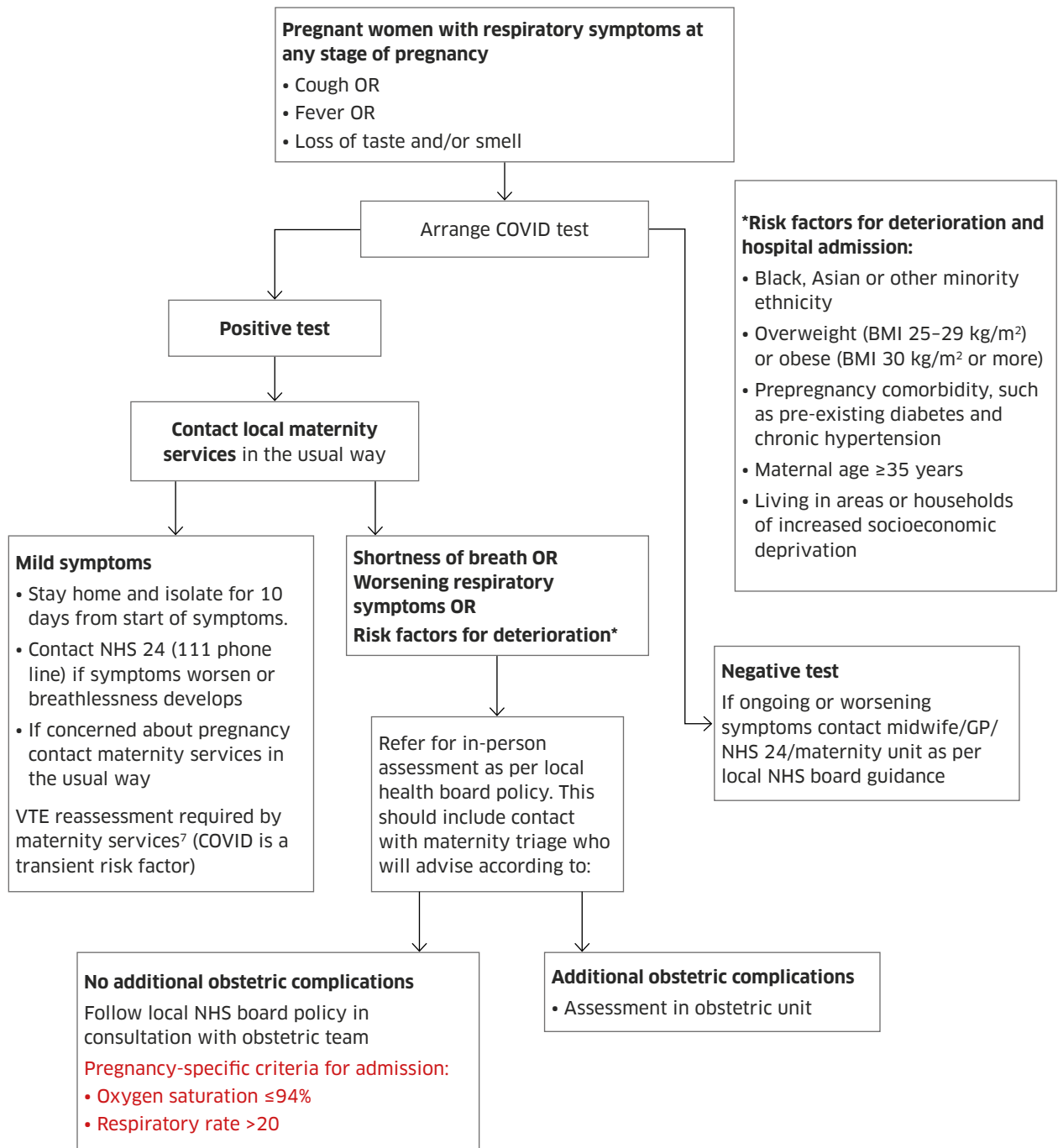
COVID-19-symptomatic women who are in labour or have an additional obstetric problem such as vaginal bleeding should be referred to their local maternity unit for combined assessment by an obstetrician and a physician in an obstetric unit with isolation facilities.

Women with no obstetric issues but worsening respiratory symptoms, breathlessness or risk factors for deterioration should be assessed in person and in consultation with an obstetrician. They should NOT be referred to the local COVID community hub. Their point of assessment will be a secondary care setting, either through a COVID-19 assessment centre or the local maternity triage unit. Obstetric input must be available at the point of assessment.

Those with a negative test but with ongoing or worsening respiratory symptoms should be advised to contact their midwife, GP, NHS 24 or maternity unit, as per local NHS board guidance for assessment in person.

There are pregnancy-specific respiratory symptom criteria for admission to secondary care, which reflect the differing physiology of pregnancy. It is recommended that pregnant women with oxygen saturation  $\leq 94\%$  or respiratory rate  $>20$  are admitted. ALL pregnant women assessed and/or admitted with respiratory symptoms must be seen by or discussed with an obstetrician and have daily physician and obstetric review irrespective of the location of their secondary care.

Figure 1: Assessment of pregnant women with possible COVID-19





## 3. Management of pregnant women in maternity settings

### 3.1 Key principles

The following points are key principles in the management of pregnant women in secondary care maternity settings.

- Be mindful of clinical symptoms of COVID-19 including atypical presentation (abdominal, neurological or cardiac symptoms). Have a low threshold for testing if clinically suspected.
- Consider the use of remdesivir in pregnant women with suspected or confirmed COVID-19 who are clinically deteriorating.<sup>7</sup>
- Although dexamethasone has been found to reduce mortality in patients with COVID-19, prednisolone or hydrocortisone remain the recommended steroids for use in the obstetric population. Dexamethasone should not be given to obstetric patients in ICU, as this steroid crosses the placenta.<sup>8</sup>
- Proactive management is required for older women, those with obesity and/or those of Black, Asian or other minority ethnicity, as these groups are known to be at increased risk of COVID-19.
- Aim for euvolaemia.
- Conduct invasive monitoring, eg arterial blood gas monitoring, early to aid vasopressor titration.
- Consider delivery, especially if worsening respiratory function but also consider mode of delivery and type of anaesthetic. There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses. Epidural analgesia should therefore be recommended in labour, to women with suspected or confirmed COVID-19 to minimise the need for general anaesthesia if urgent intervention for birth is needed.<sup>7</sup> However if a pregnant woman is significantly unwell with respiratory distress or cardiovascular compromise then regional anaesthesia is not appropriate. Decisions should be made on an individual basis, with input from senior staff as required.
- Use the Scottish Maternity Early Warning System (MEWS) for monitoring.<sup>9</sup>
- Increased rates of deep vein thrombosis (DVT), pulmonary embolism (PE) and stroke have been reported. Pregnant women are already hypercoagulable so stringent adherence to obstetric anticoagulation policies is required.
- In maternity care (including obstetric high-dependency unit), standard low-molecular-weight heparin (LMWH) dosing is sufficient. In critical care, a higher LMWH strategy should be considered, especially if inflammatory markers are raised.<sup>5,7</sup>
- Initial blood tests (fibrinogen, pro-calcitonin and D-dimer) should be carried out, as with other patient populations, to assess hyperinflammation. However, D-dimer is not useful in pregnancy as a marker for thrombosis.<sup>10</sup>
- Women may not feel breathless despite having a raised respiratory rate and/or having significant hypoxia.
- If mechanical ventilation is indicated, delivery should be actively considered, particularly where proning may be required (relative contraindication during the second and third trimesters).<sup>11</sup> Delivery should be discussed on a case-by-case basis at an MDT meeting.
- If there are critical care bed pressures, ensure that ICU staff review the patient and create a plan for management in conjunction with obstetric anaesthesia. Critical care interventions can be instituted before admission to intensive care.<sup>5</sup>

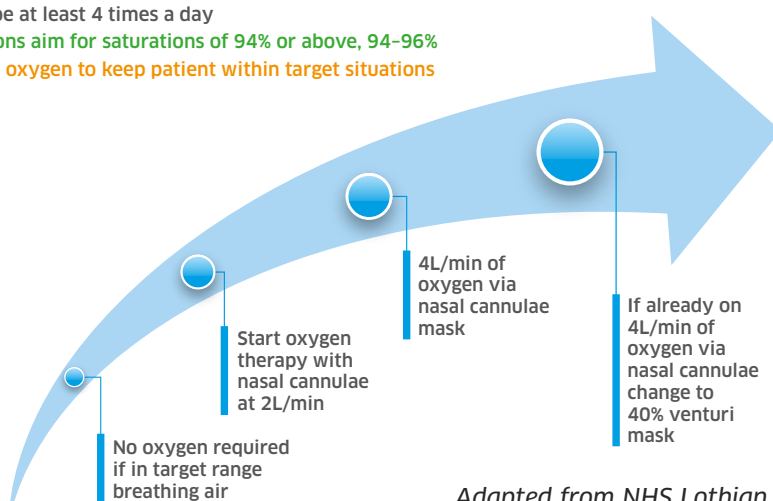
- A daily MDT discussion should be held with the ICU team regarding ongoing location of care as this may change over the course of the pandemic.

### 3.2 Criteria for referral to intensive care

Oxygen saturation and oxygen requirement are important triggers for referral to ICU (*see Figure 2*). The target oxygen saturation is >94% and oxygen should be prescribed to limit waste. **ICU should be contacted if a woman is requiring  $\geq 40\%$  facial mask oxygen to maintain oxygen saturations >94%.**

Figure 2: Oxygen management during COVID-19 in maternity care

- All patients must be prescribed a target range for their oxygen saturations on admission
- Observations should be at least 4 times a day
- In maternity populations aim for saturations of 94% or above, 94-96%
- Increase and decrease oxygen to keep patient within target situations



Escalate for urgent medical review with referral to critical care if:

- rapidly increasing oxygen requirement
- requiring 40% oxygen or more to maintain saturation >94%
- persistent significant tachypnoea
  - rising respiratory rate
  - RR > 26 severe
- hypotension/drowsiness

Adapted from NHS Lothian general respiratory flowchart

Whilst every effort should be made to prevent and manage obstetric-related morbidity in maternity areas, there will still be a need for critical care resource, such as in the examples below:

- women requiring advanced respiratory support
- women requiring inotropes or multiple vasopressors
- women with complex airway issues for example, post cardiorespiratory arrest/anaphylaxis
- women with renal impairment requiring haemofiltration
- women with central nervous system (CNS) issues for example, cerebrovascular accident (CVA) or cerebral venous sinus thrombosis (CVST)
- women with multiorgan failure, irrespective of cause
- women with ongoing resuscitation requirement.

This list is not exhaustive.

Although the quick Sepsis Related Organ Failure Assessment score (qSOFA) may identify patients with suspected infection who are at greater risk of a poor outcome, it is not validated in pregnancy and should not be used in this group.

Early discussion with ICU staff about pregnant women being considered for ICU admission is essential. Such discussions should be with the MDT, including, as a minimum, a consultant in ICU, an obstetrician, an obstetric anaesthetist and a neonatologist (depending on gestation and likelihood of delivery being required to facilitate optimal ICU care).

## 4. Management of pregnant women in intensive care

The overarching principles for critical care of pregnant women can be found in the Royal College of Anaesthetists' guideline on [Care of the Critically Ill Woman in Childbirth; Enhanced Maternal Care](#).<sup>12</sup> Whilst in ICU there must be MDT ward rounds, clear lines of communication and escalation. ICU staff should be aware of MEWS charts. If women are being cared for in non-maternity settings, staff should be aware of the different physiological parameters of pregnancy and the obstetric escalation policy.<sup>13</sup> For example, if a pregnant woman requires blood, Group and Save (G&S) test results are valid for only 72 hours.

In those requiring advanced respiratory support, if ventilation is required, strongly consider delivery as proning is a mainstay of treatment and difficult to achieve in later gestations. This decision needs to be individualised and achieved by MDT decision. Delivery will also aid ventilation by relieving pregnancy-specific respiratory changes.

Pregnant and recently pregnant women can be recruited into the RECOVERY trial.<sup>8</sup>

## 5. Education

### 5.1 Upskilling requirements

Each obstetric unit has been asked to consider pregnant women who could be looked after in an obstetric HDU setting and what would be required to achieve this. Protected skills teaching time will be required for staff upskilling and time allocated for this, concentrating initially on previously upskilled staff as a cohort if possible. This will depend on the level of obstetric unit. Level 3 maternity units will be better placed to provide this care than level 2 units.

The key skills to develop (and examples of available training resources) include:

- Recognition of the deteriorating patient (eg MEWS<sup>9</sup>, TURAS Learn<sup>14</sup>)
- Performing ECG and basic interpretation (eg TURAS Learn<sup>15</sup>)
- Invasive monitoring, care of arterial lines, blood sampling and basic ABG interpretation (eg TURAS Learn<sup>16,17</sup>)
- Care of central venous catheters (CVC) and central venous pressure (CVP) lines, blood sampling, drug delivery and removal (eg TURAS Learn<sup>14</sup>)
- CVS support – single vasopressors.

### 5.2 Upskilling resources

Maternity units should adopt a process of continuous practice development augmented by input from education teams with daily refresher sessions and small group teaching. Midwives with existing knowledge in enhanced maternal care have a key role in cascading critical care knowledge and skills.<sup>12</sup>

The Scottish Maternity REACTS ([Recognition, Evaluation, Assessment, Critical Treatment and Stabilisation](#)) course provides staff with the supplementary knowledge and skills necessary to help them recognise and deal appropriately with women requiring obstetric critical care and transfer where appropriate.

NHS Education for Scotland provides [resources](#) to support all professionals caring for critically ill pregnant women. It also provides specific training materials for maternity professionals in neonatal resuscitation and management of a range of obstetric emergencies.

The Royal College of Obstetricians and Gynaecologists, Royal College of Midwives, Royal College of Paediatrics and Child Health, Health Protection Scotland and Public Health England Coronavirus (COVID-19) guidance can be found [here](#).

The Royal College of Obstetricians and Gynaecologists provides [a range of educational and support resources](#) for women's healthcare professionals.

Practical Obstetric MultiProfessional Training (PROMPT) provides training packages, materials and tools to promote sustainable, best practice and reduce maternal and neonatal mortality and morbidity. During the pandemic they have published a [COVID-19 maternity care newsletter](#) to help time-pressed clinicians keep up-to-date with the relevant national guidance and evidence.

## 6. Methodology

**This Guidance has been produced on behalf of the Scottish Government's Chief Medical Officer** in response to the COVID-19 pandemic situation and so has not followed the standard process used by SIGN to develop guidelines. The recommendations are based on expert opinion, with rapid expert peer review as assurance.

### 6.1 Updating the guidance

This guidance will be reviewed if significant new evidence emerges.

### 6.2 Contributors

<b>Ms Jaki Lambert</b>	Head of Midwifery, Argyll and Bute, NHS Highland
<b>Dr Kerry Litchfield</b>	Consultant Obstetric Anaesthetist, NHS Greater Glasgow and Clyde
<b>Dr Corinne Love</b>	Senior Medical Officer (Obstetrics), Scottish Government and Consultant Obstetrician, NHS Lothian
<b>Dr Moray Nairn</b>	Programme Manager, Scottish Intercollegiate Guidelines Network (SIGN)
<b>Miss Catriona Vernal</b>	Programme Manager, SIGN
<b>Dr Arlene Wise</b>	Consultant Obstetric Anaesthetist, NHS Lothian

### 6.3 Peer review

The original version of this document was reviewed by NHS board Clinical Directors and Heads of Midwifery.

### 6.4 Editorial review

As a final quality check, the guideline was reviewed by an editorial group, as follows:

<b>Professor Tom Evans</b>	Professor of Molecular Microbiology, Institute of Infection, Immunity & Inflammation, University of Glasgow and Consultant Infectious Disease Physician, NHS Greater Glasgow & Clyde
<b>Dr Roberta James</b>	Programme Lead, SIGN
<b>Dr Safia Qureshi</b>	Director of Evidence, Healthcare Improvement Scotland

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