

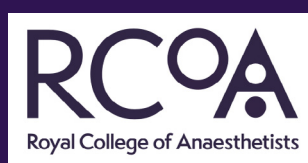


Royal College of
Obstetricians &
Gynaecologists

Coronavirus (COVID-19) Infection in Pregnancy

Information for healthcare professionals

Version 1.1: Published Friday 24 July 2020



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Summary of updates

Previous updates have been summarised in Appendix I. New updates for this version of the guideline are summarised here.

Version	Date	Summary of changes
II	24.7.20	1.1: Updated methodology about search strategies and the review process.
II	24.7.20	1.3: Updated evidence that there is a low rate of vertical transmission and possible transplacental transmission.
II	24.7.20	1.4: Updated evidence that pregnant women are not necessarily more susceptible to SARS-CoV-2 than the general population.
II	24.7.20	1.5: Updated evidence identifying the risk factors of Black, Asian and minority ethnicity (BAME), obesity and comorbidities in pregnant women admitted with COVID-19.
II	24.7.20	1.6: Updated evidence on possible fetal growth restriction associated with COVID-19.
II	24.7.20	<p>2.1: Updated advice:</p> <ul style="list-style-type: none"> Units should employ teleconferencing and videoconferencing where possible and consider which appointments can be most appropriately conducted remotely, especially in areas of local lockdown to minimise hospital attendance. Particular consideration should be given to pregnant women who are 'shielding' or have been 'shielding'. Shared waiting areas should be avoided. Units should appoint a named midwife or consultant to coordinate care for women forced to miss appointments due to self-isolation or a positive test <p>Missed appointments should be reviewed and either rescheduled if a face-to-face review is necessary or converted to a remote appointment.</p> <p>Evidence added on the possible increased incidence of stillbirths in women without symptoms suggestive of COVID-19 in the pandemic compared to pre-pandemic periods.</p>

Version	Date	Summary of changes
II	24.7.20	<p>2.2: Updated advice:</p> <ul style="list-style-type: none"> Evidence suggests that individuals of BAME background are at higher risk of developing severe complications of COVID-19. This also applies for pregnant women. We therefore advise that: <ul style="list-style-type: none"> Women of BAME background should be advised that they may be at higher risk of complications of COVID-19; and encouraged to seek advice without delay if they are concerned about their health. Clinicians should maintain face-to-face appointments with women when there are safeguarding concerns in order to provide extra support. It is recommended that women should continue to take folic acid and vitamin D supplements as per national recommendations. If women or their families express concerns about their mental health or 'red flag' symptoms such as suicidal thoughts or sudden mood changes they should be supported to access urgent care by healthcare providers signposting or referring appropriately.
II	24.7.20	<p>2.3: Amended advice:</p> <ul style="list-style-type: none"> Visitors to isolation rooms or ward cohort bays should be kept to a minimum and follow local hospital visitor policies.
II	24.7.20	<p>4.1: Amended advice:</p> <ul style="list-style-type: none"> For asymptomatic women who test positive for SARS-CoV-2 on admission, continuous electronic fetal monitoring (CEFM) during labour using cardiotocography (CTG) is not recommended solely for this reason, and should only be used if it is required for another reason (e.g. previous caesarean birth). <ul style="list-style-type: none"> Fetal monitoring options should be discussed with the woman, acknowledging the current uncertainties in the care of women who are asymptomatic with a positive test for SARS-CoV2.
II	24.7.20	<p>4.2: Additional advice:</p> <ul style="list-style-type: none"> There are no contraindications to performing a fetal blood sample or using fetal scalp electrodes. <p>Advice on waterbirths has been revised and moved to (new) section 4.6.</p>
II	24.7.20	<p>4.3: Amended advice:</p> <ul style="list-style-type: none"> Informed discussions with women about fetal monitoring should acknowledge that evidence of fetal distress is based on small numbers of babies born to women symptomatic of COVID-19 and theoretical risks extrapolated from pregnancies affected by fetal growth restriction in women with other coronaviruses.

Version	Date	Summary of changes
II	24.7.20	<p>4.4: Amended advice:</p> <ul style="list-style-type: none"> If birth partners are symptomatic or in a period of self-isolation for confirmed SARS-CoV-2 infection, they should remain in self-isolation at home and not attend the unit. <p>Advice removed: on birth partners being asked to remain by the woman's bedside and not to walk around the ward/hospital.</p>
II	24.7.20	<p>4.5: Amended advice:</p> <ul style="list-style-type: none"> Women and their families should be aware that donning PPE for emergency caesarean births is time-consuming but essential, and that this may impact on the time it takes to assist in the birth of the baby and potentially result in an adverse outcome. This should be taken into account during decision-making and ideally discussed during birth planning <p>Removed advice on the use of birthing pools in hospital for women with suspected or confirmed cases of COVID-19.</p> <p>Updated evidence about vertical transmission and data about donning PPE.</p>
II	24.7.20	4.6: New section on 'What are the considerations regarding waterbirth?'
II	24.7.20	<p>4.8: Amended advice:</p> <ul style="list-style-type: none"> Healthcare professionals are advised to follow national recommendations on the use of personal protective equipment in clinical settings.
II	24.7.20	4.10: New section 'What are the considerations for bereavement care during the COVID-19 pandemic?'
II	24.7.20	<p>5.1: Amended advice:</p> <ul style="list-style-type: none"> Women should be offered testing for COVID-19 if they meet the inpatient or community PHE criteria
II	24.7.20	<p>5.2: Updated advice:</p> <ul style="list-style-type: none"> A designated team member should be responsible for regularly updating the woman's family about her progress, utilising interpreting services where necessary. Thrombocytopenia is associated with severe COVID-19. For women with thrombocytopenia (platelets $<50 \times 10^9/L$) stop aspirin prophylaxis and thromboprophylaxis and seek haematology advice. Consider using mechanical aids (such as intermittent calf compressors) if thromboprophylaxis is paused secondary to thrombocytopenia Consider the use of antiviral medications, such as remdesivir, that have been shown to be potentially beneficial in COVID-19. If there is clinical uncertainty in whether to offer a therapy to a pregnant woman, seek advice through maternal medicine networks.

Version	Date	Summary of changes
II	24.7.20	<p>6.1: Added advice:</p> <ul style="list-style-type: none"> • Women with suspected or confirmed COVID-19 should be supported and enabled to remain together with their babies when the woman is well enough, and to practice skin-to-skin/kangaroo care, if the newborn baby does not require additional medical care at this time. • For a woman who has suspected or confirmed COVID-19 and whose baby needs to be cared for on the neonatal unit, a precautionary approach should be adopted to minimise any risk of women-to-infant transmission; at the same time, steps should be taken to involve parents in decisions, mitigating potential problems for the baby's health and well-being and for breastfeeding and attachment. • Women who have suspected, probable or confirmed COVID-19 should be enabled and supported to breastfeed, if this is what they choose.
II	24.7.20	<p>6.2: Title amended to: What should women and families be advised regarding infant feeding during the COVID-19 pandemic?</p> <p>Added advice</p> <ul style="list-style-type: none"> • Breastfeeding is recommended for all women and newborn infants. • Support, advice and guidance on breastfeeding should be provided to all women who choose to breastfeed • When a woman is not well enough to care for her own infant or where direct breastfeeding is not possible, she should be supported to express her breastmilk by hand expression or by pump, and/or be offered access to donor breast milk.
II	24.7.20	<p>6.3: Added advice:</p> <ul style="list-style-type: none"> • New mothers with COVID-19 still require all recommended advice, guidance and support in relation to their postnatal physical and mental health and wellbeing and care of their newborn. • Postnatal care should be provided as per national guidance. Face-to-face home or clinic appointments are required to provide physical checks and the offer of screening, including any wound examinations from caesarean births/assisted births, the newborn blood spot test and checking the weight of the baby. In some areas, and where appropriate, some postnatal care will need to be via virtual appointments using telephone or video link due to local infection rates and staff absence but considerations need to be made upon individual circumstances. This needs to be communicated to women and families.



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I. Purpose and scope

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This document is designed to provide guidance to healthcare professionals who care for pregnant women during the COVID-19 pandemic. It is designed to provide advice on how existing clinical guidelines can be implemented during this time, not to replace them.

The advice in this document is provided as a resource for UK healthcare professionals based on a combination of available evidence, good practice and expert consensus opinion. The priorities are:

- (i) The reduction of transmission of COVID-19 to pregnant women.
- (ii) The provision of safe, personalised and woman-centred care during pregnancy, birth and the early postnatal period during the COVID-19 pandemic.
- (iii) The provision of safe, personalised and woman-centred care to pregnant and postnatal women with suspected/confirmed COVID-19.

Please be aware that this is very much an evolving situation and this guidance is a living document that is being updated as new information becomes available. We therefore suggest that you visit this page regularly for current advice. This guidance will be kept under regular review as new evidence emerges. If you would like to suggest additional areas for this guidance to cover, any clarifications required or to submit new evidence for consideration, please email COVID-19@rcog.org.uk. Please note, we will not be able to give individual clinical advice or information for specific organisational requirements via this email address.

[Information for pregnant women and their families](#) is available in question and answer format, with accompanying videos in some cases, on the RCOG COVID-19 hub.

I.1 Identification and assessment of evidence

This guidance has been developed by a multidisciplinary group using the best available evidence retrieved by weekly literature reviews undertaken by a member of the RCOG Library team.

Due to the duration and rapidly evolving nature of the COVID-19 pandemic, there is a current lack of high-quality evidence. Using a conventional grading system for guideline development, such as SIGN, many of the studies would be classed as level 3 or 4 (non-analytical studies, e.g. case series/reports), with a few studies being classed as level 2 (systematic reviews of cohort studies). Much of the advice based on this evidence would therefore be graded D and in some cases, graded as good practice points based on expert opinion. Clinicians, women and their families are advised to be aware of the low-quality evidence on which the advice is given when using this guidance to assist decision making.

For a fuller description of the methods used to develop this guidance please see appendix 3.

I.2 Epidemiology

Novel coronavirus (SARS-CoV-2) is a new strain of coronavirus causing COVID-19, first identified in

Wuhan City, China towards the end of 2019.³ Other human coronavirus (HCoV) infections include HCoV 229E, NL63, OC43 and HKU1, which usually cause mild to moderate upper-respiratory tract illnesses, like the common cold, Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV).⁴

The World Health Organization (WHO) publishes a daily [international situation report](#) with an additional [Situation Dashboard](#) to provide information for individual countries. The [total number of confirmed cases](#) in the UK is published by the Department of Health and Social Care, and is available in a [visual dashboard](#).

For the most up-to-date advice please refer to health protection agency websites for [England](#), [Wales](#), [Scotland](#) and [Northern Ireland](#). Public Health England (PHE) and Public Health Scotland (PHS) have been cited throughout this document; specific guidance from the other areas of the UK will be updated as they become available. At the time of writing, Public Health Wales are aligning with PHE on case definitions, assessment, infection prevention and control (IPC) and testing. We will update the RCOG guidance if these change.

1.3 Transmission

Most global cases of COVID-19 have evidence of human-to-human transmission. This virus can be readily isolated from respiratory droplets or secretions, faeces and fomites (objects). Transmission of the virus is known to occur most often through close contact with an infected person (within 2 metres) or from contaminated surfaces.

Pregnant women do not appear more likely to contract the infection than the general population.^{5 6 7} Pregnancy itself alters the body's immune system and response to viral infections in general, which can occasionally cause more severe symptoms. This may be the same for COVID-19 but there is currently no evidence that pregnant women are more likely to be severely unwell, need admission to intensive care, or die from the illness than non-pregnant adults.⁸

With regard to vertical transmission (transmission from woman to her baby antenatally or intrapartum), evidence suggests that vertical transmission might be possible.⁹ Two reports have published evidence of immunoglobulin M (IgM) for SARS-CoV-2 in neonatal serum at birth.^{10 11} A recent report has demonstrated a high SARS-CoV-2 viral load in the placenta, associated with a maternal viraemia and followed by a neonatal infection, including neurological manifestations with inflammatory changes in the neonatal cerebrospinal fluid.¹⁴ In the interim report from the UK Obstetric Surveillance System (UKOSS), six babies (2.5%) had a positive nasopharyngeal swab within 12 hours of birth.¹⁵ In a systematic review of 24 pregnant women with COVID-19, there was no evidence of SARS-CoV-2 on polymerase chain reaction (PCR) testing of placenta, amniotic fluid, cord blood or breastmilk samples.¹⁶ In a larger systematic review of 666 neonates born to women with confirmed COVID-19, 28 out of 666 (4%) neonates had confirmed COVID-19 infection postnatally. On comparing mode of birth, eight out of 292 (2.7%) neonates were born vaginally and 20 out of 374 (5.3%) were born via caesarean birth. Seven were breast fed, three formula fed, one was given expressed breast milk and in 17 neonates the method of infant feeding was not reported, showing that neonatal COVID-19 infection is uncommon and the rate of infection is no greater when the baby is born vaginally, breastfed or stays with the woman after birth.¹⁷

Further investigation around vertical transmission is required and is underway.

1.4 Effect of COVID-19 on pregnant women

There is evolving evidence within the general population that there could be a cohort of asymptomatic individuals or those with very minor symptoms who are carrying the virus, although the prevalence is unknown. A prospective study of 675 pregnant women consecutively admitted to three New York City hospitals for birth, all tested for SARS-CoV-2, found 10% of women were positive for the virus; 79% of those infected women were asymptomatic for COVID-19.⁷

Most pregnant women will experience only mild or moderate cold/flu-like symptoms. Cough, fever, shortness of breath, headache and anosmia are other relevant symptoms.¹⁹ More severe symptoms which suggest pneumonia and marked hypoxia are widely described with COVID-19 in older people, the immunosuppressed and those with chronic conditions such as diabetes, cancer or chronic lung disease.²⁰ The symptoms of severe infection are no different in pregnant women and early identification and assessment for prompt supportive treatment is key.

Another cases series published by clinicians in New York, suggests possible patterns of disease in pregnant women. It describes 43 pregnant women who tested positive for SARS-CoV-2 and reported a similar pattern of disease severity to non-pregnant adults: 86% mild, 9% severe and 5% critical, although the sample size was too small to draw a definitive conclusion and no comparison was made for age, sex or co-morbidity-matched individuals.²¹

On 20 March 2020, UKOSS launched a registry for all women admitted to UK hospitals with confirmed COVID-19 in pregnancy. Further information can be found here. An interim report, was published on 08 June 2020.¹⁵ The UKOSS study is the largest published population-based cohort of pregnant women admitted to hospital with COVID-19 to date. At the time of the interim report, complete data were available for 427 pregnant women admitted to UK hospitals with confirmed SARS-CoV-2 infection between 1 March and 14 April 2020; this represents an admission rate of 4.9 (95% confidence interval [CI] 4.5–5.4) per 1,000 maternities. The women included in the report may have required admission to hospital for many reasons, including severe symptoms of COVID-19 or other obstetric indications (e.g. labour and birth) where COVID-19 was co-existent; it is not known what proportion of the admissions were because of COVID-19, rather than with COVID-19. Of the 427 pregnant women reported in the UKOSS study, 38 women (9%) required level-3 critical care; four women (<1%) received extracorporeal membrane oxygenation (ECMO). Five women included in the study died, suggesting a SARS-CoV-2-associated maternal mortality rate of 5.6 (95% CI 1.8–13.1) per 100,000 maternities compared to the overall maternal mortality rate in the UK of 9.2 per 100,000 from 2015–2017 data.²³ Whether these deaths are a direct result of COVID-19 infection is currently unclear. These data are expected to be updated in the future.

In data from the UKOSS study, most women were hospitalised in the third trimester or peripartum (n=342, 81%). The median gestational age at hospital admission was 34 completed weeks (interquartile range [IQR] 29–38). Of those admitted, 42% did not require iatrogenic birth of the baby; these women were discharged whilst still pregnant. Of those who did give birth during the data collection period, 59% had caesarean births; approximately half of these were because of maternal or fetal compromise. The remainder were for obstetric reasons (e.g. progress in labour, previous caesarean birth) or maternal request (6%). Of the women having a caesarean birth, 20% required general anaesthesia (GA) because of severe COVID-19 symptoms or urgency of birth.¹⁵

The UK Intensive Care National Audit and Research Centre (ICNARC) weekly report of the admissions to critical care with COVID-19, last updated on 17 July 2020, describing the first 10,492 admissions.⁸ Only 28 were currently pregnant and 39 recently pregnant (within the last 6 weeks).

There have also been case reports of women with severe COVID-19 infection at the time of birth who have required ventilation and ECMO,²⁴ and of maternal death.^{15 25-27} The overall numbers are small.

1.5 Risk factors for hospital admission with COVID-19 infection in pregnancy

Risk factors that appear to be associated with hospital admission with COVID-19 illness include:

1. Black, Asian or minority ethnicity (BAME)
2. Overweight or obesity
3. Pre-existing comorbidity
4. Maternal age >35 years

In the UKOSS study, the characteristics of women admitted to hospital with COVID-19 were compared with controls derived from a historical cohort of women giving birth between 1 November 2017 and 30 October 2018 (n=694). Pregnant women admitted to hospital with COVID-19 during the 2020 pandemic were more likely to be of black or other minority ethnicity (adjusted odds ratio [aOR] 4.49, 95% CI 3.37–6.00), have pre-existing comorbidity (aOR 1.52, 95% CI 1.12–2.06), be aged over 35 years (aOR 1.35, 95% CI 1.01–1.81) or be overweight (BMI of 25–29 kg/m²) or obese (BMI 30–39 kg/m²; aORs 1.91, 95% CI 1.37–2.68 and 2.20, 95% CI 1.56–3.10, respectively). This suggests that women with these risk factors were disproportionately represented in hospital admissions with or for COVID-19.¹⁵ Similar findings were reported in a large systematic review of 2,567 pregnancies with COVID-19, where 50.8% of women were from a BAME background. 38.2% of the women were obese and 32.5% had chronic comorbidities such as asthma and hypertension.²⁸ The association with BAME is particularly apparent and echoes previous findings that UK BAME pregnant women generally have worse outcomes in pregnancy and birth.²³

Furthermore, 13% of the UK's total population identifies as being from a BAME background, but 55% of all individuals admitted to UK critical care for COVID-19 illness are from BAME backgrounds and individuals from BAME backgrounds are more likely to die from COVID-19.^{8 23 29-31} In the case of COVID-19, it has been postulated that this association may be related to socioeconomic or genetic factors, or differences in response to infection; however, further research is needed.^{15 32} When assessing women with possible COVID-19 symptoms, it is important to consider their ethnicity during risk assessments, especially when they are from a BAME background.

It is estimated that vitamin D deficiency affects over 1 billion people worldwide. Vitamin D deficiency is associated with Acute Respiratory Distress Syndrome (ARDS) which is seen in COVID-19 infection.^{33 34} Women of BAME background with melanin pigmented skin are at increased risk of developing vitamin D deficiency. It is reported that as many as 94% of the South Asian population in the UK are diagnosed with vitamin D deficiency in the winter.³⁵ Recently, vitamin D supplementation has been suggested to be beneficial in reducing the risk of respiratory tract infections, although data are limited.³⁶ The current UK advice recommends vitamin D supplementation to all pregnant women and individuals of BAME background, regardless of the COVID-19 pandemic.³⁷

In addition to the UKOSS study, which showed that pregnant women with a BMI \geq 25 kg/m² were more likely to be admitted to hospital with COVID-19 than the historical controls, other studies

in non-pregnant populations have shown a similar trend of worse outcomes for individuals with BMI > 25 kg/m².¹⁵ The UK ICNARC weekly report found that 74% of those patients admitted were overweight or obese; 35% of admitted individuals had a BMI of 25–29 kg/m² (overweight), 31% a BMI of 30–39 kg/m² (obese) and 7.9% a BMI ≥ 40 kg/m².⁸ 2018 national data reported that 63% of the population were overweight or obese.³⁸

Pre-existing diabetes mellitus or gestational diabetes affects 5% of pregnant women in the UK, with the majority (88%) of women with diabetes in pregnancy affected by gestational diabetes.³⁹ In the UKOSS study, comorbidities such as diabetes were associated with pregnant women being admitted to hospital with COVID-19.¹⁵ In non-pregnant individuals, a UK study of 20,133 patients admitted to high dependency and intensive care with COVID-19 found uncomplicated diabetes was one of the most common comorbidities (21%, 3650/17599); a further 7% (n=1299) of individuals had complicated diabetes.⁴⁰

Lifestyle measures such as [regular exercise](#), a [healthy diet](#) and [vitamin D supplementation](#) are recommended in pregnancy and throughout life to prevent obesity, type 2 diabetes mellitus and vitamin D deficiency.

1.6 Effect of COVID-19 on the fetus

There are currently no data suggesting an increased risk of miscarriage in relation to COVID-19. Case reports from early pregnancy studies with SARS-CoV and MERS-CoV have not demonstrated a significant relationship between infection and increased risk of miscarriage or second trimester loss.⁴³

There is no evidence that fetal growth restriction (FGR) is a consequence of COVID-19; however, at present, this is considered possible as two-thirds of pregnancies with SARS were affected by FGR.^{44 45}

In the UKOSS cohort, the median gestational age at birth was 38 weeks (IQR 36–39 weeks). Of women who gave birth, 27% had preterm births: 47% of these were iatrogenic for maternal compromise and 15% were iatrogenic for fetal compromise, with 10% of term babies requiring admission to the neonatal unit. Six (2.5%) babies had a positive test for SARS-CoV-2 during the first 12 hours after birth; three of these were in babies born by pre-labour caesarean birth. One of these babies required admission to the neonatal unit. It was unclear from the report whether two perinatal deaths were related to co-existing maternal COVID-19.¹⁵

A review of 71 neonates born to women with COVID-19 in the third trimester reported that neonatal infection was diagnosed in 4 cases (5.6%) within 48 hours of birth by PCR tests of cord and neonatal blood samples.⁹



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2. Antenatal care during the COVID-19 pandemic

2 Antenatal care during the COVID-19 pandemic

2.1 What are the considerations for organisation of antenatal care?

Advice

- Women should be advised to continue their routine antenatal care, although it may be modified, unless they meet current self-isolation criteria for individuals or households with suspected or confirmed COVID-19.
- Service modifications are required to assist women practising social distancing measures, to reduce the risk of transmission between women, staff and other clinic/hospital visitors, and to provide care to women who are self-isolating for suspected/confirmed COVID-19 but for whom a hospital attendance is essential.
- Basic assessments such as blood pressure and urine testing are still required. Trusts and health boards should plan local strategies to ensure women are able to receive this monitoring.
- Units should employ teleconferencing and videoconferencing where possible and consider which appointments can be most appropriately conducted remotely, especially in areas of local lockdown, to minimise hospital attendance.
 - The limitations of virtual consultation methods should be recognised, including being aware that some women will not have sufficient internet access on their mobile devices or other computer hardware.
 - It should be acknowledged that virtual appointments, particularly by telephone, may cause new challenges in relationship-building between healthcare professionals and women, especially among vulnerable groups, women for whom English is not their first language or women who are hearing impaired.
 - Healthcare professionals should be aware that women may have additional queries regarding their care if they have less face-to-face contact.
- When in-person appointments are required (e.g. for blood tests, maternal examination or ultrasound scans), these should be arranged alongside other face-to-face maternity appointments to limit repeated clinic attendance.
- Particular consideration should be given to pregnant women who are 'shielding' or have been 'shielding'. Shared waiting areas should be avoided.
 - If women who are 'shielding' attend hospital, they should be isolated in single rooms.
- Women should be able to notify the unit regarding non-attendance due to self-isolation for COVID-19 using standard telephone numbers that are already available to them.
 - There should be a system in place to identify, support and follow up women who have missed appointments.

- o Units should appoint a named midwife or consultant to coordinate care for women unable to attend appointments due to self-isolation or a positive test. Missed appointments should be reviewed and either rescheduled if a face-to-face review is necessary or converted to a remote appointment.
- For women receiving antenatal care across different sites, units must ensure that there are clear pathways for communication via handheld notes, electronic records and correspondence to general practitioners.
- Clinicians should be aware of specific changes to services which have been suggested via regularly updated subspecialty service guidance available via the [RCOG website](#).

Summary of evidence and rationale for guidance

Maternity care is essential, and studies in the UK and internationally have shown that women who do not attend antenatal services are at increased risk of maternal death, stillbirth, and other adverse perinatal outcomes.^{46 47} A study comparing the incidence of stillbirths in a London hospital in the pre-pandemic and pandemic period, showed an increase in the stillbirth rate during the pandemic (n=16 [9.31 per 1000 births]) compared to pre-pandemic (n=4 [2.38 per 1000 births] P=0.01). None of the women had symptoms suggestive of COVID-19, nor did the placental examination or postmortem suggest SARS-CoV-2 infection.⁴⁸ Antenatal and postnatal care should be regarded as essential and women encouraged to attend, whilst observing current social distancing measures, as recommended by the [UK Government](#).⁴⁹

NHS England has [issued guidance](#) on the adoption of remote consultations in secondary care in order to minimise hospital visits.^{50 51}

The UK Government has published a list of conditions that make an [individual extremely vulnerable to the severe effects of COVID-19, along with guidance on how best to protect these individuals](#).⁴²

Data on how comparable telephone/video appointments are to face-to-face appointments are not available; until these are, we recommend clinicians follow locally agreed protocols for antenatal care provision.

The care of pregnant women with complex healthcare needs is challenging during a pandemic. To support clinicians caring for these women, guidance documents to assist maternity units with changes to services were developed; these can be found on the [RCOG website](#) and are updated regularly.

2.2 What are the considerations for antenatal appointments?

Advice

- Staff members should ensure adequate personal protective equipment (PPE) is used for face-to-face visits.

- Information and guidance should be available in languages spoken in the local communities served by the maternity unit.
- All women and any accompanying visitors (where permitted) should be advised to wear face masks or face coverings in line with [national guidance](#).
- [Evidence suggests that individuals of BAME](#) background are at higher risk of developing severe complications of COVID-19. This also applies for pregnant women. We therefore advise that:
 - Women of BAME background should be advised that they may be at higher risk of complications of COVID-19 and encouraged to seek advice without delay if they are concerned about their health.
 - Clinicians should be aware of this increased risk, and have a lower threshold to review, admit and consider multidisciplinary escalation of symptoms in women of BAME background.
 - When reorganising services, maternity units should be particularly cognisant of [evidence](#) that BAME individuals are at particular risk of developing severe and life-threatening COVID-19 disease.
 - Remote consultations should be encouraged where appropriate to minimise face-to-face contact, however traditional face-to-face appointments may be more effective, especially when interpreters are required.
- Women should be proactively advised to contact emergency antenatal services if they have any concern about their or their baby's wellbeing.
- Carbon monoxide testing of pregnant women has been paused during this period.
 - Midwives and doctors should still ask about, and document, smoking status at booking and at 36 weeks, provide brief advice and refer women who smoke to specialist stop-smoking support on an opt-out basis.
- It is recommended that women should continue to take folic acid and vitamin D supplements as per national recommendations.
- Pregnant women will continue to need at least as much support, advice, care and guidance in relation to pregnancy, childbirth and early parenthood as before the pandemic, especially women living with adversity (including poverty, homelessness, substance misuse, being an asylum seeker, experiencing domestic abuse and mental health problems).
 - Midwifery, obstetric and support staff should remain aware of the support needs for all women, acknowledging that trust-wide restrictions on hospital visitors are in place in most settings across the UK (including for women admitted to maternity services for antenatal and postnatal care) and may affect the amount of support that women require.
- Clinicians should be aware of the increased risk of domestic abuse in pregnancy, which has escalated during this pandemic. Women should be encouraged to share any concerns at every opportunity and be provided with advice on how to access support if required.

- Clinicians should maintain face-to-face appointments with women when there are safeguarding concerns, in order to provide extra support.
- Women should be asked about their mental health at every contact. Women who require further support should be signposted to resources and local services, which may be remotely provided, where possible. These include:
 - [Sources of self-help](#) for anxiety and stress.
 - When necessary, women in England can self-refer to local IAPT (Improving Access to Psychological Therapies) services. In Scotland, advice is available from [Parentclub](#) and [NHS Inform](#).
 - Further information is available from the [Royal College of Midwives \(RCM\)](#) and [RCPsych websites](#).
 - Women who express concern about their mental health or ‘red flag’ symptoms such as suicidal thoughts or sudden mood changes, or where their families express these concerns on their behalf, should be supported to access urgent care either through appropriate signposting or referral by their healthcare providers.

Summary of evidence and rationale for guidance

The appropriate use of PPE is an evolving area. We suggest that units follow the [regularly updated PHE guidance](#) on this in collaboration with their local guidance and infection control teams.⁵³ There are also clear guidelines on PPE from the [RCM](#).

The UK Government has issued guidelines on the use of face coverings within enclosed spaces in England, which apply to outpatient maternity appointments and hospital visitors.⁵⁴ We advise that these guidelines are followed. We will update if guidance relevant to the devolved nations becomes available.

Before this pandemic, there was already extensive evidence of the inequality of experience and outcomes for BAME women giving birth in the UK.^{29 30 55} The increased risk of COVID-19 among BAME people is likely to result from a number of factors such as socioeconomic disadvantage, and the fact that they are more likely to work in key-worker roles including health and social care. Women of BAME background are disproportionately affected by particular inherited and metabolic conditions, and may avoid or delay seeking advice from health care professionals when unwell.⁵⁶ They should be encouraged to contact health services earlier. BAME women who are living with socio-economic deprivation and/or in crowded conditions, those who were born outside the UK and whose first language is not English, and those with a high BMI and/or underlying medical conditions appear to be at particularly high risk.

There is currently an absence of accurate information about the additional risk of smoking and severe COVID-19 infection.⁵⁷ The risks of smoking during pregnancy are well-established. The National Centre for Smoking Cessation and Training (NCSCT) has recommended that carbon monoxide testing during pregnancy be paused. Although manufacturers of carbon monoxide monitors support their safety in relation to viruses, in order to minimise face-to-face reviews and avoid workforce pressures, a pause in carbon monoxide monitoring is appropriate. Recommendations on smoking

screening and cessation support are based on previous evidence on the effectiveness of these interventions. Further [guidance is available](#), including in [Appendix H of the Saving Babies' Lives Care Bundle for England](#).⁵⁸

This pandemic may result in an increased level of anxiety and other mental health problems in the general population.⁵⁹ There is increasing evidence that this is likely to be even greater for pregnant women as pregnancy represents a period of additional uncertainty.^{60 61} Specifically, these anxieties are likely to revolve around: a) COVID-19 itself, b) the impact of social isolation resulting in reduced support from wider family and friends, c) the potential of reduced household finances and d) major changes in antenatal and other NHS care, including some appointments being changed from face-to-face to telephone contact.⁶²

Isolation, bereavement, financial difficulties, insecurity and inability to access support systems are all widely recognised risk factors for mental ill-health and are expected to affect individuals more than usual during the pandemic.⁶⁰

[Recommendations on mental wellbeing](#) during the COVID-19 pandemic have been developed by the RCPsych and NHS England and NHS Improvement.

The coronavirus pandemic has increased the incidence of domestic abuse.^{63 64} Additional advice regarding support for victims of domestic abuse during the pandemic is [available here](#).

2.3 How should women with suspected or confirmed COVID-19 needing hospital attendance or advice be cared for?

Advice

For women who telephone maternity services:

- If women report symptoms attributed to COVID-19 on the phone to maternity services, consider differential diagnoses for fever, cough, change or loss of sense of smell/taste, or shortness of breath. This includes, but is not limited to urinary tract infection, chorioamnionitis and pulmonary embolism.
- If women have symptoms suggestive of COVID-19, they can self-refer to national services for SARS- CoV-2 [testing](#).

For women with possible or confirmed COVID-19, in whom hospital attendance is required or who self-present (this includes women who live with an individual who has possible or confirmed COVID-19):

- Women should be advised to attend via private transport where possible.
- If an ambulance is required, the call handler should be alerted if the woman, or a member of her household, is symptomatic of COVID-19.
- Women should be asked to alert a member of maternity staff by mobile telephone to their attendance when on the hospital premises, prior to entering the hospital or midwifery-led unit.

- Women should be met at the maternity unit entrance by staff wearing appropriate PPE, to provide a fluid-resistant surgical mask.
- Staff providing care should take PPE precautions as per national [health protection guidance](#).
- Women should immediately be escorted to an isolation room or cohort bay/ward, suitable for the majority of care during their hospital visit or stay.
 - Isolation rooms or ward bays should ideally have a defined area for staff to put on and remove PPE, and suitable bathroom facilities.
- The woman's face mask should not be removed until she is isolated in a suitable room or cohort bay.
- Only essential staff should enter the isolation room or bay.
- Visitors to isolation rooms or ward cohort bays should be kept to a minimum and follow local hospital visitor policies.
- All non-essential items from the isolation rooms should be removed prior to the woman's arrival (this includes other rooms in which the woman spends time during her hospital attendance [e.g. scan rooms when bedside scans are not appropriate]).
- All clinical areas must be cleaned following use, according to [current guidance](#).

Summary of evidence and rationale for guidance

Availability of resources, provision of services and local prevalence of COVID-19 will vary across geographical regions, and will determine how women requiring hospital admission with confirmed or suspected COVID-19 are cared for. Advice on care in isolation rooms and COVID-19 cohort bays is [available from PHE](#).⁵³ This advice may change frequently and we urge clinicians to stay abreast of the latest developments.

As above, we suggest that units follow the regularly updated [PHE guidance](#) on PPE, in conjunction with guidance from the [RCM](#) and their local guidance and infection control teams.^{53 66}

Guidance on cleaning clinical areas used to provide care to women with suspected or confirmed COVID-19 is available from PHE [health protection guidance](#).⁵³

2.4 What are the considerations for antenatal care for women who have recovered from COVID-19?

Advice

- For women who have recovered from COVID-19 with mild, moderate or no symptoms, without requiring admission to hospital, antenatal care should remain unchanged.
- Services should ensure that women who have missed antenatal appointments because of self-isolation are seen as early as is practical after the period of self-isolation ends.

- For women who have recovered from a period of serious or critical illness with COVID-19 requiring admission to hospital for supportive therapy, ongoing antenatal care should be planned together with a consultant obstetrician.
- Women who have been seriously or critically unwell should be offered a fetal growth scan approximately 14 days following recovery from their illness in the first instance, unless there is a pre-existing clinical reason for an earlier scan (e.g. fetal growth restriction [FGR]).

Summary of evidence and rationale for guidance

Currently, there is an absence of evidence to guide the care for women recovering from mild or moderate symptoms of COVID-19. Women who have recovered should be encouraged to attend antenatal appointments in line with advice statements outlined in Section 2.4.

Although there is no evidence yet that FGR is a consequence of COVID-19, two-thirds of reported pregnancies with SARS were affected by FGR, so ultrasound follow-up seems prudent.⁴⁴

Guidance on fetal growth surveillance following COVID-19 was developed along with the NHS England Saving Babies' Lives [modified Appendix G](#). This recommends a single fetal growth ultrasound scan a minimum of 14 days following resolution from acute illness of COVID-19 that required hospitalisation.



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3. Venous thromboembolism prevention

3 Venous thromboembolism prevention

3.1 How should prevention of venous thromboembolism be addressed during the COVID-19 pandemic?

Advice

- Women who are self-isolating at home should stay well hydrated and mobile throughout this period.
- Women should have a venous thromboembolism (VTE) risk assessment performed during their pregnancy as per the RCOG Green-top Guideline No 37a. Infection with SARS-CoV-2 should be considered as a transient risk factor and trigger reassessment.
- Women should continue with prescribed thromboprophylaxis.
- If women or healthcare professionals are concerned about the risk of VTE during a period of self-isolation, a clinical VTE risk assessment (in person or remotely) should be performed, and thromboprophylaxis considered and prescribed on a case-by-case basis.
- Local procedures should be followed in ensuring the supply of low molecular weight heparin (LMWH).
- Thromboprophylaxis commenced for pregnant women who are self-isolating should continue until they have recovered from the acute illness (between 7 and 14 days). For women with ongoing morbidity and limited mobility, advice from a clinician with expertise in VTE should be sought.
- All pregnant women admitted with confirmed or suspected COVID-19 should receive prophylactic LMWH, unless birth is expected within 12 hours.
- For women with severe complications of COVID-19, the appropriate dosing regimen of LMWH should be discussed in an MDT that includes a senior obstetrician or clinician with expertise in managing VTE in pregnancy.
- All pregnant women who have been hospitalised and have had confirmed COVID-19 should receive thromboprophylaxis for 10 days following hospital discharge. For women with persistent morbidity, consider a longer duration of thromboprophylaxis.
- If women are admitted with confirmed or suspected COVID-19 within 6 weeks postpartum, they should receive thromboprophylaxis for the duration of their admission and for at least 10 days post discharge. Consider extending this until 6 weeks postpartum for women with significant ongoing morbidity.

Summary of evidence and rationale for guidance

Pregnancy is widely recognised as a hypercoagulable state.⁶⁷ The existing RCOG Green-top Guidelines on VTE prevention and management should continue to support decision making during the COVID-19 pandemic.⁶⁸

There is emerging evidence suggesting that individuals admitted to hospital with COVID-19 are also hypercoagulable.^{69 70} Infection with SARS-CoV-2 is likely to be associated with an increased risk of maternal VTE. This is likely to be multifactorial, including the reduced mobility resulting from self-isolation at home or hospital admission, and other associated obstetric or maternal morbidity. Consequently, the cumulative risk is difficult to quantify.

The statements above were developed following expert consensus discussion to determine what increased risk COVID-19 may pose to pregnant women. VTE prevention for the unwell woman with COVID-19 is considered in section 5.2.



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4. Labour and birth during the COVID-19 pandemic

4 Labour and birth during the COVID-19 pandemic

4.1 What are the considerations for labour and birth in asymptomatic women who test or have tested positive for SARS-CoV-2?

Advice

- For low risk women who are asymptomatic and test-positive COVID-19 (within 7 days pre-birth) and wish to give birth at home or in a midwifery-led unit, it is recommended that an informed discussion around place of birth takes place with the midwife, consistent with local policies.
- For asymptomatic women who test positive for SARS-CoV-2 on admission, continuous electronic fetal monitoring (CEFM) during labour using cardiotocography (CTG) is not recommended solely for this reason, and should only be used if it is required for another reason (e.g. previous caesarean birth).
 - Fetal monitoring options should be discussed with the woman, acknowledging the current uncertainties in women who are asymptomatic with a positive test for SARS-CoV-2.

Summary of evidence and rationale for guidance

Whilst, some case series have reported fetal compromise in women who are symptomatic of COVID-19, the need for CEFM for women who are asymptomatic of COVID-19 and otherwise low risk for labour (e.g. CEFM would not otherwise be indicated by NICE guidance on Intrapartum Care) is an area of clinical uncertainty due to the lack of robust evidence.^{71 72} There is currently no evidence linking asymptomatic COVID-19 infection to abnormalities in continuous fetal monitoring or fetal compromise. While it is presently reassuring that there is no clear evidence of increased rates of fetal compromise in the asymptomatic population, women should continue to have the risks and benefits of CEFM discussed with them.

In the absence of other evidence, the current [NICE guidelines](#) on intrapartum care should be followed.⁷³

4.2 How should a woman with suspected/confirmed COVID-19 be cared for in labour if they are symptomatic?

Advice

- Women with mild COVID-19 symptoms can be encouraged to remain at home (self-

isolating) in early (latent phase) labour consistent with routine care. If women have symptoms suggestive of COVID-19, they can self-refer for [testing](#).

- If there are no concerns regarding the health of either the woman or baby, women who attend the maternity unit and would usually be advised to return home until labour is more established can still be advised to do so, unless private transport is not available.
 - Women should be given the usual advice regarding signs and symptoms of labour, but in addition should be informed about symptoms that might suggest deterioration related to COVID-19 and asked to call back if concerned.
- Advice on PPE is available in section 4.8.
- Women with symptomatic confirmed or suspected COVID-19 are recommended to labour and give birth in an obstetric unit.
- On admission, a full maternal and fetal assessment should be undertaken, including:
 - Assessment of the severity of COVID-19 symptoms by the most senior available clinician.
 - Maternal observations including temperature, respiratory rate and oxygen saturation.
 - Confirmation of the onset of labour, as per standard care.
 - CEFM using CTG.
- The following members of the MDT should be informed of the admission of the woman: consultant obstetrician, consultant anaesthetist, midwife-in-charge, consultant neonatologist and neonatal nurse in charge.
- Standard hourly maternal observations and assessment should be performed (as per the recommendations in the [NICE guideline on Intrapartum Care](#)), with the addition of hourly oxygen saturation monitoring. Oxygen therapy should be titrated to aim for saturation above 94%.
- Women with symptomatic confirmed or suspected COVID-19 should be offered CEFM during labour and vaginal birth.
- There are no contraindications to performing a fetal blood sample or using fetal scalp electrodes.
- Efforts should be made to minimise the number of staff members entering the room and units should develop a local policy specifying essential personnel for emergency scenarios.

Summary of evidence and rationale for guidance

NHS England has also produced clinical guidance on the [temporary reorganisation of intrapartum maternity care during the coronavirus pandemic](#).⁷⁴

PHE COVID-19 [infection and control guidance](#) gives advice about avoiding disease transmission.⁵³

[WHO](#) have produced guidance on clinical management of COVID-19.⁷⁵

In women with symptomatic COVID-19, there may be an increased risk of fetal compromise in active labour.^{71 72 76 77} Although the data in this area are poor, it appears prudent to use fetal monitoring for maternal systemic infection including COVID-19.

Many of the advice statements above are recommendations of good practice points derived from expert consensus.

Women have been advised to avoid water births due to the risk of disease transmission through faeces, although studies are in small numbers of women with possibly low viral loads in stool samples.^{78 79}

4.3 What are the considerations for labour and birth for women who have recovered from COVID-19?

Advice

- For women who have recovered from COVID-19, without requiring admission to hospital, and who have completed self-isolation in line with public health guidance, there should be no change to planned care during labour and birth.
- For women who have recovered following a hospital admission for serious or critical COVID-19 illness needing supportive therapy, place of birth should be discussed and planned with the woman, her family, if she wishes, and a consultant obstetrician. A personalised assessment should take into consideration fetal growth and the woman's choices.
- Informed discussions with women about fetal monitoring should acknowledge that evidence of fetal distress is based on small numbers of babies born to women symptomatic of COVID-19 and theoretical risks extrapolated from pregnancies affected by FGR in women with other coronaviruses.

Summary of evidence and rationale for guidance

There is an absence of evidence for this situation. The above is based on expert consensus.

4.4 What are the considerations for birth partners during the COVID-19 pandemic?

Advice

- Women should be supported and encouraged to have birth partners present with them

during active labour and birth if they wish to do so, unless the birth occurs under general anaesthetic (GA), in accordance with local or national hospital policies.

- If birth partners are symptomatic or in a period of self-isolation for confirmed SARS-CoV-2 infection, they should remain in [self-isolation](#) for confirmed SARS-CoV-2 infection, birth partners should remain in self-isolation at home and not attend the unit.
- On attendance at the maternity unit, all birth partners should also be asked whether they have had any symptoms suggestive of COVID-19 – e.g. fever, acute persistent cough, hoarseness, anosmia, nasal discharge/congestion, shortness of breath, sore throat, changes in or loss of sense of smell or taste, wheezing or sneezing, in the preceding 7 days.
 - If these symptoms began within 7 days or less, or they remain symptomatic (other than with a persistent cough), they should be asked to leave the maternity unit immediately and self-isolate at home.
 - Guidance about testing of women and their birth partners is discussed in the [RCOG document](#) 'Principles for the testing and triage of women seeking maternity care in hospital settings'.
- We recommend that asymptomatic birth partners are permitted to stay with the woman through labour and birth, unless the birth occurs under general anaesthetic (GA).
- Birth partners should be asked to remain by the woman's bedside and to not walk around the ward/hospital.
- Restrictions on other visitors should follow local hospital policy.

Summary of evidence and rationale for guidance

Having a trusted birth partner present throughout labour is known to make a significant difference to the safety and wellbeing of women in childbirth.⁸⁰⁻⁸²

General PHE guidance, local hospital infection control and visitor policies should be adhered to.^{50 83}

4.5 What informed discussions should take place with women regarding timing and mode of birth during the COVID-19 pandemic?

Advice

- Information regarding mode of birth during the COVID-19 pandemic should be discussed with the woman and her family, taking into consideration her preferences and any obstetric or fetal indications for intervention.
- Guidance on the offer of testing to all women attending maternity services is summarised in the [RCOG's 'Principles for the testing and triage of women seeking maternity care in hospital settings, during the COVID-19 pandemic'](#).
- A personal assessment should be made to determine whether it is beneficial overall

to delay elective caesarean birth or induction of labour (IOL), and any associated appointments, for women who are currently in a period of self-isolation because of suspected COVID-19 in themselves or a household contact.

- Personalised assessments to consider delaying elective birth for women in self-isolation should take into account the urgency of the birth and the risk of infectious transmission to other women, healthcare workers and, postnatally, to her baby.
- If a planned caesarean birth or IOL cannot be delayed, the advice for services providing care to women admitted when affected with suspected/confirmed COVID-19 should be followed.
- The use of birthing pools in hospital should be avoided in suspected or confirmed cases of COVID-19, given the potential risk of infection via faeces.
- In women with symptoms who are becoming exhausted or hypoxic, a personalised and informed discussion and decision should be made regarding shortening the length of the second stage of labour with instrumental birth.
- When urgent birth of the baby is required to aid supportive care of a woman with severe or critical COVID-19 and vaginal birth is not imminent, consider whether the benefits of an urgent caesarean birth may outweigh any risks to the woman.
- The advice in section 4.8 should be followed for PPE for caesarean birth.
- Women and their families should be aware that donning PPE for emergency caesarean births is time-consuming but essential, and that this may impact on the time it takes to assist in the birth of the baby and potentially result in adverse outcome. This should be taken into account during decision-making and ideally discussed during birth planning.

Summary of evidence and rationale for guidance

There is no evidence to favour one mode of birth over another in women with COVID-19. In the UKOSS study, 12(5%) babies tested positive for SARS-CoV-2 infection; six within the first 12 hours (two were born by unassisted vaginal birth and four by caesarean birth) and six after 12 hours (two born vaginally and four by caesarean birth).¹⁵ The rate of neonatal COVID-19 infection is no greater when the baby is born vaginally, breastfed or stays with the woman after birth.¹⁷ A single centre cohort study demonstrated a longer time to delivery in urgent caesarean sections for women with confirmed or suspected COVID-19, but in this small study the finding did not reach statistical significance.⁸⁵

4.6 What are the considerations for waterbirth?

Advice

- Waterbirth is not contraindicated for women who are asymptomatic of COVID-19 and

presumed or confirmed SARS-CoV-2 negative, providing adequate PPE can be worn by those providing care.

- For women who are symptomatic of COVID-19 with a cough, fever or feeling unwell, labour and birth in water is not recommended.
- For women who are asymptomatic of COVID-19 but test positive for SARS-CoV-2, there is inadequate evidence about the risk of transmission of the virus in water.
- Clinicians should be aware that the integrity of PPE, such as a facemask, can be compromised when it becomes wet.

Summary of evidence and rationale for guidance

Labour and birth in water may confer benefits to women at low risk of complications during birth.

Lack of evidence about the risks of transmission of the virus in water exists. There is evidence that COVID-19 RNA may be present in faeces but no evidence to support that this has resulted in faecal-oral spread. However, there is a small theoretical risk that water contaminated with faeces or other maternal secretions could pose an infection risk to the baby or the staff caring for a woman birthing in water. There is, therefore, insufficient evidence for or against the use of water in labour or birth for asymptomatic women and staff caring for them, and this risk also applies when caring for a woman during labour out of water. The RCOG and RCM have sought further guidance on this issue from national authorities and will update these recommendations as further information becomes available.

It is recommended that women with pyrexia should not labour or birth in water.⁷³ Women with a cough or breathing difficulties, or those who feel unwell, should be closely monitored for their oxygen saturations and other vital signs and may require oxygen support. This care is better provided on land to enable effective monitoring.

4.7 What are the specific considerations for labour analgesia or anaesthesia?

Advice

- Entonox can be used with a single-patient microbiological filter.
- In early labour, inform women with symptomatic or confirmed COVID-19 about the potential benefit of epidural analgesia. This may minimise the need for GA if urgent intervention for birth is needed, so that they can make informed decisions regarding use or type of labour analgesia.

Summary of evidence and rationale for guidance

Advice published on the considerations for [labour analgesia or anaesthesia](#) is based on expert opinion following consultation with the Obstetric Anaesthetists' Association (OAA).

There is no evidence that the use of Entonox is an [aerosol-generating procedure](#) (AGP).

There is no evidence that [epidural or spinal analgesia or anaesthesia](#) is contraindicated in the presence of coronaviruses.⁸⁶

Intubation, required for GA in the case of caesarean birth, is an [AGP](#). This significantly increases the risk of transmission of coronavirus to the attending staff.

4.8 What personal protective equipment is recommended when caring for women during labour and birth?

Advice

- Healthcare professionals are advised to follow national recommendations on the use of personal protective equipment in clinical settings.
- Due to the level of PPE required for caesarean birth, this requires a multidisciplinary discussion about the likelihood of a woman requiring a general anaesthetic.
- For the minority of caesarean births where GA is planned from the outset, all staff in theatre should wear PPE, including an FFP3 mask and visor. PPE should be donned prior to commencing the GA.
- Local standard operative procedures should be developed to determine the type of PPE required in cases of potential unsuccessful regional anaesthesia for caesarean birth.

Summary of evidence and rationale for guidance

General advice from PHE on type and specification of PPE is [available here](#).⁵³ Particular advice from PHE on type and specification of PPE for different maternity settings is available as part of the [table here](#).

The level of PPE required by healthcare professionals caring for a woman with COVID-19 who is undergoing a caesarean birth should be determined on the basis of the [risk of her requiring a GA](#). Intubation is an AGP. This significantly increases the risk of transmission of coronavirus to the attending staff.

Siting regional anaesthesia (spinal, epidural or combined spinal epidural [CSE]) is not an [AGP](#).

The chance of requiring conversion to a GA during a caesarean birth commenced under regional anaesthesia is small, but this chance increases with the urgency of caesarean birth. In situations where there are risk factors that make conversion to a GA more likely, the decision on what type of PPE to wear should be judged on the basis of the individual circumstances. If the risk of requiring conversion to a GA is considered significant (e.g. 'top-up' of a suboptimal epidural from labour), the theatre team should wear PPE appropriate to a GA in readiness.

4.9 How should obstetric theatres be managed during the COVID-19 pandemic?

Advice

- Elective obstetric procedures (e.g. cervical cerclage or caesarean birth) planned for women with suspected/confirmed COVID-19 should be scheduled at the end of the operating list.
- Emergency procedures for women with suspected/confirmed COVID-19 should be carried out in a second obstetric theatre, where available, allowing time for a full postoperative theatre clean as per national health protection guidance.
- The number of staff in the operating theatre should be kept to a minimum, and all must wear appropriate PPE.
- Anaesthetic care for women with suspected or confirmed COVID-19 should be with reference to guidance from Royal College of Anaesthetists/Obstetric Anaesthetists' Association.
- The use of PPE causes communication difficulties in obstetric theatres so checklists should be used with closed loop communication.⁷³

Summary of evidence and rationale for guidance

The statements above were developed on the basis of government advice [on IPC](#).⁵³

The guidance above is based on expert consensus and IPC advice.

4.10 What are the considerations for bereavement care during the COVID-19 pandemic?

Advice

- Maternity services should ensure that bereavement care remains of a high standard during the COVID-19 pandemic, with continued provision of appropriate intrapartum and postnatal care, including all appropriate investigations and postnatal appointments.

Summary of evidence and rationale for guidance

Maternity services may have modified bereavement services during the initial phased of the pandemic. Further guidance on bereavement care during the pandemic is available from the SANDS/RCM briefing '[Bereavement Care in Maternity Services During COVID-19 pandemic](#)'. SANDS have produced information for bereaved families about care during the pandemic, available [here](#).



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5. Managing clinical deterioration during the COVID-19 pandemic

5. Managing clinical deterioration during the COVID-19 pandemic

5.1 How should a woman requiring hospital admission with symptoms suggestive of COVID-19 be investigated?

Advice

- If the woman attends with a fever, investigate and treat as per [RCOG guidance on sepsis in pregnancy](#). Testing for COVID-19 should be arranged in addition to blood cultures.
- While pyrexia may suggest COVID-19, do not assume that all pyrexia is due to COVID-19. Consider the possibility of bacterial infection and perform full sepsis-six screening and administer intravenous antibiotics when appropriate.
- Consider bacterial infection if the white blood cell count is raised (lymphocytes usually normal or low with COVID-19) and commence antibiotics.
- Women should be offered testing for COVID-19 if they meet the inpatient or community [PHE criteria](#).
 - Current inpatient case criteria (correct as of 19 July 2020) are individuals who are being/are admitted to hospital with one of the following:
 - A loss of, or change in, normal sense of taste or smell (anosmia) in isolation or in combination with any other symptoms of COVID-19.
 - Clinical/radiological evidence of pneumonia.
 - Acute respiratory distress syndrome (ARDS).
 - Fever $\geq 37.8^{\circ}\text{C}$ AND at least one of the following: acute persistent cough, hoarseness, nasal discharge/congestion, shortness of breath, sore throat, wheezing or sneezing.
- Radiographic investigations should be performed as for the non-pregnant adult; this includes chest X-ray and computerised tomography (CT) of the chest.
 - Chest imaging, especially CT of the chest, is essential for the evaluation of the unwell woman with COVID-19 and should be performed when indicated, and not delayed because of concerns of possible fetal exposure to radiation, as maternal wellbeing is paramount.
- The diagnoses of pulmonary embolism and heart failure should be considered in women with chest pain, worsening hypoxia or a respiratory rate >22 breaths/min (particularly if there is a sudden increase in oxygen requirements), or in women whose breathlessness persists or worsens after expected recovery from COVID-19.
- Consider additional investigations to rule out differential diagnoses, e.g. electrocardiogram (ECG), CT pulmonary angiogram, echocardiogram, etc.

Summary of evidence and rationale for guidance

The clinical symptoms of COVID-19 overlap with those of a variety of other clinical conditions. We encourage clinicians to consider all differential diagnoses for women who present with a fever in pregnancy and follow the advice and guidance of the RCOG Green-top Guideline No. 64a.⁸⁸

The current PHE guidance on testing for suspected COVID-19 is [available here](#).¹⁹ This is a rapidly evolving area of policy and will likely have local variations on implementation. We recommend that clinicians liaise with their local infection control and testing teams. In addition, a [national framework](#) that applies to NHS Trusts in England at present recommends offering testing for SARS-CoV-2 to all hospital inpatients. [Specific guidance from the RCOG](#) has been developed that recommends how this framework may need to be modified for maternity services.

Several studies have shown decreased lymphocyte counts in the general population affected by COVID-19.⁸⁹ One systematic review noted decreased lymphocyte counts in 164 pregnant women.⁹⁰

5.2 How should a woman with suspected/confirmed COVID-19 who is clinically deteriorating be cared for?

Advice

- Obstetricians should be familiar with local protocols for the initial investigation and care of patients presenting to medical teams with possible COVID-19. These protocols should be followed for pregnant women as far as possible (including initial investigations, management of fluid balance and escalation of care to involve the critical care team).
- The priority for medical care should be to stabilise the woman's condition with standard therapies.
- Hourly observations should include respiratory rate and oxygen saturation, monitoring both the absolute values and trends.
- Signs of decompensation include an increase in oxygen requirements or $FiO_2 > 40\%$, a respiratory rate $>30/\text{min}$, reduction in urine output, or drowsiness, even if oxygen saturations are normal.
- Escalate urgently if any signs of decompensation develop.
 - Young, fit women can compensate for a deterioration in respiratory function and are able to maintain normal oxygen saturations until sudden decompensation.
 - Signs of decompensation include an increase in oxygen requirements, an increasing respiratory rate despite oxygen therapy, an acute kidney injury or drowsiness even if the saturations are normal.
- Titrate oxygen flow to maintain saturations $>94\%$.
- Apply caution with intravenous fluid management:

- Women with moderate-to-severe symptoms of COVID-19 should be monitored using hourly fluid input/output charts.
- Efforts should be targeted towards achieving neutral fluid balance in labour.
- Try boluses in volumes of 250–500 ml and then assess for fluid overload before proceeding with further fluid resuscitation.
- Have a low threshold to start antibiotics at presentation, with early review and rationalisation of antibiotics if COVID-19 is confirmed. Even when COVID-19 is confirmed, remain open to the possibility of another co-existing condition.
- Suspected COVID-19 should not delay administration of therapy that would usually be given (e.g. intravenous antibiotics in woman with fever and prolonged rupture of membranes).
- Until test results are available, a woman with suspected COVID-19 should be treated as though it is confirmed.
- An MDT planning meeting should be urgently arranged for any unwell woman with suspected/confirmed COVID-19. This should ideally involve a consultant physician, consultant obstetrician, midwife-in-charge, consultant neonatologist, consultant anaesthetist and intensivist responsible for obstetric care. The discussion should be shared with the woman and her family if she chooses. The following considerations should be included:
 - Key priorities for medical care of the woman and her baby, and her birth preferences.
 - Most appropriate location of care (e.g. intensive care unit, isolation room in infectious disease ward or other suitable isolation room) and lead specialty.
 - Concerns among the team regarding special considerations in pregnancy, particularly the health of the baby.
- There should be daily obstetric reviews for women who are not admitted to wards other than those on the maternity unit.
- A designated team member should be responsible for regularly updating the woman's family about her progress, utilising interpreting services where necessary.
- All pregnant women should have a VTE assessment and be prescribed prophylactic dose thromboprophylaxis, unless there is a suspicion of a VTE when therapeutic dose thromboprophylaxis should be administered.
- Thrombocytopenia is associated with severe COVID-19. For women with thrombocytopenia (platelets $<50 \times 10^9/L$) stop aspirin prophylaxis and thromboprophylaxis and seek haematology advice.
- Consider using mechanical aids (such as intermittent calf compressors) if thromboprophylaxis is paused secondary to thrombocytopenia.
- Be aware of possible myocardial injury, and that the symptoms are similar to those of

respiratory complications of COVID-19.

- Be aware of the interim government guidance based on the results of the RECOVERY trial, which states that steroid therapy should be considered for 10 days or to hospital discharge, whichever is sooner, for adults unwell with COVID-19 and requiring oxygen (in pregnant adults, use oral prednisolone 40 mg once a day or intravenous hydrocortisone 80 mg twice a day).
- Consider the use of antiviral medications, such as remdesivir, that have been shown to be potentially beneficial in COVID-19.
- If there is clinical uncertainty in whether to offer a therapy to a pregnant woman, seek advice through maternal medicine networks.
- The frequency and suitability of fetal heart rate monitoring should be considered on an individual basis, accounting for the gestational age and the maternal condition.
- An individualised assessment of the woman should be made by the MDT to decide whether emergency caesarean birth or IOL is indicated, either to assist efforts in maternal resuscitation or where there are serious concerns regarding the fetal condition.
 - Individual assessment should consider: the maternal condition (including changes in oxygen saturations, radiological changes and respiratory rate), the fetal condition, the potential for improvement or deterioration following iatrogenic birth, and the gestation. The priority must always be the wellbeing of the woman.
 - If urgent intervention for birth is indicated for fetal reasons, birth should be expedited as for normal obstetric indications, as long as the maternal condition is stable.
 - If maternal stabilisation is required before intervention for birth, this is the priority, as it is in other maternity emergencies (e.g. severe pre-eclampsia).
- Antenatal steroids for fetal lung maturation should be given when indicated by NICE guidance but urgent intervention for birth should not be delayed for their administration.
- Consider the administration of magnesium sulphate cover for fetal neuroprotection irrespective of steroid status, but do not delay to administer the magnesium sulphate if urgent birth is indicated.

Summary of evidence and rationale for guidance

A useful summary on supportive care for adults diagnosed with COVID-19 has been published by [WHO](#).⁹¹ Specific guidance on the management of patients with COVID-19 who are admitted to critical care has now been published by [NICE](#) and [SIGN](#).^{92 93}

In a retrospective observational study of 12 pregnant women with severe disease from COVID-19, nine needed respiratory support; eight of these women were delivered with maternal respiratory distress. Seven of those did not require intubation, with two of them having improved oxygenation within 2 hours postpartum, showing that birth did not worsen the respiratory status.⁹⁴

Severe COVID-19 may be associated with thrombocytopenia. When aspirin has been prescribed as prophylaxis for pre-eclampsia, it should be discontinued as this may increase the bleeding risk in thrombocytopenic patients.⁸⁵

Myocardial injury and its complications were observed in 9.5% of all patients who died in Italy up to 13 April 2020.⁹⁶ Early involvement of multidisciplinary colleagues to investigate for potential myocardial injury is essential if this is suspected.⁹⁷ Further details of investigation and management is available in the [NICE rapid guideline](#) on diagnosing myocardial injury in patients with suspected or confirmed COVID-19.⁹⁷

Antenatal corticosteroids are well established as being beneficial in threatened preterm labour, or if iatrogenic preterm birth is anticipated.⁹⁸ There is no evidence that steroids in the doses prescribed for fetal lung maturation cause any harm in the context of COVID-19.⁹⁹ Magnesium sulphate is recommended for fetal neuroprotection in preterm babies as per RCOG guidelines.¹⁰⁰

For non-specialist anaesthetists and physicians involved in the care of pregnant women with COVID-19 and other medical conditions, useful information is available from the RCOA guidelines on [Care of the Critically Ill Woman in Childbirth](#) and the Royal College of Physicians' [Acute Care toolkit 15: managing acute problems in pregnancy](#).^{101 102}

The interim results of the RECOVERY trial demonstrated a significant reduction in mortality for individuals with COVID-19 requiring oxygen who were given steroid therapy.¹⁰³ This has immediately been recommended for use in the NHS.¹⁰⁴ The RECOVERY trial protocol for pregnancy recommends prednisolone 40 mg orally once daily, and in women unable to take oral medicine, hydrocortisone 80 mg intravenously twice daily instead of dexamethasone treatment.¹⁰⁵ Remdesivir, an antiviral medication, has been shown to be associated with a reduction in time to clinical improvement in individuals with severe COVID-19.¹⁰⁷ Where these and other therapies are offered, they should also be offered to pregnant women.



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6. Postnatal care

6. Postnatal care

Routine postnatal care for women in accordance with [national guidelines](#) and the RCOG framework for [service modifications to antenatal and postnatal care](#) during the pandemic should be followed. As the current crisis abates, strategies will be needed to ensure that previous evidence-based services that have been put on hold or amended are reinstated.

6.1 How should neonatal care for the baby be provided during the COVID-19 pandemic?

Advice

- Women and their healthy babies, who do not otherwise require maternal critical care or neonatal care, should be kept together in the immediate postpartum period.
- Women with suspected or confirmed COVID-19 should be supported and enabled to remain together with their babies and to practice skin-to-skin/kangaroo care, if the newborn does not require additional medical care at this time.
- For a woman who has suspected or confirmed COVID-19 and whose baby needs to be cared for on the neonatal unit, a precautionary approach should be adopted to minimise any risk of women-to-infant transmission; at the same time, steps should be taken to involve parents in decisions, mitigating potential problems for the baby's health and well-being and for breastfeeding and attachment.
- Women who have suspected, probable or confirmed COVID-19 should be supported to breastfeed if they choose.
- A risk and benefits discussion with neonatologists and families is recommended to individualise care in babies who may be more susceptible.
- All babies born to SARS-CoV-2-positive women should be cared for as per [guidance from the Royal College of Paediatrics and Child Health \(RCPCH\)](#).
- Specific guidance on neonatal resuscitation during the COVID-19 pandemic is available from the [Resuscitation Council](#).

Summary of evidence and rationale for guidance

There are limited data to guide the neonatal care of babies of women who tested positive for SARS-CoV-2 in the third trimester.^{108 109}

The Royal College of Paediatrics and Child Health and the Royal College of Midwives have provided separate guidance on this topic.^{109 110}

6.2 What should women and families be advised regarding infant feeding during the COVID-19 pandemic?

Advice

- Breastfeeding is recommended for all women, where safe and feasible to do so.
- Support, advice and guidance to breastfeed should be provided to all women who wish to breastfeed.
- Families should be supported in their feeding choices and informed of the risks and benefits of feeding the baby in close proximity to individuals with suspected or confirmed COVID-19.
 - Families should be informed that infection with COVID-19 is not a contraindication to breastfeeding.
- When a woman is not well enough to care for her own infant or where direct breastfeeding is not possible, she should be supported to express her breastmilk by hand expression or by pump, and/or be offered access to donor breast milk.
- The following [RCPCCH](#) precautions should be taken to limit viral spread to the baby:
 - Considering asking someone who is well to feed the baby.
 - Wash hands before touching the baby, breast pump or bottles.
 - Avoid coughing or sneezing on the baby while feeding.
 - Consider wearing a face covering or fluid-resistant face mask while feeding or caring for the baby.
 - Babies should not wear masks or other face coverings, as they may risk suffocation.
- When women are expressing breastmilk in hospital, a dedicated breast pump should be used.
 - Where a breast pump is used, follow recommendations for pump cleaning after each use.
 - For babies who are bottle-fed with formula or expressed milk, strict adherence to [sterilisation guidelines](#) is recommended.

Summary of evidence and rationale for guidance

The long-term well established benefits of breastfeeding are highly likely to outweigh any potential risks of transmission of the virus through breastmilk.¹¹ It is reassuring that a recent systematic review found that, in 24 cases, breastmilk tested negative for COVID-19; however, given the small number of cases, this evidence should be interpreted with caution.¹⁶ The main risk of breastfeeding is the close

contact between the baby and the woman, who is likely to share infective respiratory droplets.

In light of the current evidence, we advise that the benefits of breastfeeding outweigh any potential risks of transmission of the virus through breastmilk.¹¹² This is a view supported by the [UNICEF Baby Friendly Initiative](#), which is widely implemented in the UK.¹¹³

Specific recommendations on minimising the risk of transmission when feeding the baby were developed with experts from RCPCH and RCM, and from their guidance.^{109 110}

Face coverings are not deemed appropriate for babies. The current government advice for using face coverings is directed towards adults in England.¹¹⁴

6.3 What are the considerations for postnatal care for women and babies following admission with COVID-19?

Advice

- All households are advised to self-isolate at home for 14 days after birth of a baby to a woman with current COVID-19.
- Usual advice about safe sleeping and a smoke-free environment should be emphasised, along with provision of clear advice about careful hand hygiene and infection control measures when caring for and feeding the baby.
- Families should be provided with guidance about how to identify signs of illness in their newborn or worsening of the woman's symptoms, and provided with appropriate contact details if they have concerns or questions about their baby's wellbeing.
- Women who have recently given birth who have tested positive for COVID-19 still require all recommended advice, guidance and support in relation to their postnatal physical and mental health and wellbeing and care of their newborn baby.

Postnatal care should be provided as per national guidance. Face-to-face home or clinic appointments are required to provide physical checks and the offer of screening, including any wound examinations from caesarean births/assisted births, the newborn blood spot test and checking the weight of the baby. In some areas, and where appropriate, some postnatal care will need to be via virtual appointments using telephone or video link due to local infection rates and staff absence but considerations need to be made upon individual circumstances. This needs to be communicated to women and families.

Summary of evidence and rationale for guidance

The RCPCH has published guidance on the neonatal care of babies born to women with COVID-19.¹¹⁰ The advice for households to isolate for 14 days after the birth of a baby born to a woman who is infected with SARS-CoV-2 is to ensure a full period of isolation in case of incubation of the virus in the baby. These advice statements have been extrapolated from the RCPCH guidance and expert consensus opinion.

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Appendix

Appendix I: Summary of previous updates

Version	Date	Summary of changes
2	12.3.20	1.2: At the time of writing, Public Health Wales are aligning with Public Health England on case definitions, assessment, infection prevention and control and testing. We will update this guidance if this changes.
2	13.3.20	2.2: Updated to reflect PHE and health protection advice as per 13.03.20, in particular to use online symptom checkers and to treat all individuals with symptoms as possibly having COVID-19.
2	13.3.20	3.2: Sentence on who to test updated to reflect advice to test women with symptoms suggestive of COVID-19 who require admission.
2	13.3.20	3.6.4 and 3.6.5: Updated to suggest considering delay of elective caesarean birth or induction for women with symptoms suggestive of COVID-19 as well as those with confirmed COVID-19.
2	13.3.20	3.8: Infant feeding modified from recommendation to wear a face mask to try and avoid coughing or sneezing on the baby, and consider wearing face mask where available.
2	13.3.20	4: New section added for antenatal care for pregnant women following self-isolation for symptoms suggestive of COVID-19.
2	13.3.20	5 (new). New section - Advice for pregnant healthcare professionals.
2	13.3.20	Appendix I: Flow chart amended to reflect modified PHE guidance.
2	13.3.20	References: 19: NHS Staff Council Statement on Covid-19 2020 [Available from: https://www.nhsemployers.org/-/media/Employers/Documents/Pay-and-reward/NHS-Staff-Council---Guidance-for-Covid-19-Feb-20.pdf?la=en&hash=70C909DA995280B9FAE4BF6AF291F4340890445C] accessed 12 March 2020.
3	17.3.20	2: Advice for Health Professionals to share with Pregnant Women updated to reflect current guidelines.
3	17.3.20	3: New section added on Advice for all midwifery and obstetric services.
3	17.3.20	4.1: General advice to services providing care to pregnant women updated to reflect advice from chief medical officer on 16/3/20.
3	14.3.20	4.1: Advice on cleaning ultrasound equipment added, and reference added.
3	17.3.20	4.5: Linked to new national guidance on the actions required when a COVID-19 case was not diagnosed on admission .
3	17.3.20	4.6.2: Recommendations added: There is evidence of household clustering and household co-infection. Asymptomatic birth partners should be treated as possibly infected and asked to wear a mask and wash their hands frequently. If symptomatic, birth partners should remain in isolation and not attend the unit. The use of birthing pools in hospital should be avoided in suspected or confirmed cases, given evidence of transmission in faeces and the inability to use adequate protection equipment for healthcare staff during water birth.

3	17.3.20	4.6.2: Advice about Entonox changed to There is no evidence that the use of Entonox is an aerosol-prone procedure Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.
3	17.3.20	4.6.4: Anaesthetic management for women with symptoms or confirmed COVID-19, which was previously in this guidance, has been removed and external links provided
3	17.3.20	4.7.1: Statement inserted 'Chest imaging, especially CT chest, is essential for the evaluation of the unwell patient with COVID-19 and should be performed when indicated and not delayed due to fetal concerns.'
3	17.3.20	Updated to reflect current public health guidance on self-isolation and social distancing.
3	17.3.20	4.7.1: Advice on neonatal management and testing has been removed. Please refer to RCPCH guidance .
3	17.3.20	6: Advice for healthcare professionals updated in line with Chief Medical Officer statement on Monday 16 March.
4	21.3.20	6: Section on 'Occupational health advice for employers and pregnant women during the COVID-19 pandemic' added, replacing the previous section 6 on 'Information for Healthcare Professionals'. Section includes specific recommendations for healthcare professionals.
4	21.3.20	1.3-1.4: Additional information added on the susceptibility of pregnant women to COVID-19 infection.
4	21.3.20	2: Additional information on social distancing for pregnant women added, particularly specifying stringent adherence to recommendations for women >28 weeks gestation.
4	21.3.20	4.7: New section added on specific recommendations for PPE during labour and birth.
4	21.3.20	1: Addition of information and links for the UKOSS reporting system.
4	21.3.20	All: General proofread and editorial changes.
4	21.3.20	6: Page 36 title changed to 'Occupational health advice for employers and pregnant women during the COVID-19 pandemic'.
4.1	26.3.20	Chapter 6: 'Occupational health advice for employees and pregnant women during the COVID-19 pandemic' has been removed from this general guidance on pregnancy and COVID-19 infection, and published as a separate document given the distinct audience for the occupational health advice.
4.1	26.3.20	4.7.3: On Personal Protective Equipment updated in line with NHS England guidance.

5	28.3.20	1.3: Section updated to include new evidence on possible vertical transmission.
5	28.3.20	2.2: Sentence added on the major new measures announced by government for pregnant women with co-existing significant congenital or acquired heart disease.
5	28.3.20	2.3: Section updated to emphasise the need to attend maternity care.
5	28.3.20	3: General advice for antenatal care extended to include considerations for vulnerable women. Section also added on general advice regarding intrapartum services.
5	28.3.20	3.1: Specific advice added regarding the cessation of carbon monoxide monitoring in pregnancy, following advice from the National Centre for Smoking Cessation and Training.
5	28.3.20	4: Scotland specific links to Health Protection Scotland removed after confirmation from the Scottish government that National links from gov.uk should be used.
5	28.3.20	4.3.6: Scotland specific links to Health Protection Scotland removed after confirmation from the Scottish government that National links from gov.uk should be used.
5	28.3.20	4.7.3 and 4.76: Advice on PPE considerations for caesarean birth and general advice for obstetric theatres moved to new section 'Specific peri-operative advice for pregnant women with suspected/confirmed COVID-19 requiring surgical intervention'.
5	28.3.20	4.8.1: Reference made to new guidance published by NICE on the management of patients with COVID-19 in critical care.
5	28.3.20	4.8.1: Additional recommendations made for the management of women admitted during pregnancy with suspected/confirmed COVID-19.
5	28.3.20	4.9.2: Section edited to make infant feeding recommendations to any caregiver; not just to the mother.
5	28.3.20	4.10: New section on 'Specific peri-operative advice for pregnant women with suspected/confirmed COVID-19 requiring surgical intervention'.
5	28.3.20	5.1: Correction of an error in the title to clarify that this section refers to the care of women recovering from suspected (not confirmed) COVID-19 for which hospitalisation was not required.
6	3.4.20	Throughout: References to the new RCOG guidance on (1) antenatal and postnatal services (2) antenatal screening (3) fetal medicine services (4) maternal medicine services and (5) self-monitoring of blood pressure, have been added throughout the document.
6	3.4.20	1.2: New resources signposted on current UK and international disease incidence.
6	3.4.20	1.4: Sentence reporting that there are 'no reported maternal deaths from COVID-19' removed because there was recently a possible maternal death reported in tabloid media. There is not any robust evidence to amend this statement or report confidently in the guideline.
6	3.4.20	3.2: Addition of new advice on screening birth partners for recent possible symptoms of COVID-19 when they attend the maternity unit. In addition, suggestion of information to give the birth partner about what is expected of them whilst they are in the hospital, to assist staff in reducing the risk of infection transmission and to assist with communication when birth partners accompany women into operating theatres.
6	3.4.20	3.4: Moved to section 3.2.
6	3.4.20	3.5: New section on maternal mental wellbeing during the pandemic.
6	3.4.20	4.1 The previous section 4.2 was repetitive of section 3.1 and so has been removed. Sections 4.2 onwards have been re-numbered.

6	3.4.20	4.3: Inclusion of the PHE case definition for COVID-19 testing, rather than referring readers to this through the link.
6	3.4.20	4.9: Updates to advice on PPE for caesarean birth, to ensure that these are consistent with new PHE advice.
7	9.4.20	1.4: Update to data from ICNARC and inclusion of a report of 43 pregnant women with COVID-19 from New York.
7	9.4.20	1.4: New comment on risk of venous thromboembolism from COVID-19.
7	9.4.20	2.3: Advice for pregnant women added – if they are advised to attend a face-to-face antenatal appointment, this is because the appointment is important and the benefit of attending is perceived to be greater than the possible risk of infection with COVID-19 caused by leaving home. Added also emphasised advice to contact maternity services if concerns during pregnancy.
7	9.4.20	3.1: New section of reducing the risk to women of new infection caused by attending maternity settings. All other subsections in section 3 have been re-numbered.
7	9.4.20	3.2: New comment on visitor restrictions in maternity settings.
7	9.4.20	3.2: List of risk factors which contribute to mental ill health in pregnant women, and acknowledgement of the risk of increasing domestic violence with policy for social distancing, moved to section 3.6 on maternal mental wellbeing.
7	9.4.20	3.3: Advice about induction of labour changed to reference update to Saving Babies' Lives Care Bundle.
7	9.4.20	4.2 Section 4.2 renamed 'Women with unconfirmed COVID-19 but symptoms suggestive of possible infection' to allow for inclusion of new recommendations on women who call the maternity unit with possible COVID-19 infection (not just attend in person).
7	9.4.20	4.2: Additional recommendations made to consider usual differential diagnoses in women who call the maternity unit to report a new fever/cough/respiratory symptoms.
7	9.4.20	4.3.1: New subsection added on the care of pregnant women who are self-isolating at home with suspected COVID-19.
7	9.4.20	4.4: Changed to subsection 4.3.3 (subsequent subsections re-numbered).
7	9.4.20	4.6.1: New recommendations re. prophylactic low molecular weight heparin to reduce risk of venous thromboembolism with COVID-19 infection in pregnancy, and to consider pulmonary embolism if women with COVID-19 suddenly deteriorate.
7	9.4.20	4.7.2: Statement on calling neonatal team early to inform them of imminent birth of a baby to a woman with COVID-19 moved to section 4.5, because it applies to all cases of COVID-19, not just in women with severe disease.

8	17.4.20	1: New paragraph on the quality of the available evidence and resultant classification of the advice.
8	17.4.20	1.4: New evidence included on the risk of COVID-19 in the woman, including a case series of pregnant women attending two maternity units in New York, who were screened for COVID-19 on arrival, the inclusion of the first report of maternal death directly attributed to COVID-19 in scientific literature and an update to the ICNARC data.
8	17.4.20	4.2, 4.5.2 & 4.6.2: Restructured, including some new subtitles to organise and break up the text.
8	17.4.20	4.3.1: Renamed 'risk of venous thromboembolism'.
8	17.4.20	4.6: Section restructured for clarity.
8	17.4.20	4.7 and 4.8: Re-ordered the two sections within the text so that considerations for birth are written before considerations for neonatal and postnatal care.
8	17.4.20	5.3: Section re-structured. Also includes clarification that the recommendation for 10 days postnatal LMWH is regardless of mode of birth.
8	17.4.20	Appendix 2: Table of previous updates moved to appendix 3.
8	17.4.20	Appendix 3: New information on considerations when caring for women with suspected/confirmed COVID-19 during labour and birth.
9	13.5.20	1: Aims updated to include: The provision of safe, woman-centred care to women who are pregnant, give birth or are in the early postnatal period during the COVID-19 pandemic.
9	13.5.20	1: Findings of UKOSS data included in the summaries on viral transmission, effects on the woman and effects on the fetus/neonate. Where this supersedes existing references because of higher quality research or larger numbers, it has been used to replace it.
9	13.5.20	1.3: Updated information on possibility of vertical transmission to state that there are serious limitations to the available evidence.
9	13.5.20	1.4: Updated with emerging evidence on increased risk from COVID-19 to individuals with black, Asian and minority ethnic (BAME) background.
9	13.5.20	2: Information to share with pregnant women and their families has been removed from the guidance. All this information is also available in the RCOG information for pregnant women and their families in the COVID-19 hub. All subsequent sections have been renumbered.
9	13.5.20	3.1 (Now 2.1): Added paragraph about reducing transmission between staff.
9	13.5.20	3.2 (Now 2.2): Statement and recommendations added: Emerging evidence suggests that individuals of black and minority ethnic (BAME) background may be at higher risk of developing severe complications of COVID-19. This may equally apply to pregnant women. We therefore advise: <ul style="list-style-type: none"> • Women of BAME background should be opportunistically advised that they may be at higher risk of complications of COVID-19, and advised to seek help early if they are concerned about their health. • Clinicians should be aware of this increased risk, and have a lower threshold to review, admit and consider multidisciplinary escalation in women of BAME background.

9	13.5.20	2.2: Removed statement that further guidance on remote consultations will be published soon, and provided reference to RCM/RCOG guidance on antenatal and postnatal care.
9	13.5.20	2.3: Changed the statement that units should consider reducing provision of induction of labour for indications that are not 'strictly necessary', to units should consider reducing induction of labour where this is not 'medically indicated'.
9	13.5.20	3.3 (Now 2.3): Reference to NHS England 'Clinical guide for the temporary reorganisation of intrapartum maternity care during the coronavirus pandemic' added.
9	13.5.20	3.3 (Now 2.3): Statement added: 'Care should be taken to maintain safe services which continue to offer women support and choice as far as possible at this time. In particular, women should continue to be encouraged to contact their maternity unit with concerns about their or their baby's wellbeing. Justification should be provided for any service rationalisation required.'
9	13.5.20	3.3 (Now 2.3): Statement added: 'When reorganising services, maternity units should be particularly cognisant of emerging evidence that black, Asian and minority ethnic group (BAME) individuals are at particular risk of developing severe and life-threatening COVID-19. There is already extensive evidence on the inequality of experience and outcomes for BAME women during pregnancy and birth in the UK. Particular consideration should be given to the experience of women of BAME background and of lower socioeconomic status, when evaluating the potential or actual impact of any service change.'
9	13.5.20	4.6 (Now 3.6): Recommendation to be aware that myocardial injury is common among individuals with COVID-19, and reference added to NICE Guidance on diagnosis of myocardial injury in patients with suspected or confirmed COVID-19 .
9	13.5.20	4.8.1 (Now 3.8.1): Reference added to Resuscitation Council guidance on neonatal life support during the COVID-19 pandemic.
9	13.5.20	4.5.2 (Now 3.5.2): Care in labour: Risk of venous thromboembolism. Clarification added that all women with suspected or confirmed COVID-19 should be discharged with 10 days' supply of prophylactic LMWH.
9	13.5.20	4.4 (Now 3.4): Women who develop new symptoms of COVID-19 during admission: Statement added that prophylaxis for venous thromboembolism should be considered and prescribed unless contraindicated.
9	13.5.20	4.6 (Now 3.6): Title change from 'Additional considerations in women with moderate/severe symptoms' to 'Women with suspected or confirmed COVID-19 and moderate/severe symptoms', to reflect that this includes information relevant to pregnant women admitted with COVID-19 outside of obstetric services.
9	13.5.20	4.6 (Now 3.6): Recommendation added: 'Prophylaxis for venous thromboembolism should be prescribed during admission unless contraindicated. At the time of discharge from hospital following a period of care for confirmed COVID-19 infection, all women should be prescribed at least 10 days of prophylactic LMWH.' This is consistent with recommendations already made elsewhere in previous versions of this document.
9	13.5.20	4.6 (Now 3.6): Changed statement 'Consider bacterial infection if the white blood cell count is raised (lymphocytes usually normal or low with COVID-19) and commence antibiotics' to 'Bacterial infection is an important differential diagnosis to COVID-19 infection. We advise blood cultures and a low threshold for antibiotics at presentation, with early review and rationalisation of antibiotics if COVID-19 is confirmed.'
9	13.5.20	3.6: Statement added: 'A woman with moderate or severe COVID symptoms who happens to be pregnant but with no immediate pregnancy issue should be cared for by the same multidisciplinary team as a non-pregnant woman with additional input from the maternity team. The labour ward should not be the default location for all pregnant women.'

Summary of updates - Version 10

The following Version 10 summary of changes includes an additional column to reflect significant restructure changes between version 9 and 10 of this guidance.

Date	Summary of changes		
	Summary of changes	Section content from v9	Location in v10 update
4.6.20	Introduction		Now incorporates the following sections from v9: <ul style="list-style-type: none"> • Purpose and scope • Identification and assessment of evidence • Epidemiology • Transmission • Effect of COVID-19 on pregnant women • Risk factors for hospital admission with COVID-19 • Effect of COVID-19 on the fetus
4.6.20	Antenatal care during the COVID-19 pandemic	2.2. General advice regarding the continued provision of antenatal and postnatal services	2.1 What are the considerations for organisation of antenatal care during the COVID-19 pandemic?
4.6.20	Antenatal care during the COVID-19 pandemic	2.3 General advice regarding possible service modifications during COVID-19	2.2 What are the considerations for antenatal appointments?
4.6.20	Antenatal care during the COVID-19 pandemic	2.6 Smoking cessation and carbon monoxide monitoring in pregnancy	2.3 What are the considerations for antenatal appointments?
4.6.20	Antenatal care during the COVID-19 pandemic	2.5 Maternal mental wellbeing	2.2 What are the considerations for antenatal appointments?
4.6.20	Antenatal care during the COVID-19 pandemic	3.1 General advice for services providing care to pregnant women with suspected or confirmed COVID-19, where hospital attendance is necessary	2.3 How should women with suspected or confirmed COVID-19 needing hospital attendance or advice be cared for?

4.6.20	Antenatal care during the COVID-19 pandemic	3.2 Women with unconfirmed COVID-19 but symptoms suggestive of possible infection	2.3 How should women with suspected or confirmed COVID-19 needing hospital attendance or advice be cared for?
4.6.20	Antenatal care during the COVID-19 pandemic	3.3.3 Attendance for unscheduled/urgent antenatal care in women with suspected or confirmed COVID-19	2.3 How should women with suspected or confirmed COVID-19 needing hospital attendance or advice be cared for?
4.6.20	Antenatal care during the COVID-19 pandemic	4.1 Antenatal care for pregnant women following self-isolation for symptoms suggestive of COVID-19	2.4 What are the considerations for antenatal care for women who have recovered from COVID-19?
4.6.20	Antenatal care during the COVID-19 pandemic	4.2 Antenatal care for pregnant women following hospitalisation for confirmed COVID-19 illness	2.4 What are the considerations for antenatal care for women who have recovered from COVID-19?
4.6.20	Venous thromboembolism prevention	3.3.1 Risk of venous-thromboembolism	3.1 How should prevention of venous thromboembolism during the COVID-19 pandemic be addressed?
4.6.20	Venous thromboembolism prevention	3.4 Women who develop new symptoms of COVID-19 during admission (antenatal, intrapartum or postnatal) Sentence on thromboprophylaxis	3.1 How should prevention of venous thromboembolism during the COVID-19 pandemic be addressed?
4.6.20	Labour and birth	2.4 General advice regarding intrapartum services	4.4 What about birth partners during the COVID-19 pandemic?
4.6.20	Labour and birth	Not in version 9	New section in version 10: 4.1 What are the considerations for labour and birth in asymptomatic women who test or have tested positive for SARS-CoV-2?

4.6.20	Labour and birth	3.5 Women attending for intrapartum care with suspected or confirmed COVID-19	4.2 How should a woman with suspected/confirmed COVID-19 be looked after in labour if they are symptomatic? 4.5 What informed discussions should take place with women regarding timing and mode of birth during the COVID-19 pandemic? 4.6 What are the specific considerations for labour analgesia or anaesthesia?
4.6.20	Labour and birth	3.7 Specific peri-operative advice for healthcare professionals caring for pregnant women with suspected/confirmed COVID-19 who require surgical intervention	4.8 How should obstetric theatres be managed during the COVID-19 pandemic? 4.7 What personal protective equipment is recommended when caring for women during labour and birth?
4.6.20	Postnatal	3.8 Neonatal care	6.1 How should neonatal care for the baby be provided during the COVID-19 pandemic? 6.2 What should parents/carers be advised regarding infant feeding during the COVID-19 pandemic?
4.6.20	Postnatal	4.3 Postnatal care for pregnant women immediately following hospitalisation for confirmed COVID-19 illness	6.3 What are the considerations for postnatal care for women and babies following admission with COVID-19?
10.1	19.6.20	1.1: Removal of 'MERS, Middle East Respiratory Syndrome' from the literature search strategy since it has not resulted in any new references since the first search.	
10.1	19.6.20	1.4: UKOSS reference changed to the published article in <i>The BMJ</i> .	
10.1	19.6.20	2.2: Advice on face masks changed to reflect national guidance from NHS England.	
10.1	19.6.20	4.4: Advice on number of visitors and/or birth partners for hospital inpatients changed to reflect national guidance from NHS England.	
10.1	19.6.20	5.2: Advice for women who are clinically deteriorating modified to include government recommendations based on the interim results of the RECOVERY trial.	
10.1	19.6.20	6.2: Specified that babies should not be advised to wear face masks because of the risk of suffocation.	

Appendix 2: Key considerations when caring for women with suspected/confirmed COVID-19 during labour and birth

Consideration:	
Setting for birth	If homebirth or birth in a midwifery-led unit is planned, a discussion should be initiated with the woman regarding the potentially increased risk of fetal compromise in active phase of labour if symptomatic with SARS-CoV-2. ⁶⁰ Attending an obstetric unit, where the baby can be monitored using continuous electronic fetal monitoring (EFM), should be recommended for birth.
Timing for birth	<p>A positive COVID-19 result in an otherwise well woman, when there is also no evidence of fetal compromise, is not an indication to expedite birth.</p> <p>Induction of labour (IOL) is associated with longer periods of inpatient stay than for spontaneous onset of labour.</p> <p>Review the indication for IOL and consider whether the likely benefits outweigh possible risks. Where possible, review the provision and possibility of outpatient IOL.</p> <p>For women who are currently in a period of self-isolation because of suspected COVID-19 in themselves or a household contact, an individual assessment should be made to determine whether it is safe to delay scheduled appointments for pre-operative care and elective caesarean birth, or IOL if planned to occur during their period of self-isolation.</p> <p>The individualised assessment should consider the urgency of the birth, and the risk of infectious transmission to other women, healthcare workers and, postnatally, to her baby.</p>
Mode for birth	<p>There is currently no evidence to favour one mode of birth over another in women who are SARS-CoV-2 positive, so mode of birth should be discussed with the woman, taking into consideration her preferences and any obstetric indications for intervention.</p> <p>Mode of birth should not be influenced by the presence of COVID-19, unless the woman's respiratory condition demands urgent intervention for birth.</p> <p>Waterbirth is not contraindicated for women who are asymptomatic of COVID-19 and presumed or confirmed SARS-CoV-2 negative, providing adequate PPE can be worn by those providing care. For women who are symptomatic of COVID-19 with a cough, fever or feeling unwell, labour and birth in water is not recommended.</p> <p>For women who are asymptomatic of COVID-19 but test positive for SARS-CoV-2, there is inadequate evidence about the risk of transmission. Advice should be sought from Infection Prevention and Control authorities.</p> <p>An individualised informed discussion and decision should be made regarding shortening the length of the second stage of labour with instrumental birth in a symptomatic woman who is becoming exhausted or hypoxic.</p> <p>In case of deterioration in the woman's symptoms, an individual assessment should be made regarding the risks and benefits of continuing the labour versus proceeding to emergency caesarean birth, if this is likely to assist efforts to resuscitate the woman.</p> <p>Donning PPE is time-consuming. For emergency caesarean births, this may impact on the decision to delivery interval but it must be done. Women and their families should be told early about this possible delay.</p>

Birth partners	<p>Women should be supported and encouraged to have a birth partner present with them during their labour and birth. Having a trusted birth partner present throughout labour and birth is known to make a significant difference to the safety and wellbeing of women in childbirth.</p> <p>At a minimum, one asymptomatic birth partner should be permitted to stay with the woman through labour and birth, unless the birth occurs under general anaesthetic.</p> <p>When a woman contacts the maternity unit in early labour, she should be asked whether she or her birth partner have had any symptoms which could suggest COVID-19 in the preceding 7 days. If her partner has had onset of symptoms in the last 7 days, the woman should be advised that her partner should not attend the unit with her and she should consider bringing another birth partner who is symptom-free. Explain the need to protect maternity staff and other women and families from the risk of infection.</p> <p>On attendance to the maternity unit, all birth partners should also be asked whether they have had any symptoms which could suggest COVID-19 in the preceding 7 days. If the onset of these symptoms was within the last 7 days, or symptoms are still present (other than persistent cough), they should be asked to leave the maternity unit immediately and self-isolate at home.</p> <p>Birth partners should be asked to remain by the woman's bedside, to not walk around the ward/hospital and to wash their hands frequently.</p> <p>We recommend that birth partners be given clear advance guidance on what is expected of them should they need to accompany the woman to the operating theatre – e.g. for caesarean birth. This is particularly important given the challenges of staff communication when wearing full PPE.</p> <p>Restrictions on other visitors should follow hospital policy.</p>
Respect and consent	<p>Women must still be able to make decisions about the care they receive in line with the principles of informed consent</p>
Fetal surveillance	<p>Discuss with women the options for fetal surveillance in labour in accordance with existing NICE guidelines.</p> <p>Recommend continuous EFM for women who are symptomatic of COVID-19.</p> <p>Current infection with SARS-CoV-2 is not a contraindication for application of a fetal scalp electrode or for fetal blood sampling.</p>
Pain relief	<p>There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses.</p> <p>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.</p> <p>Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.</p> <p>There is no evidence that the use of Entonox is an aerosol-generating procedure (AGP).</p>

<p>Pain relief</p>	<p>When a woman with confirmed or suspected COVID-19 is admitted to the maternity suite, the following members of the MDT should be informed: consultant obstetrician, consultant anaesthetist, midwife-in-charge, consultant neonatologist, neonatal nurse in charge and infection control team.</p> <p>Maternal observations and assessment should be continued as per standard practice, with the addition of hourly oxygen saturations.</p> <p>Aim to keep oxygen saturation more than 94%, titrating oxygen therapy accordingly.</p> <p>If the woman develops a fever; investigate and treat as per RCOG guidance on sepsis in pregnancy, but also consider active COVID-19 as a cause of sepsis and investigate according to PHE guidance.</p> <p>Apply caution with IV fluid management. Given the association of COVID-19 with acute respiratory distress syndrome, women with moderate to severe symptoms of COVID-19 should be monitored using hourly fluid input/output charts.</p> <p>Efforts should be targeted towards achieving neutral fluid balance in labour; in order to avoid the risk of fluid overload.</p>
<p>Infection control</p>	<p>Particular advice from Public Health England on type and specification of PPE for different maternity settings is available as part of the table here.</p> <p>All clinical areas used must be cleaned after use, as per health protection guidance.</p>

Appendix 3: Full description of guidance development methods

The development methods have evolved over the lifetime of this guidance. This version of the guidance was developed by a multidisciplinary group of authors listed in acknowledgments. Specific sections of the guidance were contributed by subject experts also listed in acknowledgments.

Weekly literature reviews are generated using the following search terms, MESH headings and associated synonyms: pregnancy, coronavirus, SARS, severe acute respiratory syndrome, infant, newborn and breast feeding. The search results are published weekly on the RCOG website. Populations of interest include pregnant women, those recently given birth, partners, neonates. Studies of other populations are included where necessary, in order to understand population risk, asymptomatic carriage of coronavirus and antibody results where we believe these findings can be extrapolated to the pregnant women. The retrieved evidence is reviewed by clinically trained members of the guidance team for inclusion. The criteria for including evidence has evolved, as the evidence base has matured. For each section of the guidance, the best available evidence is included. The guidance also includes reference to the 'grey' literature such as registry studies, reports from national organisations and non-peer reviewed content. Where there is a need to change practice and where published alternatives are not available, 'preprints' are discussed within the core guidance team and considered for inclusion.

For this guidance, good practice points are based on expert consensus of the multi-disciplinary guidance group comprising clinicians across a variety of disciplines reviewing the available evidence and on their own expertise and experience within clinical practice. Appreciating the paucity of high quality evidence in this area, this guidance is reviewed regularly to ensure the advice remains up to date and relevant.

While this document has not been subject to an open peer review or formal stakeholder consultation process, specific individuals and groups were asked to review its content prior to publication. These are listed in acknowledgments and include a wide range of external stakeholders including lay representatives, other Royal Colleges and professional Associations and representatives from the governments across England and the devolved nations. We also consider feedback on this guidance sent to the dedicated COVID-19 inbox.

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Royal College of
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