Coronavirus (COVID-19) Infection in Pregnancy

Information for healthcare professionals

Version 8: Published Friday 17 April 2020

Contents

Summary of updates	**3**
1. Introduction	**4-8**
2. Advice for health professionals to share with pregnant women	**9-12**
3. Advice for all midwifery and obstetric services caring for pregnant women	**13-19**
4. Advice for services caring for women with suspected or confirmed COVID-19	**20-35**
5. Advice for services caring for women following recovery from confirmed COVID-19	**36-38**
Acknowledgements	**39**
Appendix 1: Flow chart to assess COVID-19 risk in maternity unit attendees	**40**
Appendix 2: Appendix 2: Key considerations when caring for women with suspected/confirmed COVID-19 during labour and birth	**41-47**
Appendix 3: Previous updates	**48-55**
References	**56-60**

Summary of updates

Previous updates have been summarised in Appendix 2. New updates for this version of the guideline are summarised here.

Version	Date	Summary of changes
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

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1. Introduction

1. Introduction

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

(i) The reduction of transmission of COVID-19 to pregnant women.

(ii) The provision of safe care to pregnant 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.

SARS-CoV-2 is a new coronavirus, and therefore the evidence currently available to guide clinical management in this specific situation is of low quality. 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 and expert opinion).[1] The advice based on this evidence would therefore be graded D, and in some cases, graded as good practice points. Clinicians and patients are advised to be aware of the low quality evidence on which the advice is made, when using this guidance to assist decision-making. We are currently updating this guidance weekly in line with newly available evidence.

On Friday 20 March 2020, the UK Obstetric Surveillance System (UKOSS) launched a registry for all women admitted to UK hospitals with confirmed COVID-19 infection in pregnancy. Further information can be found here.

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.

1.1 The virus

Novel coronavirus (SARS-COV-2) is a new strain of coronavirus causing COVID-19, first identified in Wuhan City, China. 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).

1.2 Epidemiology

The virus appears to have originated in Hubei province in China towards the end of 2019. Within Europe, Italy and Spain are the countries currently most affected. The World Health Organization (WHO) publishes a daily international situation report with an additional Situation Dashboard illustrating information by 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.

This situation however is changing rapidly. For the most up-to-date advice please consult local health protection agencies. Health protection in the United Kingdom is a devolved matter and links to local guidance are available 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 and testing. We will update the RCOG guidance if this changes.

1.3 Transmission

Most cases of COVID-19 globally have evidence of human to human transmission. This virus can be readily isolated from respiratory secretions, faeces and fomites. There are two routes by which COVID-19 can be spread. The first is directly through close contact with an infected person (within 2 metres) where respiratory secretions can enter the eyes, mouth, nose or airways. This risk increases the longer someone has close contact with an infected person who has symptoms. The second route is indirectly via the touching of a surface, object or the hand of an infected person contaminated with respiratory secretions and subsequently touching one's own mouth, nose or eyes. Healthcare providers are recommended to employ strict infection prevention and control (IPC) measures, as per local Health Protection guidance.

Pregnant women do not appear more likely to contract the infection than the general population. Pregnancy itself alters the body's immune system and response to viral infections in general, which can occasionally cause more severe symptoms. This will be the same for COVID-19.

With regard to vertical transmission (transmission from woman to her baby antenatally or intrapartum), emerging evidence now suggests that vertical transmission is probable, although the proportion of pregnancies affected and the significance to the neonate has yet to be determined. Two reports have published evidence of IgM for SARS-COV-2 in neonatal serum at birth.[2,3] Since IgM does not cross the placenta, this is likely to

represent a neonatal immune response to in utero infection. Previous case reports from China suggested that there was no evidence for this and amniotic fluid, cord blood, neonatal throat swabs, placenta swabs, genital fluid and breastmilk samples from COVID-19 infected women and their babies have so far all tested negative for the virus.[4-7]

The evidence above is all based on small numbers of cases. The situation may change and we will continue to monitor outcomes. MBRRACE-UK have recently commenced centralised, real-time monitoring of affected women admitted to hospital, and their babies, through UKOSS. The data from these reports will be included in future versions of this guideline.

1.4 Effect 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 that are carrying the virus, although the incidence is unknown. Most women will experience only mild or moderate cold/flu like symptoms. Cough, fever, shortness of breath, headache and anosmia are other relevant symptoms.

It has long been known that, whilst pregnant women are not necessarily more susceptible to viral illness, changes to their immune system in pregnancy can be associated with more severe symptoms. This is particularly true towards the end of pregnancy. The absolute risks are, however, small.[8] More severe symptoms such as pneumonia and marked hypoxia are widely described with COVID-19 in older people, the immunosuppressed and those with long-term conditions such as diabetes, cancer and chronic lung disease.[9] These same severe symptoms could occur in pregnant women and so should be identified and treated promptly.

There have been case reports of women with severe COVID at the time of birth who have required ventilation and extracorporeal membrane oxygenation.[10] A single case report has been published in scientific literature of a maternal death and intrauterine fetal death at 30 weeks' gestation. These deaths, which occurred in Iran, were directly attributed to COVID-19.[11]

Two cases series have recently been published by clinicians in New York. The first describes 43 women who tested positive for COVID-19 and showed 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 the comparison not made to age, sex or co-morbidity-matched individuals.[12] The second describes the results of screening all 215 women who attended two paired maternity units for labour and birth over a 2 week period. Of these, 15.4% of women tested positive for SARS-CoV-2 from naso-pharyngeal swabs on attendance to the

hospital. Most were asymptomatic; only 4 (1.9%) had symptoms of COVID-19 on attendance and 3 others developed fever or possible symptoms during their inpatient stay. In the UK, the Intensive Care National Audit and Research Centre weekly report on individuals admitted to critical care with COVID-19 was updated on 10 April 2020, describing the first 3,883 patients admitted to critical care settings with a diagnosis of COVID-19, ten were pregnant and 13 recently pregnant (within the last six weeks). The rate of current/recent pregnancy amongst all individuals admitted to critical care (2.3%) remains similar to the reported rate for non-COVID viral pneumonia during 2017-19 (3.3%), although the number of people admitted is higher for all groups.[13] Other reported cases of COVID-19 pneumonia in pregnancy are milder and with good recovery.[14]

Individual responses to viral infection are different for different pregnant women and for different viruses. However, influenza and pregnancy provides a useful comparator: data from Australia, examining critical illness in pregnancy and the postpartum period due to the infection H1N1, identified significant increases in critical illness in later pregnancy, compared with early pregnancy.[15] In other types of coronavirus infection (SARS, MERS), the risks to pregnant women appear to increase in particular during the last trimester of pregnancy. In at least one study, there was an increased risk of preterm birth being indicated for maternal medical reasons after 28 weeks' gestation.[16]

Given that pregnancy is known to be a hypercoagulable state, and emerging evidence suggests that individuals admitted to hospital with COVID-19 are also hypercoagulable,[17] it follows that infection with COVID-19 is likely to be associated with an increased risk of maternal venous-thromboembolism.[18] Reduced mobility resulting from self-isolation at home, or hospital admission, is likely to increase the risk further.

1.5 Effect on the fetus

There are currently no data suggesting an increased risk of miscarriage or early pregnancy loss in relation to COVID-19. Case reports from early pregnancy studies with SARS and MERS do not demonstrate a convincing relationship between infection and increased risk of miscarriage or second trimester loss.[19]

There is no evidence currently that the virus is teratogenic. Very recent evidence has, however, suggested that it is probable that the virus can be vertically transmitted, although the proportion of pregnancies affected and the significance to the neonate has yet to be determined.[2,3]

There are case reports of preterm birth in women with COVID-19, but it is unclear whether this was iatrogenic in every case, or whether some were spontaneous. Iatrogenic birth was predominantly for maternal indications related to the viral infection, although there was evidence of fetal compromise and prelabour preterm rupture of the membranes in at least one report.[4,20]

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2. Advice for health professionals to share with pregnant women

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2.1 General advice

As a pregnant woman the news that you were placed in a 'vulnerable group' by the UK Government on Monday 16 March 2020 may have caused you concern.

The evidence to date is that pregnant women are still no more likely to contract the infection than the general population. What is known is that pregnancy, in a small proportion of women, can alter the body's response to severe viral infections. This is something that midwives and obstetricians have known for many years and are used to dealing with.

What has driven the decisions made by officials is the need to restrict spread of illness. This is because if the number of infections were to rise sharply, the number of severely infected pregnant women could also rise, potentially putting them in danger.

Our general advice is that:

- If you are infected with COVID-19 you are still most likely to have no symptoms or a mild illness from which you will make a full recovery.
- If you develop more severe symptoms or your recovery is delayed, this may be a sign that you are developing a more significant chest infection that requires enhanced care. Our advice remains that if you feel your symptoms are worsening or if you are not getting better, you are recommended to contact the NHS on 111 (or a local alternative), or your maternity unit, or in an emergency 999, straight away for further information and advice.

2.2 Advice regarding social distancing and self-isolation

The UK Government has decided that, given the limited information currently available about how COVID-19 could affect pregnancy, it would be prudent for pregnant women to stringently engage with social distancing measures to reduce the risk of infection.

All pregnant women, regardless of gestation, should observe the social distancing and self-isolation guidance available on the Government website. Advice includes the avoidance of contact with people who are known to have COVID-19 or those who exhibit possible symptoms:

- For all vulnerable people including pregnant women [21]
- For individuals and households of individuals with symptoms of new continuous cough or fever [22]
- Major measures for people at highest risk from coronavirus. This includes pregnant women with significant heart disease (congenital or acquired) or any individuals with specific cancers, severe respiratory conditions (such as cystic fibrosis and severe asthma) and those with rare diseases and inborn errors of metabolism that significantly increase the risk of infections (such as sickle cell disease).[23]

Women above 28 weeks' gestation are recommended to be particularly attentive to social distancing and minimising contact with others.

Specific recommendations regarding going to work have been published separately on the RCOG website.

2.3 Advice regarding your appointments or urgent visits to clinics and hospitals

If you are well at the moment and have had no complications in your previous pregnancies, the following practical advice may be helpful:

- If you have a routine scan or visit due in the coming days, please contact your maternity unit for advice and to agree a plan. You may still be advised to attend for a visit, but this appointment may change due to staffing requirements.
- If you are between appointments, please wait to hear from your maternity team.
- If you are advised to attend for a scan or an appointment by your local maternity team, this is because the need for the appointment is greater than your risk of being exposed to COVID-19. Antenatal care is essential to support you in having a healthy pregnancy and so we strongly advise you do attend if asked to do so. If you have any concerns about this, please discuss with your maternity unit.

If you are attending more regularly in pregnancy, then your maternity team will be in touch with plans for further appointments, as required.

Whatever your personal situation please consider the following:

- Maternity care is essential and has been developed over many years to reduce complications in pregnant women and babies. The risks of not attending antenatal care include harm to you, your baby or both of you, even in the context of coronavirus. It is important that you keep in contact with your maternity team and continue to attend your scheduled routine care when you are well.

- If you are concerned about your or your baby's wellbeing, including the baby's movements, it remains of critical importance that you seek advice and care from maternity services without delay. This is a very challenging time, particularly if you have concerns about your pregnancy and are worried about entering a hospital. Maternity units are doing everything they can to minimise the spread of coronavirus infection to healthy women and their babies, including restricting access to visitors, using appropriate protection equipment and infection control measures. It is very important not to be deterred from coming into hospital when you or your baby need care. If you have an urgent problem related to your pregnancy but not related to coronavirus, get in touch using the same emergency contact details you already have.

- If you or anyone in your household has symptoms of COVID-19, please contact your maternity team and they will arrange the right place and time to come for your visits. You should not attend a routine clinic, unless specific arrangements have been made.

- You will be asked to come alone to clinical appointments, or keep the number of people with you to one (including midwifery visits in your home). This will include being asked not to bring your children with you to appointments. This is important in order to protect maternity staff, other women and babies, and you and your family from the risk of infection.

- There may be a need to reduce the number of antenatal visits you have. This will be communicated with you, and will be done as safely as possible, taking into account available evidence on the safe number of visits required. Please attend all your scheduled appointments, and if you have concerns about this please discuss with your maternity team.

At this time, it is particularly important that you help your maternity team take care of you. If you have had an appointment cancelled or delayed and are not sure of your next contact with your maternity team, please let them know by using the contact numbers provided to you at booking.

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3. Advice for all midwifery and obstetric services caring for pregnant women

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3.1 Reducing the transmission of COVID-19 in maternity settings

Most women attending maternity services are healthy and are advised to maintain stringent social distancing. It is recognised that women may have significant anxiety about the possibility of contracting COVID-19 by attending maternity services, particularly where located in hospitals. It is important that maternity services do all they can to protect women from contracting COVID-19 during their maternity care by following PHE infection prevention and control guidance stringently and using appropriate PPE.

Particular consideration should be given to the care of pregnant women with comorbidities who are 'shielded'. These women should be provided with a mask during hospital visits. Their status should be clearly noted at any handover; shared waiting areas should be avoided; and if admitted they should be in a side room.

3.2 General advice regarding the continued provision of antenatal and postnatal services

The situation is currently moving very fast and reconfiguration of services is likely to be necessary. At present, the following is recommended:

- Antenatal and postnatal care is based on years of evidence to keep women and babies safe in pregnancy and birth. Antenatal and postnatal care should therefore be regarded as essential care and women should be encouraged to attend, despite being advised to otherwise engage with social distancing measures.

- Women should be advised to attend routine antenatal care unless they meet current self-isolation guidance for individuals and households of individuals with symptoms of new continuous cough or fever.[22] Maternity care has been shown repeatedly to be essential, and studies in the UK and internationally have shown that if women do not attend antenatal services they are at increased risk of maternal death, stillbirth, and other adverse perinatal outcomes. [24,25]

- Units should rapidly seek to adopt teleconferencing and videoconferencing capability and consider what appointments can be conducted remotely. We hope to issue further guidance on this soon.

The NHS has provided guidance on the relaxation of information governance requirements for video calling.

- Record keeping remains paramount.
- Electronic record systems should be used and, where remote access for staff or women is an available function, this should be expedited. When seeing women face-to- face, simultaneous electronic documentation will facilitate future remote consultation.
- Units should appoint a group of clinicians to coordinate care for women forced to miss appointments due to self-isolation. Women should be able to notify the unit of their self-isolation through telephone numbers that are already available to them. Appointments should then be reviewed for urgency and either converted to remote appointments, attendance appropriately advised or deferred.
    - For women who have had symptoms, appointments can be deferred until 7 days after the start of symptoms, unless symptoms (aside from persistent cough) persevere.
    - For women who are self-isolating because someone in their household has possible symptoms of COVID-19, appointments should be deferred for 14 days.
- Units should have a system to flag women who have missed serial appointments, which is a particular risk for women with small children who may become sequentially unwell.
- Any woman who has a routine appointment delayed for more than 3 weeks should be contacted and an appointment scheduled urgently.
- 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. It is important that care is available to ensure continued support for women with multiple complex needs. Women living with adversity including poverty, homelessness, substance misuse, being an asylum seeker, experiencing domestic abuse and mental health problems will continue to require timely expert support.
- Individualised plans for women requiring frequent review may be necessary.
- Visitor restrictions, including for women admitted to maternity services for antenatal and postnatal care, are in place in most settings across the UK. Midwifery, obstetric and support staff should be aware, as they normally are, of the support needs for all women and the practical challenges of caring for newborns after birth.

3.3 General advice regarding possible service modifications during COVID-19

Service modifications may be 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.

Units should identify areas where there are clear possibilities for rationalisation of services.

Particular possibilities include:

- Reducing induction of labour for indications that are not strictly necessary.[26 27]
- Improving outpatient provision of induction of labour, depending on availability of transport to hospital.
- Reducing routine growth scans where this is not for a strict guidance-based indication. Additional modified guidance is available for services in England in the Saving Babies' Lives Care Bundle, appendix G.

We are developing, together with a wide range of co-authors, a series of guidance documents to assist maternity units with changes to services that they provide, which may occur during the COVID-19 pandemic. These are available on the RCOG website and include:

- Guidance for early pregnancy services.
- Guidance for antenatal and postnatal services.
- Guidance for antenatal screening (including screening ultrasound).
- Guidance for fetal medicine services.
- Guidance for maternal medicine clinics.
- Guidance for self-monitoring of blood pressure in pregnancy (for women with hypertensive disorders of pregnancy).
- Guidance for midwifery-led birth settings.

3.4 General advice regarding intrapartum services

- Intrapartum services should be provided in a way that is safe, with reference to minimum staffing requirements and the ability to provide emergency obstetric, anaesthetic and neonatal care where needed.

- Women should be permitted and encouraged to have a birth partner present with them during their labour and birth. A single, asymptomatic birth partner should be permitted to stay with the woman, at a minimum, through labour and birth, unless the birth occurs under general anaesthetic. Having a trusted birth partner present throughout labour is known to make a significant difference to the safety and well-being of women in childbirth.[28-30]

    - When a woman contacts the maternity unit in early labour, she should be asked about whether she or her birth partner have had any symptoms which could suggest COVID-19 in the preceding seven days. If her partner has had onset of symptoms in the last seven 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.

    - 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 seven days. If the onset of these symptoms was seven days or less ago, or they still have symptoms (other than persistent cough), they should be asked to leave the maternity unit immediately and self-isolate at home.

    - The **symptoms** to ask about are: fever, acute persistent cough, hoarseness, nasal discharge/ congestion, shortness of breath, sore throat, wheezing or sneezing.[31]

    - Birth partners who are not symptomatic of COVID-19 should be asked to remain by the woman's bedside and to not walk around the ward/hospital. We recommend they 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.

- Restrictions on other visitors should follow hospital policy. This might include limiting the number of birth partners to one, restricting any or all visitors to antenatal or postnatal wards (to ensure compliance with social distancing measures), and preventing swapping of postnatal visitors. We support visitor restrictions across all hospital wards, including maternity units, to comply with government

recommendations for social distancing and to reduce the risk of transmission to women, their babies, staff and visitors themselves.

3.5 Smoking cessation and carbon monoxide monitoring in pregnancy

Smoking is very likely to be associated with more severe disease in COVID-19, although current evidence does not accurately estimate the effect. This risk should be included when counselling women about the need to stop smoking as soon as possible during pregnancy.[33]

The National Centre for Smoking Cessation and Training (NCSCT) has recommended that carbon monoxide monitoring during pregnancy be paused, as a precautionary measure following concern about the risk of coronavirus transmission.

All women should still be asked about their smoking status at antenatal appointments, and if smoking, be referred to (telephone-based) stop smoking services on an opt out basis. Nicotine replacement therapy should be offered and household members who smoke can also be signposted to support. Further guidance is available, including in Appendix H of the Saving Babies' Lives Care Bundle for England.

3.6 Maternal mental wellbeing

This pandemic will inevitably result in an increased amount of anxiety in the general population, and this is likely to be even more so for pregnant women as pregnancy represents an additional period of uncertainty. Specifically, these anxieties are likely to revolve around:

- COVID-19 itself,
- The impact of social isolation resulting in reduced support from wider family and friends,
- The potential of reduced household finances,
- Major changes in antenatal and other NHS care, including appointments being changed from face-to-face to telephone contact.

Isolation, bereavement, financial difficulties, insecurity and inability to access support systems are all widely recognised risk factors for mental ill-health. The coronavirus epidemic also increases the risk of domestic violence.[34] Additional advice regarding support for victims of domestic violence during the COVID-19 pandemic is available here.

The change in appointment style will also make assessment for women experiencing domestic violence, women with safeguarding concerns, women who are misusing substances and women with complex mental health difficulties more challenging. If identified, the usual referrals should still be made to appropriate services.

Simply by acknowledging these difficulties, healthcare professionals can help to contain some of these anxieties.

Women should be asked about mental health at every contact. Women who require support should be signposted to resources which can be remotely provided, where possible. This includes accessing:

- 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 from the RCPsych website.

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4. Advice for services caring for women with suspected or confirmed COVID-19

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The following advice refers mostly to the care of women in the second or third trimesters of pregnancy.

Specific advice regarding the acute care of pregnant women admitted with moderate or severe symptoms of COVID-19 can be found in section 4.6.

Care of women in the first trimester should include attention to the same infection prevention and investigation/diagnostic guidance as for the general population with COVID-19. Separate RCOG guidance is available for modifications to early pregnancy services during the pandemic.

4.1 General advice for services providing care to pregnant women with suspected or confirmed COVID-19, where hospital attendance is necessary

The following suggestions apply to all hospital/clinic attendances for women with suspected or confirmed COVID-19:

- Women should be advised to attend via private transport where possible.
- If an ambulance is required, the woman should alert the call handler that she is currently in self-isolation for possible or confirmed COVID-19 affecting either her or her household contact.
- Women should be asked to alert a member of maternity staff to their attendance when on the hospital premises, by telephone, prior to entering the hospital.
- Staff providing care should take personal protective equipment (PPE) precautions as per local health protection guidance.[35]
- Women should be met at the maternity unit entrance by staff wearing appropriate PPE and be provided with a fluid-resistant surgical mask. The face mask should not be removed until the woman is isolated in a suitable room or cohort bay.
- 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.
- Further advice on care in isolation rooms and COVID-19 cohort bays is available from PHE.

- Only essential staff should enter the room and visitors should be kept to a minimum.
- All non-essential items from the clinic/scan room should be removed prior to the woman's arrival.
- All clinical areas used must be cleaned after use, as per health protection guidance.[35]

4.2 Women with unconfirmed COVID-19 but symptoms suggestive of possible infection

For women who phone maternity services:

Women may attend maternity units in person, or call maternity services by telephone, to report symptoms which are suggestive of COVID-19.

When women phone maternity services for advice regarding symptoms which may be attributed to COVID-19, consider differential diagnoses which could otherwise explain fever, cough, shortness of breath or similar. This includes, but is not limited to: urinary tract infection, chorioamnionitis, pulmonary embolism etc.

For women who attend maternity units in person:

Maternity departments with direct entry for women and the public should have a system in place for identifying potential cases at first point of contact. This should be before the woman or accompanying visitors take a seat in the waiting area.

Women may attend hospital for reasons directly related to pregnancy and also have coincidental symptoms meeting the COVID-19 case definition. In cases of uncertainty, seek additional advice or in case of emergency, investigate and treat as suspected COVID-19 until advice can be sought. Suspected COVID-19 should not delay administration of therapy that would be usually given (for example, IV antibiotics in woman with fever and prolonged rupture of membranes).

Women should be tested for COVID-19 if they meet **PHE criteria**. Current criteria (correct at the time of publishing this update) are:

Women who are being/are admitted to hospital with one of the following:

- Clinical/radiological evidence of pneumonia,
- Acute Respiratory Distress Syndrome (ARDS),
- Fever ≥37.8 AND at least one of acute persistent cough, hoarseness, nasal discharge/congestion, shortness of breath, sore throat, wheezing or sneezing.

Furthermore, we recommend that women with an isolated fever should be investigated and treated according to the unit protocol. This will include sending a full blood count. If lymphopenia is identified on the full blood count, testing for COVID-19 should also be arranged.

In the event of a pregnant woman attending with an obstetric emergency and being suspected or confirmed to have COVID-19, maternity staff must first follow IPC guidance. This includes transferring the woman to an isolation room and donning appropriate PPE. This can be time consuming and stressful for women, their birth partner and health professionals. Once IPC measures are in place, the obstetric emergency should be dealt with as the priority. Do not delay obstetric management in order to test for COVID-19.

Until test results are available, the woman with suspected COVID-19 should be treated as though it is confirmed . The full **Public Health England guidance** has been summarised in a flowchart (Appendix 1).[31]

4.3 Antenatal care in women who are self-isolating at home

Women with mild-moderate symptoms of suspected COVID-19 are advised to self-isolate at home, according to **government guidelines**.

The guidance in this section can also be applied to antenatal care for women who are self-isolating at home because they live with another person who has symptoms indicative of possible COVID-19.

4.3.1 Risk of venous-thromboembolism

For women who are self-isolating at home, ensure they stay well hydrated and are mobile throughout this period. Women who have thromboprophylaxis already prescribed should continue taking this.

If women are concerned about the development of venous thromboembolism (VTE) during a period of self-isolation, a clinical review (in person or remotely) should be attempted to assess VTE risk, and thromboprophylaxis considered and prescribed on a case-by-case basis. If their VTE risk score at booking is 3 or more then commencement of prophylactic LMWH should be recommended. A prescription can be sent through the post along with a video link of how to self-inject, or a video appointment following receipt.

Local procedures should be followed in ensuring the supply of low molecular weight heparin (LMWH).

4.3.2 Managing planned appointments during the self-isolation period

Routine appointments for women who are self-isolating at home (growth scans, oral glucose tolerance test, antenatal community or secondary care appointments) should be delayed until after the recommended period of self-isolation. Advice to attend more urgent pre-arranged appointments (fetal medicine surveillance, high risk maternal secondary care) will require a senior decision on urgency and potential risks/benefits.

Trusts/boards are advised to arrange local, robust communication pathways for senior maternity staff members to screen and coordinate appointments missed due to periods of self-isolation at home.

If it is deemed that obstetric or midwifery care cannot be delayed until after the recommended period of isolation, infection prevention and control measures should be arranged locally to facilitate care. Pregnant women in self-isolation who need to attend should be contacted by a local care coordinator to re-book urgent appointments / scans, preferably at the end of the working day.

If ultrasound equipment is used, this should be decontaminated after use in line with guidance.

4.3.3 Attendance for unscheduled/urgent antenatal care in women with suspected or confirmed COVID-19

When possible, early pregnancy units (EPUs) or maternity triage units should provide advice over the telephone. If this requires discussion with a senior member of staff who is not immediately available, a return call should be arranged as soon as possible.

Local protocols are required to ensure women currently self-isolating are also isolated on arrival to EPUs or maternity triage units and full PPE measures are in place for staff (see Section 4.1).

Medical, midwifery or obstetric care should otherwise be provided as per routine.

4.4 Women who develop new symptoms of COVID-19 during admission (antenatal, intrapartum or postnatal).

There is an estimated incubation period for COVID-19 of 0-14 days (mean 5-6 days); an infected woman may therefore initially present asymptomatically, developing symptoms later during an admission.[36] Health professionals should be aware of this possibility, particularly those who regularly measure patient vital signs (e.g. healthcare assistants).

Women with new onset respiratory symptoms, which meet the PHE case-definition for suspected COVID-19 (section 2), should be isolated with appropriate infection control precautions and investigated for possible SARS-COV-2 infection, amongst other differential diagnoses. The local Infection Prevention and Control team should be notified.

Furthermore, we recommend that women with an isolated fever should be investigated and treated according to the unit's protocol. This will include sending a full blood count. If lymphopenia is identified on the full blood count, or the woman has other symptoms suggestive of COVID-19, testing for COVID-19 should be considered.

Suspected COVID-19 should not delay administration of therapy that would otherwise usually be given (for example, IV antibiotics in woman with fever and prolonged rupture of membranes).

Recommended care for women who have moderate to severe symptoms of COVID-19 during pregnancy is covered in section 4.6.

4.5 Women attending for intrapartum care with suspected or confirmed COVID-19

4.5.1 Attendance in labour

All women should be encouraged to call the maternity unit for advice in early labour. Women with mild COVID-19 symptoms can be encouraged to remain at home (self-isolating) in early (latent phase) labour as per standard practice.

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 infected with COVID-19.[4] Attending an obstetric unit, where the baby can be monitored using continuous electronic fetal

monitoring (EFM), should be recommended for birth. When a woman attends the maternity unit, general recommendations about hospital attendance apply (see section 4.1).

Once settled in an isolation room, a full maternal and fetal assessment should include:

- Assessment of the severity of COVID-19 symptoms by the most senior available clinician.
- Discussion with a multidisciplinary team (MDT), including an infectious diseases or general medical specialist.
- Maternal observations including temperature, respiratory rate and oxygen saturations.
- Confirmation of the onset of labour, as per standard care.
- EFM using cardiotocograph (CTG).
    - In two Chinese case series, including a total of 18 pregnant women infected with COVID-19 and 19 babies (one set of twins), there were eight reported cases of fetal compromise.[4,7] Given this relatively high rate of fetal compromise, continuous EFM in labour is currently recommended for all women with COVID-19.
- If the woman attends with 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** (see section 2 for COVID-19 case definition).

If there are no concerns regarding the condition of either the woman or baby, women who would usually be advised to return home until labour is more established, can still be advised to do so, if appropriate transport is available.

Women should be given the usual advice regarding signs and symptoms to look out for, but in addition should be told about symptoms that might suggest deterioration related to COVID-19 following consultation with the medical team (e.g. difficulty in breathing).

If labour is confirmed, then care in labour should ideally continue in the same isolation room.

4.5.2 Care in labour

Considerations when caring for women in spontaneous or induced labour:

- 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.
- 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.
- Asymptomatic birth partners should be asked to wash their hands frequently. If symptomatic, birth partners should remain in self-isolation at home and not attend the unit. Women should be advised in advance, to identify an alternative birth partner, should the need arise.
- Maternal observations and assessment should be continued as per standard practice, with the addition of hourly oxygen saturations.
    - Aim to keep oxygen saturation more than 94%, titrating oxygen therapy accordingly.
- 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 (see section 2 for COVID-19 case definition).
- Given the rate of fetal compromise reported in the two Chinese case series,[4,7] the current recommendation is for continuous electronic fetal monitoring in labour.
- In case of deterioration in the woman's symptoms, refer to Section 4.6 for additional considerations, and make an individual assessment 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.
- The neonatal team should be given sufficient notice at the time of birth, to allow them to attend and don PPE before entering the room/theatre.
- Given a lack of evidence to the contrary, delayed cord clamping is still recommended following birth, provided there are no other contraindications. The baby can be cleaned and dried as normal, while the cord is still intact.

Regarding mode of birth:

- There is currently no evidence to favour one mode of birth over another and therefore mode of birth should be discussed with the woman, taking into consideration her preferences and any obstetric indications for intervention.
- Mode of birth should not be influenced by the presence of COVID-19, unless the woman's respiratory condition demands urgent intervention for birth.
- Where vaginal secretions have been tested for COVID-19, the results have been negative.
- The use of birthing pools in hospital should be avoided in suspected or confirmed cases, given the risk of infection via faeces.
- When caesarean birth or other operative procedure is advised, follow guidance from Section 4.7.2.
    - For emergency caesarean births, donning PPE is time-consuming. This may impact on the decision to delivery interval but it must be done. Women and their families should be told about this possible delay.
- An individualised informed discussion and decision should be made regarding shortening the length of the second stage of labour with elective instrumental birth in a symptomatic woman who is becoming exhausted or hypoxic.

Regarding analgesia:

- There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses. Epidural analgesia should therefore be recommended in labour, to women with suspected or confirmed COVID-19 to minimise the need for general anaesthesia if urgent intervention for birth is needed.
- Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.
    - There is no evidence that the use of Entonox is an aerosol-generating procedure (AGP).

Risk of venous-thromboembolism

- Following birth, women should be risk assessed for venous thromboembolism.
- The first dose of LMWH should be administered as soon as possible after birth, provided there is no postpartum haemorrhage and regional analgesia has not been used.
    - Where regional analgesia has been used, LMWH can be administered 4 hours after the last spinal injection or removal of the epidural catheter.[17]

4.5.3 Personal protective equipment for labour

General advice from PHE on type and specification of PPE is **available here**. Particular advice from Public Health England on type and specification of PPE for different maternity settings is available as part of the **table here**.

Caesarean birth: specific advice on PPE when caring for pregnant women with suspected/confirmed COVID-19 requiring Caesarean birth is detailed in section 4.7.

4.5.4 Elective (planned) caesarean birth

Where 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. 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.

In cases where elective caesarean birth cannot safely be delayed, the general advice for services providing care to women admitted when affected by suspected/confirmed COVID-19 should be followed (see Section 4.1), as should the advice on PPE for caesarean birth (see section 4.7).

Obstetric management of elective caesarean birth should be according to usual practice.

4.5.5 Planned induction of labour

As for elective caesarean birth, an individual assessment should be made regarding the urgency of planned induction of labour for women currently in self-isolation because of suspected COVID-19 affecting either

themselves or a household contact. If induction of labour cannot safely be delayed, the general advice for services providing care to women admitted to hospital when affected by suspected/confirmed COVID-19 should be followed (see Section 4.1). Women should be admitted into an isolation room; in which they should ideally be cared for the entirety of their hospital stay.

4.6 Additional considerations for women with confirmed COVID-19 and moderate/severe symptoms

When pregnant women with moderate or severe signs and symptoms of suspected or confirmed COVID-19 infection are being cared for in any hospital setting, the following recommendations apply in addition to those specified for women with no or mild symptoms:

- A MDT planning meeting ideally involving a consultant physician (infectious disease specialist where available), consultant obstetrician, midwife-in-charge and consultant anaesthetist responsible for obstetric care should be arranged urgently. The discussion should be shared with the woman. The following 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 condition of the baby.
- The priority for medical care should be to stabilise the woman's condition with standard therapies.
    - A useful summary on supportive care for adults diagnosed with COVID-19 has been published by the World Health Organisation (WHO).[38]
    - Specific guidance on the management of patients with COVID-19 who are admitted to critical care has now been published by NICE.[39]
- Hourly observations should include respiratory rate and oxygen saturations, looking for the number and trends.
    - Young fit women can compensate during a deterioration in respiratory function and are able to maintain normal oxygen saturations before sudden clinical decompensation.

- Signs of decompensation include an increase in oxygen requirements or FiO2 > 40%, a respiratory rate of greater than 30, reduction in urine output, or drowsiness, even if the saturations are normal.

- Escalate urgently if any signs of decompensation develop in a woman who is pregnant or has recently given birth.

- Titrate oxygen to keep saturations >94%.

- 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 chest, is essential for the evaluation of the unwell patient with COVID-19 and should be performed when indicated, and not delayed because of fetal concerns.[40-42]

  - Abdominal shielding can be used to protect the fetus as per normal protocols.

- Consider additional investigations to rule out differential diagnoses e.g. ECG, CTPA, echocardiogram.

- Do not assume all pyrexia is due to COVID-19 and also perform full sepsis-six screening.

  - Consider bacterial infection if the white blood cell count is raised (lymphocytes usually normal or low with COVID-19) and commence antibiotics.

- Apply caution with IV fluid management.

  - Given the association of COVID-19 with acute respiratory distress syndrome,[43] 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, in order to avoid the risk of fluid overload.

  - Try boluses in volumes of 250-500mls and then assess for fluid overload before proceeding with further fluid resuscitation.[38]

- All pregnant women admitted with COVID-19 infection (or suspected COVID-19 infection) should receive prophylactic low molecular weight heparin (LMWH), unless birth is expected within 12 hours (e.g. for a woman with increasing oxygen requirements).[17]
    - Where women with complications of COVID-19 are under the care of other teams, such as intensivists or acute physicians, the appropriate dosing regimen of LMWH should be discussed in an MDT that includes a senior obstetrician and a local VTE expert.
    - The diagnosis of PE should be considered in women with chest pain, worsening hypoxia (particularly if there is a sudden increase in oxygen requirements) or in women whose breathlessness persists or worsens after expected recovery from COVID-19.
- The frequency and suitability of fetal heart rate monitoring should be considered on an individual basis, taking into consideration the gestational age of the fetus and the maternal condition. If urgent intervention for birth is indicated for fetal reasons, birth should be expedited as normal, as long as the maternal condition is stable.
- An individualised assessment of the woman should be made by the MDT to decide whether emergency caesarean birth or induction of labour 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, the fetal condition, the potential for improvement following elective birth and the gestation of the pregnancy. The priority must always be the wellbeing of the woman.
    - 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.
- Steroids should be given when indicated by NICE guidance.
    - As per standard practice, urgent intervention for birth should not be delayed for their administration.[44]
    - There is no evidence to suggest that steroids for fetal lung maturation, when they would usually be offered, cause any harm in the context of COVID-19.

There are some reports that even after a period of improvement there can be a rapid deterioration. Following improvement in a woman's condition, consider an ongoing period of observation, where possible, for a further 24-48 hours. On discharge, advise the woman to return immediately if she becomes more unwell.

4.7 Specific peri-operative advice for healthcare professionals caring for pregnant women with suspected/confirmed COVID-19 who require surgical intervention

4.7.1 General advice for obstetric/emergency gynaecology theatre

- Elective/planned obstetric procedures (e.g. cervical cerclage or caesarean) should be scheduled at the end of the operating list.
- Non-elective or emergency procedures should be carried out in a second obstetric theatre, where available, allowing time for a full postoperative theatre clean as per local health protection guidance.[35]
- The number of staff in the operating theatre should be kept to a minimum, and all must wear appropriate PPE.
- All staff (including maternity, neonatal and domestic) should have been trained in the use of PPE so that 24-hour emergency theatres are available and possible delays reduced.
- Anaesthetic management for women with symptoms or confirmed COVID-19 should be with reference to anaesthetic guidance.
- Departments should consider organising dry-run simulation exercises to prepare staff, build confidence and identify areas of concern to prepare for emergency transfers to the operating theatre.

4.7.2 Advice regarding Personal Protective Equipment for Caesarean birth

Caesarean birth: the level of PPE required by healthcare professionals caring for a woman with COVID-19 who is undergoing a caesarean birth should be determined based on the risk of requiring a general anaesthetic (GA). Intubation is an AGP. This significantly increases the risk of transmission of coronavirus to the attending staff. Siting regional anaesthesia (spinal, epidural or CSE) is not an AGP.

For the minority of caesarean births, where GA is planned from the outset, all staff in theatre should wear PPE, with a FFP3 mask. The scrub team should scrub and don PPE before the GA is commenced.

For a non-urgent caesarean birth where regional anaesthesia is planned, the risk of requiring a GA is very small, as there is no time pressure.

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 based on 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.

These recommendations will be updated as required as further evidence and advice becomes available.

4.8 Postnatal care

4.8.1 Neonatal care

There are limited data to guide the postnatal care of babies of women who tested positive for COVID-19 in the third trimester of pregnancy. Literature from China has advised separate isolation of the infected woman and her baby for 14 days. However, routine precautionary separation of a woman and a healthy baby should not be undertaken lightly, given the potential detrimental effects on feeding and bonding. Given the current limited evidence, we advise that women and healthy babies, not otherwise requiring neonatal care, are kept together in the immediate postpartum period.

A risk and benefits discussion with neonatologists and families to individualise care in babies that may be more susceptible is recommended. All babies born to COVID-19 positive women should be cared for as per RCPCH guidance.[45]

4.8.2 Infant feeding

It is reassuring that in six Chinese cases, breastmilk tested negative for COVID-19;[4] however, given the small number of cases, this evidence should be interpreted with caution. The main risk of breastfeeding is the close contact between the baby and the woman, who is likely to share infective droplets.

In the light of the current evidence, we advise that the benefits of breastfeeding outweigh any potential risks of transmission of the virus through breastmilk. The risks and benefits of feeding choices, including the risk of holding the baby in close proximity where women may be infected, should be discussed with the parents.

The following 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 fluid-resistant surgical face mask, if available, while feeding or caring for the baby.
- Where 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.

4.8.3 Discharge and readmission to hospital

Any women or babies requiring readmission for postnatal obstetric or neonatal care during a period of self-isolation for suspected or confirmed COVID-19 are advised to telephone their local unit ahead of arrival and follow the attendance protocol as described in Section 4.1.

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5. Advice for services caring for women following isolation for symptoms, or recovery from confirmed COVID-19

5. Advice for services caring for women following isolation for symptoms, or recovery from confirmed COVID-19

5.1 Antenatal care for pregnant women following self-isolation for symptoms suggestive of COVID-19

Scheduled antenatal care that falls within the self-isolation period should be rearranged for post-isolation.

No additional tests, including ultrasound assessment of fetal growth, are necessary for women who have not requiried hospitalisation for COVID-19.

If a woman has previously tested negative for COVID-19, and she re-presents with symptoms that meet the case definition (section 2), COVID-19 should still be suspected (due to the rate of false negative results from COVID-19 naso-pharyngeal swabs).

5.2 Antenatal care for pregnant women following hospitalisation for confirmed COVID-19 illness

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.

For those recovering after acute illness, further antenatal care should be arranged for after the period of self-isolation.

Referral to antenatal ultrasound services for fetal growth surveillance is recommended 14 days after resolution of acute illness. Although there is no evidence yet that fetal growth restriction (FGR) is a risk of COVID-19, two-thirds of pregnancies with SARS were affected by FGR and a placental abruption occurred in a MERS case, so ultrasound follow-up seems prudent.[46,47]

5.3 Postnatal care for pregnant women immediately following hospitalisation for confirmed COVID-19 illness

At the time of discharge from hospital following a period of care for confirmed COVID-19, which includes the birth of their baby, all women should be prescribed at least 10 days of prophylactic LMWH. This should be offered regardless of the mode of birth. A longer course of LMWH should be prescribed if indicated by existing guidance.[17]

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.

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.

RCPCH guidance recommends that all families self-isolate at home for 14 days after birth of a baby to a woman with active COVID-19 infection.

Postnatal care should continue according to the recommended schedule, where safe to do so. Maternity services should offer a combination of face-to-face and remote postnatal follow-up, according to the woman and baby's needs. For example, women with hypertensive diseases of pregnancy may require face-to-face reviews, particularly if they don't have access to home blood pressure monitoring. If the baby is of low birth weight, premature or where there any concerns about feeding, face to face appointments will be needed in order to weigh and examine the baby fully.

Where is it essential that women receive a face-to-face review in the community, midwives are advised to wear appropriate PPE and follow social distancing and infection control guidance. In order to reduce the exposure of midwives to risk of infection, for home visits other members of the household should be asked not to be present in the room when the midwife is examining the woman and her baby.

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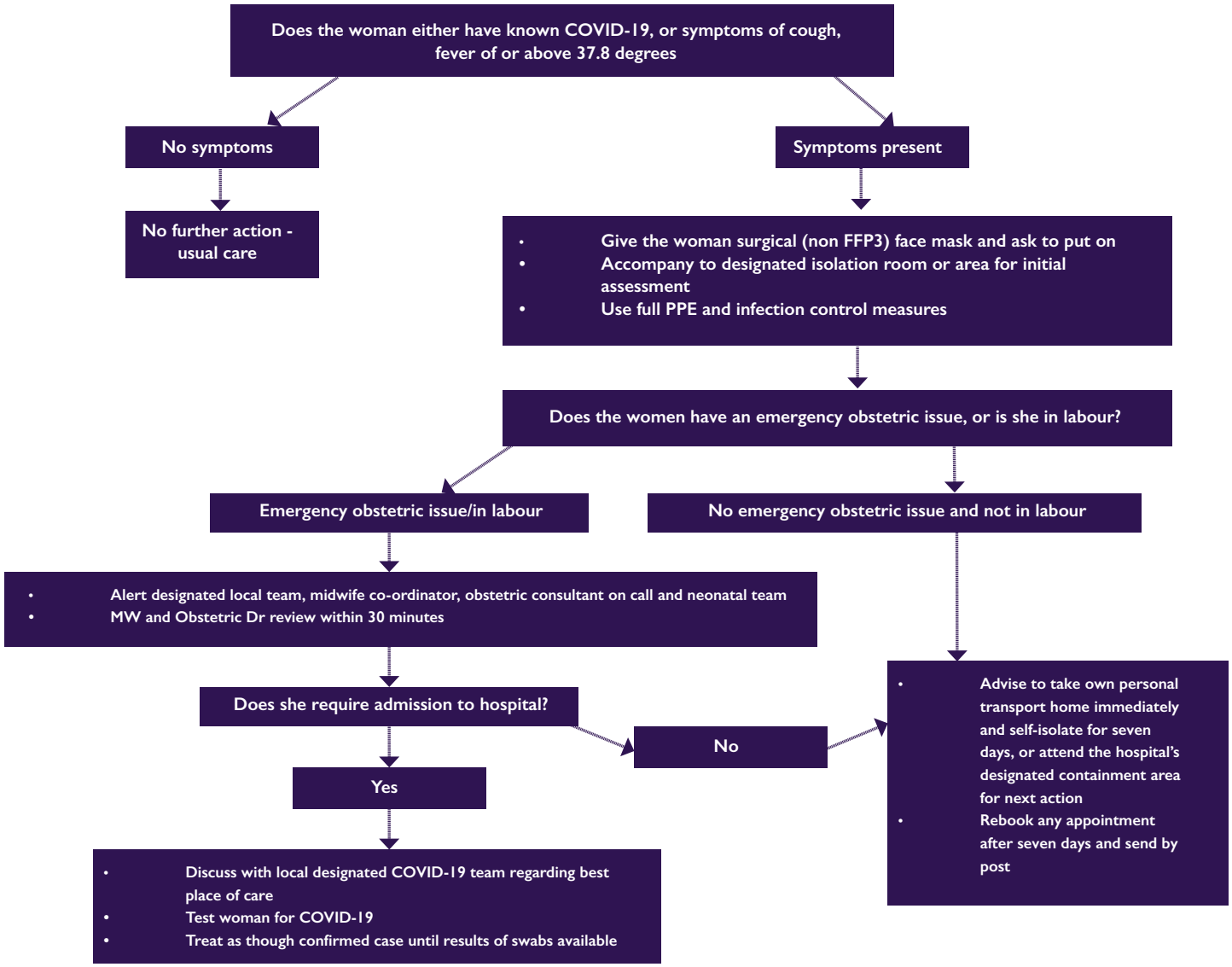
Appendix

Appendix 1: Flow chart to assess COVID-19 risk in maternity unit attendees



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

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 infected with COVID-19.

- Attending an obstetric unit, where the baby can be monitored using continuous electronic fetal monitoring (EFM), should be recommended for birth.

Timing of birth

- A positive COVID-19 result in an otherwise well woman, where there is also no evidence of fetal compromise, is not an indication to expedite birth.

- Induction of labour (IOL) is associated with longer periods of inpatient stay than for spontaneous onset of labour.

    - Review the indication for induction of labour and consider whether the likely benefits outweigh possible risks. Where possible review the provision of out-patient induction of labour, and consider whether this can be extended safely.

- 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 induction of labour if planned to occur during their period of self-isolation.

- 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.

Mode of birth

- There is currently no evidence to favour one mode of birth over another and therefore mode of birth should be discussed with the woman, taking into consideration her preferences and any obstetric indications for intervention.

- Mode of birth should not be influenced by the presence of COVID-19, unless the woman's respiratory condition demands urgent intervention for birth.

- The use of birthing pools in hospital should be avoided in suspected or confirmed cases, given that SARS-COV-2 has been identified in faeces and that commonly available PPE is not waterproof.

- An individualised informed discussion and decision should be made regarding shortening the length of the second stage of labour with elective instrumental birth in a symptomatic woman who is becoming exhausted or hypoxic.

- In case of deterioration in the woman's symptoms, make an individual assessment 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.

- For emergency caesarean births, donning PPE is time-consuming. This may impact on the decision to delivery interval but it must be done. Women and their families should be told about this possible delay.

Birth partners

- Women should be permitted and encouraged to have a birth partner present with them during their labour and birth. Having a trusted birth partner present throughout labour is known to make a significant difference to the safety and well-being of women in childbirth.

- When a woman contacts the maternity unit in early labour, she should be asked about whether she or her birth partner have had any symptoms which could suggest COVID-19 in the preceding seven days. If her partner has had onset of symptoms in the last seven days, the woman should be advised that her partner

should not attend the unit with her and she should be 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.

- 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 seven days. If the onset of these symptoms was seven days or less ago, or they still have symptoms (other than persistent cough), they should be asked to leave the maternity unit immediately and self-isolate at home.

- A single, asymptomatic birth partner should be permitted to stay with the woman, at a minimum, through labour and birth, unless the birth occurs under general anaesthetic.

- Birth partners who are not symptomatic of COVID-19 should be asked to remain by the woman's bedside, to not walk around the ward/hospital and to wash their hands frequently.

- 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.

- Restrictions on other visitors should follow hospital policy. This might include limiting the number of birth partners to one, restricting any or all visitors to antenatal or postnatal wards (to ensure compliance with social distancing measures), and preventing swapping of postnatal visitors.

Respect and consent

- Women must still be able to make decisions about the care they receive in line with the principles of informed consent.

Fetal surveillance

- Discuss with women the options for fetal surveillance in labour

- Recommend continuous electronic fetal monitoring as fetal compromise has been reported as the indication for emergency birth in early case series of pregnant women with COVID-19.

Pain relief

- There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses.
- Epidural analgesia should therefore be recommended in labour, to women with suspected or confirmed COVID-19 to minimise the need for general anaesthesia if urgent intervention for birth is needed.
- Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.
- There is no evidence that the use of Entonox is an aerosol-generating procedure (AGP).

Intrapartum care

- 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.
- Maternal observations and assessment should be continued as per standard practice, with the addition of hourly oxygen saturations.
- Aim to keep oxygen saturation more than 94%, titrating oxygen therapy accordingly.
- 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.
- 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.
    - Efforts should be targeted towards achieving neutral fluid balance in labour, in order to avoid the risk of fluid overload.

Immediate neonatal care

- The neonatal team should be given sufficient notice at the time of birth, to allow them to attend and don PPE before entering the room/theatre.

- Given a lack of evidence to the contrary, delayed cord clamping is still recommended following birth, provided there are no other contraindications. The baby can be cleaned and dried as normal, while the cord is still intact.

Infection control

- On arrival to hospital, women with suspected/confirmed COVID-19 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.

    - Further advice on care in isolation rooms and COVID-19 cohort bays is available from PHE.

- Only essential staff should enter the room and visitors should be kept to a minimum.

- All non-essential items from the clinic/scan room should be removed prior to the woman's arrival.

- General advice from PHE on type and specification of PPE is available here.

    - Particular advice from Public Health England on type and specification of PPE for different maternity settings is available as part of the table here.

- All clinical areas used must be cleaned after use, as per health protection guidance.

Potential risk factors to consider

- This pandemic will inevitably result in an increased amount of anxiety in the general population, and this is likely to be even more so for pregnant women as pregnancy represents an additional period of uncertainty. Specifically, these anxieties are likely to revolve around:
    - COVID-19 itself,
    - The impact of social isolation resulting in reduced support from wider family and friends,
    - The potential of reduced household finances, major changes in antenatal and other NHS care, including appointments being changed from face-to-face to telephone contact.

Isolation, bereavement, financial difficulties, insecurity and inability to access support systems are all widely recognised risk factors for mental ill-health. The coronavirus epidemic also increases the risk of domestic violence.

Appendix 3: Summary of 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 1:** 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.

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