



Royal College of
Obstetricians &
Gynaecologists

Coronavirus (COVID-19) Infection in Pregnancy

Information for healthcare professionals

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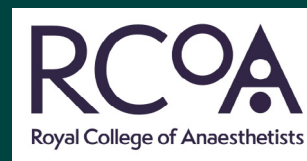


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Summary of updates

Version	Date	Summary of changes
2	13.3.20	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	<p>4.6.2: Advice about Entonox changed to</p> <p>There is no evidence that the use of Entonox is an aerosol-prone procedure</p> <p>Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.</p>
3	17.3.20	<p>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</p>
3	17.3.20	<p>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.'</p>
3	17.3.20	<p>Updated to reflect current public health guidance on self-isolation and social distancing</p>
3	17.3.20	<p>4.7.1: Advice on neonatal management and testing has been removed. Please refer to RCPCH guidance</p>
3	17.3.20	<p>6: Advice for healthcare professionals updated in line with Chief Medical Officer statement on Monday 16 March.</p>
4	21.3.20	<p>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.</p>

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

I. Introduction

I. 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 and (ii) the provision of safe care to 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 may be updated if or when new information becomes available. We therefore suggest that you visit this page regularly for updates.

On Friday 20 March 2020, the UK Obstetric Surveillance System launched a registry for all women admitted to a UK hospital 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.

Specific occupational health advice for employees and pregnant women during the COVID-19 pandemic is available in a separate guidance document available [here](#).

I.1 The virus

Novel coronavirus (SARS-CoV-2) is a new strain of coronavirus causing COVID-19, first identified in Wuhan City, China. Other coronavirus infections include the common cold (HCoV 229E, NL63, OC43 and HKU1), Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV).

I.2 Epidemiology

The virus appears to have originated in Hubei Province in China towards the end of 2019. Since then China has remained the country with the highest number of infected individuals. Within Europe, Italy is the country currently most affected.

This situation is naturally changing rapidly and for the most up to date advice please consult local Health Protection advice. Health Protection is a devolved matter and links to local guidance are available for [England](#), [Wales](#), [Scotland](#) and [Northern Ireland](#). Public Health England (PHE) and Health Protection Scotland (HPS) have been cited throughout this document; specific guidance from the other areas of the United Kingdom will be updated as they become available. 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.

I.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. Healthcare providers are recommended to employ strict infection prevention and control (IPC) measures; guidance is available 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 be related to more severe symptoms and this will be the same for COVID-19.

With regards to vertical transmission (transmission from mother to baby antenatally or intrapartum), case reports from China have concluded that there is no evidence for this.¹⁻⁶ Expert opinion is that the fetus is unlikely to be exposed during pregnancy. A case series published by Chen et al tested amniotic fluid, cord blood, neonatal throat swabs and breastmilk samples from COVID-19 infected mothers and all samples tested negative for the virus.¹ Furthermore, in a different paper by Chen et al, three placentas of infected mothers were swabbed and tested negative for the virus,⁷ and in another case series by the same team, of three infants born to symptomatic mothers tested for the coronavirus, none had positive tests.² The current evidence suggests that the virus is not present in genital fluid.⁶

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 just started centralised, real-time monitoring of affected mothers and their babies through [UKOSS](#), the data from which we will include in future versions of this guideline.

I.4 Effect on the mother/symptoms

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. The large majority of women will experience only mild or moderate cold/flu like symptoms. Cough, fever and shortness of breath 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. 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.⁸ These same symptoms could occur in pregnant women so should be identified and treated promptly. The absolute risks are, however, small.

At present there is one published case of a woman with COVID-19 who was admitted to hospital at 34 weeks' gestation, had an emergency caesarean section for a stillborn baby and was admitted to the intensive care unit with multiple organ dysfunction and acute respiratory distress syndrome, requiring extracorporeal membrane oxygenation.⁹ There are no reported deaths in pregnant women at present.

Individual responses to viral infection are different for different women and for different viruses. However, influenza and pregnancy provides a useful comparator: data from Australia have identified that there are significant increases in critical illness in later pregnancy, compared with early pregnancy.¹⁰ In other types of coronavirus infection (SARS, MERS), the risks to the mother appear to increase in particular during the last trimester of pregnancy. In at least one study, there was an increased risk of preterm delivery being indicated for maternal medical reasons after 28 weeks' gestation.¹¹

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.¹²

As there is no evidence of intrauterine fetal infection with COVID-19 it is therefore currently considered unlikely that there will be congenital effects of the virus on fetal development. There is no evidence currently that the virus is teratogenic.

There are case reports of preterm birth in women with COVID-19, but it is unclear whether the preterm birth was always iatrogenic, or whether some were spontaneous. Iatrogenic delivery 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.¹

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 Chief Medical Officer on Monday 16 March 2020 may have caused you concern.

We would like to reiterate that the evidence we have so far is that pregnant women are still no more likely to contract the infection than the general population. What we do know is that pregnancy in a small proportion of women can alter how your body handles 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 because if the number of infections were to rise sharply the number of severely infected women could rise and this could put the lives of some pregnant women 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, and our advice remains that if you feel your symptoms are worsening or if you are not getting better you should contact your maternity care team, NHS 111 or local alternative straight away for further information and advice.

2.2 Advice regarding social distancing and self-isolation

The UK Chief Medical Officer has decided that, given the limited information currently available about how COVID-19 could affect pregnancy, it would be prudent for pregnant women to increase their social distancing to reduce the risk of infection.

All pregnant women, regardless of gestation, should observe the social distancing guidance available on the Government website:

- 1) [For all vulnerable people including pregnant women](#) ¹³
- 2) [For individuals and households of individuals with symptoms of new continuous cough or fever](#) ¹⁴

You should pay particular attention to avoiding contact with people who are known to have COVID-19 or those who exhibit possible symptoms.

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

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 need to attend for a visit but the appointment may change due to staffing requirements.
- If you are between appointments, please wait to hear from your maternity team.

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:

- If you have any concerns, you will be able to contact your maternity team as usual but please note they may take longer than usual to get back to you.
- 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. Please do not contact this number unless you have an urgent problem.
- If you have symptoms of coronavirus, contact your maternity service and they will arrange the right place and time to come for your visits. You should not attend a routine clinic.
- You will be asked to keep the number of people with you to a minimum. This will include being asked to not bring children with you to maternity appointments.
- There may be a need to reduce the number of antenatal visits you have. This will be communicated with you. Do not reduce your number of visits without agreeing first 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.

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

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

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

- Care for pregnant and postnatal women is an essential service and should be planned for along with other essential services.
- 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.¹⁴
- 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 patients 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 co-ordinate care for women forced to miss appointments due to self-isolation. Women should be able to notify the unit of their self-isolation through phone 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 repeatedly unwell, and any woman who has a routine appointment delayed for more than 3 weeks should be contacted.
- Individualised plans for women requiring frequent review may be necessary.

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

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

The following advice refers mostly to the care of women in the second or third trimesters of pregnancy. Care of women in the first trimester should include attention to the same infection prevention and investigation/diagnostic guidance.

4.1 General advice for services providing care to pregnant women

Pregnant women have been advised to reduce social contact by the government based on the theoretical risks to pregnancy posed by COVID-19. Antenatal and postnatal care is based on years of evidence to keep mothers and babies safe in pregnancy and birth. The majority of antenatal and postnatal care should therefore be regarded as essential care and women should be encouraged to attend, even while minimising contact with others.

We recommend that, where practical, appointments should be conducted on the telephone or using videoconferencing, provided there is a reasonable expectation that maternal observations or tests are not required.

4.2 General advice for services providing care to women with suspected or confirmed COVID-19, for whom 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 or call 111/999 for advice as appropriate. If an ambulance is required, the call handler should be informed that the woman is currently in self-isolation for possible COVID-19.
- Women should be asked to alert a member of maternity staff to their attendance when on the hospital premises, but prior to entering the hospital.

- Staff providing care should take personal protective equipment (PPE) precautions as per local / [Public Health England](#) ¹⁵/[Health Protection Scotland](#) ¹⁶ guidance.
- Women should be met at the maternity unit entrance by staff wearing appropriate PPE and be provided with a surgical face mask (not FFP3 mask).
- Women should immediately be escorted to an isolation room where available, suitable for the majority of care during their hospital visit or stay.
 - Isolation rooms should ideally have an ante-chamber for donning and removing staff PPE equipment and ensuite bathroom facilities.
 - Further advice on care in isolation rooms versus COVID-19 cohort bays is available from Public Health England.
- Only essential staff should enter the room and visitors should be kept to a minimum.
- Remove non-essential items from the clinic/scan room prior to the woman arriving there.
- All clinical areas used will need to be cleaned after use as per local/[Public Health England](#) ¹⁵/[Health Protection Scotland](#) ¹⁶ guidance.

4.3 Women presenting for care with unconfirmed COVID-19 but symptoms suggestive of possible infection

Maternity departments with direct entry for patients and the public should have in place a system for identification of potential cases as soon as possible to prevent potential transmission to other patients and staff. This should be at first point of contact (either near the entrance or at reception) to ensure early recognition and infection control. This should be employed before a patient sits in the maternity waiting area.

Services should follow guidance available from the NHS about whether the woman is at risk of COVID-19. If a woman meets PHE criteria for COVID-19 testing, she should be tested. Until test results are available, she should be treated as though she has confirmed COVID-19. The full [Public Health England guidance](#)⁸ has been summarised in a flowchart for this guideline (Appendix 1).¹⁷

Pregnant women may attend for pregnancy reasons and have coincidental symptoms meeting current COVID-19 case definition. There are some situations where overlap between pregnancy symptoms and COVID-19 symptoms may cause confusion (e.g. fever with ruptured membranes). In cases of uncertainty, seek additional advice or in case of an emergency investigate and treat as suspected COVID-19 until advice can be sought.

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 patients 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.

Further care, in all cases, should continue as for a woman with confirmed COVID-19, until a negative test result is obtained.

4.4 Attendance for routine antenatal care in women with current suspected or confirmed COVID-19

Routine appointments for women with suspected or confirmed COVID-19 (growth scans, OGTT, 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 are advised to arrange local, robust communication pathways for senior maternity staff members to screen and coordinate appointments missed due to suspected or confirmed COVID-19.

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](#).

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

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

Local protocols are required to ensure women with confirmed or suspected COVID-19 are isolated on arrival to EPU 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.

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

There is an estimated incubation period of 0-14 days (mean 5-6 days); an infected woman may therefore present asymptotically, developing symptoms later during an admission.¹⁸

Health professionals should be aware of this possibility, particularly those who regularly measure patient vital signs (e.g. Health Care Assistants). [National guidance is available](#) on actions and when further assessment of the patient in the event of new onset respiratory symptoms or unexplained fever of or above 37.8 degrees.

4.7 Women attending for intrapartum care with current suspected/confirmed COVID-19

4.7.1 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 birth at home or in a midwifery-led unit is planned, a discussion should be initiated with the woman regarding the potentially increased risk of fetal compromise in women infected with COVID-19 (as was noted in the Chinese case series of nine women).¹ The woman should be advised to attend an obstetric unit for birth, where the baby can be monitored using continuous electronic fetal monitoring. This guidance may change as more evidence becomes available.

When a woman decides to attend the maternity unit, general recommendations about hospital attendance (Section 4.1) apply.

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

- Assessment of the severity of COVID-19 symptoms should follow a multi-disciplinary team approach including an infectious diseases or medical specialist.
- Maternal observations including temperature, respiratory rate and oxygen saturations.
- Confirmation of the onset of labour, as per standard care.
- Electronic fetal monitoring 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 8 reported cases of fetal compromise.^{1 4} Given this relatively high rate of fetal compromise, continuous electronic fetal monitoring in labour is currently recommended for all women with COVID-19.
- If the woman has signs of sepsis, 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 [guidance](#).

If there are no concerns regarding the condition of either the mother 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.

4.7.2 Care in labour

The following considerations apply to women in spontaneous or induced labour:

- When a woman with confirmed or suspected COVID-19 is admitted to the delivery suite, the following members of the multi-disciplinary team 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.
- There is evidence of household clustering and household co-infection.¹⁹ 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 self-isolation and not attend the unit. Women should be advised when making plans about birth to identify potential alternative birth partners, 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 >94%, titrating oxygen therapy accordingly.
- If the woman has signs of sepsis, 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 [guidance](#).
- Given the rate of fetal compromise reported in two Chinese case series,^{1,4} the current recommendation is for continuous electronic fetal monitoring in labour. This recommendation may be altered as more evidence becomes available.

- 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 delivery.
 - At present, there are no recorded cases of vaginal secretions being tested positive for COVID-19.
- The use of birthing pools in hospital should be avoided in suspected or confirmed cases, given the inability to use adequate protection equipment for healthcare staff during water birth and the risk of infection via faeces.
- There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses. Epidural analgesia should therefore be recommended before, or early in labour, to women with suspected/confirmed COVID-19 to minimise the need for general anaesthesia if urgent delivery is needed.
- There is no evidence that the use of Entonox is an aerosol-generating procedure (AGP).
- Entonox should be used with a single-patient microbiological filter. This is standard issue throughout maternity units in the UK.
- In case of deterioration in the woman's symptoms, refer to Section 4.8 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 mother.
- When caesarean birth or other operative procedure is advised, follow guidance from Section 4.7.4.
 - For category I caesarean section, 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 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.
- 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.

4.7.3 Specific advice regarding Personal Protective Equipment for labour

General advice from Public Health England on type and specification of PPE is available [here](#).

Specific advice from Public Health England on type and specification of PPE for labour and birth is available [here](#).

Caesarean birth: The level of Personal Protective Equipment (PPE) required by healthcare professionals caring for a woman with COVID-19 undergoing a caesarean birth should be determined based on the risk of requiring a general anaesthetic. Intubation for general anaesthesia (GA) is an aerosol-generating procedure (AGP). This significantly increases the risk of transmission of coronavirus to the attending staff. 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 full PPE, including a filtering face piece level 3 (FFP3) mask. The scrub team should scrub and don PPE before the GA is commenced.

For a non-urgent caesarean birth (Category 4 and some Category 3) where regional anaesthesia is planned, the risk of requiring GA is very small, as there is no time pressure. In this situation, all staff not required for siting of the regional anaesthetic should stay outside theatre until the block is effective. All staff in theatre should then don PPE with a fluid-resistant surgical mask (FRSM) and eye protection (to prevent against droplet or fomite spread of the virus).

In the small proportion of cases in which regional anaesthesia cannot be successfully achieved, and GA is required, the scrub team should enter the theatre, scrub and don full PPE, including an FFP3 mask, before the GA is commenced.

The chances of requiring conversion to GA during a caesarean birth commenced under regional anaesthesia are small but increase in relation to the urgency of caesarean birth. In situations where there are risk factors that make conversion to 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 GA is considered significant, the theatre team should scrub and don full PPE, including an FFP3 mask, before the procedure is commenced. An example is a woman whose epidural has been suboptimal during labour, which is 'topped-up' for an emergency caesarean birth.

If the risk of requiring conversion to GA is considered low, the theatre team should scrub and don PPE with an FRSM with eye protection. Examples include a woman whose epidural has been working well during labour and

has been 'topped-up' for an emergency caesarean birth or a woman with a newly sited spinal anaesthetic that was inserted without difficulty and became effective in the expected timeframe.

This recommendation will be updated as required as further evidence and advice becomes available.

4.7.4 General advice for obstetric theatre

- Elective procedures should be scheduled at the end of the operating list.
- Non-elective procedures should be carried out in a second obstetric theatre, where available, allowing time for a full post-operative theatre clean according to local/[Public Health England/Health Protection Scotland](#) guidance.^{15 21}
- 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 theatre use is available and possible delays reduced. Anaesthetic management for women with symptoms or confirmed COVID-19 should be with reference to [anaesthetic guidance](#) and <https://icmanaesthesiacovid-19.org/airway-management> for obstetric anaesthetic and general airway management respectively.
- Departments should consider running dry-run simulation exercises to prepare staff, build confidence and identify areas of concern.

4.7.5 Elective caesarean birth

Where women with suspected or confirmed symptoms of COVID-19, or confirmed COVID-19 have scheduled appointments for pre-operative care and elective caesarean birth, an individual assessment should be made to determine whether it is safe to delay the appointment to minimise the risk of infectious transmission to other women, healthcare workers and, postnatally, to her infant.

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 3.1).

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

4.7.6 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 with mild symptoms and suspected or confirmed COVID-19. 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.

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

The following recommendations apply in addition to those specified for women with no/mild symptoms.

4.8.1 Women admitted during pregnancy (not in labour)

When pregnant women are admitted to hospital with deterioration in symptoms and suspected/confirmed COVID-19 infection, the following recommendations apply:

- A multi-disciplinary discussion 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 as soon as possible following admission. The discussion and its conclusions should be discussed with the woman. The following should be discussed:
 - Key priorities for medical care of the woman;
 - 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 amongst 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 supportive care therapies.
 - At the time of publication, there was no UK guidance for supportive care for adults diagnosed with COVID-19, but a useful summary has been published by the [WHO](#).²²
- Particular considerations for pregnant women are:
 - Radiographic investigations should be performed as for the non-pregnant adult; this includes chest X-ray and 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 due to fetal concerns.²³⁻²⁵ Abdominal shielding can be used to protect the fetus as per normal protocols.
 - 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 delivery is indicated for fetal reasons, birth should be expedited as normal, as long as the maternal condition is stable.
 - If maternal stabilisation is required before delivery, this is the priority, as it is in other maternity emergencies, e.g. severe pre-eclampsia.
 - An individualised assessment of the woman should be made by the multidisciplinary team to decide whether elective birth of the baby 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 mother.
 - 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. Steroids should therefore be given when indicated. As is always the case, urgent delivery should not be delayed for their administration.

4.8.2 Women requiring intrapartum care

In addition to recommendations in Sections 4.8 and 4.9.1, for women with moderate/severe COVID-19 requiring intrapartum care it is also recommended that:

- The neonatal team should be informed of plans to deliver the baby of a woman affected by moderate to severe COVID-19, as far in advance as possible.
- With regards to mode of birth, an individualised decision should also be made, with no obstetric contra-indication to any method except water birth (see above). Caesarean section should be performed if indicated based on maternal and fetal condition as in normal practice.
- Given the association of COVID-19 with acute respiratory distress syndrome,²⁶ women with moderate-severe symptoms of COVID-19 should be monitored using hourly fluid input-output charts, and efforts targeted towards achieving neutral fluid balance in labour, in order to avoid the risk of fluid overload.

4.9 Postnatal management

4.9.1 Neonatal care

There are limited data to guide the postnatal management of babies of mothers who tested positive for COVID-19 in the third trimester of pregnancy. Reassuringly, there is no evidence at present of (antenatal) vertical transmission as of Friday 20 March 2020. Media reports to the contrary are, to our current knowledge, based on incorrect information.

Literature from China has advised separate isolation of the infected mother and her baby for 14 days. However, routine precautionary separation of a mother 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 infants, not otherwise requiring neonatal care, are kept together in the immediate post-partum period.

A risks / benefits discussion with neonatologists and families to individualise care in babies that may be more susceptible is recommended. We emphasise that this guidance may change as knowledge evolves.

All babies born to COVID-19 positive mothers should be cared for as [per RCPCH guidance](#).²⁷

4.9.2 Infant feeding

It is reassuring that in six Chinese cases tested, breastmilk was negative for COVID-19;¹ however, given the small number of cases, this evidence should be interpreted with caution. The main risk for infants of breastfeeding is the close contact with the mother, who is likely to share infective airborne 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 breastfeeding, including the risk of holding the baby in close proximity to the mother, should be discussed with her. This guidance may change as knowledge evolves.

For women wishing to breastfeed, precautions should be taken to limit viral spread to the baby:

- Hand washing before touching the baby, breast pump or bottles
- Avoiding coughing or sneezing on the baby while feeding at the breast
- Considering wearing a face mask while breastfeeding, if available
- Following recommendations for pump cleaning after each use
- Considering asking someone who is well to feed expressed milk to the baby

For women bottle feeding with formula or expressed milk, strict adherence to [sterilisation guidelines](#) is recommended. Where mothers are expressing breastmilk in hospital, a dedicated breast pump should be used.

4.9.3 Discharge and readmission to hospital

Any mothers or babies requiring readmission for postnatal obstetric or neonatal care during the period of self-isolation due to suspected or confirmed COVID-19 are advised to phone ahead to contact their local unit and follow the attendance protocol as described in section 4.1. The place of admission will depend on the level of care required for mother or baby.

**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 confirmed COVID-19 illness

Scheduled antenatal care that falls within the self-isolation period should be re-arranged for after the period of isolation ends. No additional tests are necessary.

Even if a woman has previously tested negative for COVID-19, if she re-presents with symptoms, COVID-19 should be suspected.

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

Further antenatal care should be arranged after the period of self-isolation for acute illness ends.

Referral to antenatal ultrasound services for fetal growth surveillance is recommended, 14 days following resolution of acute illness. Although there isn't yet evidence 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.²⁸⁻²⁹

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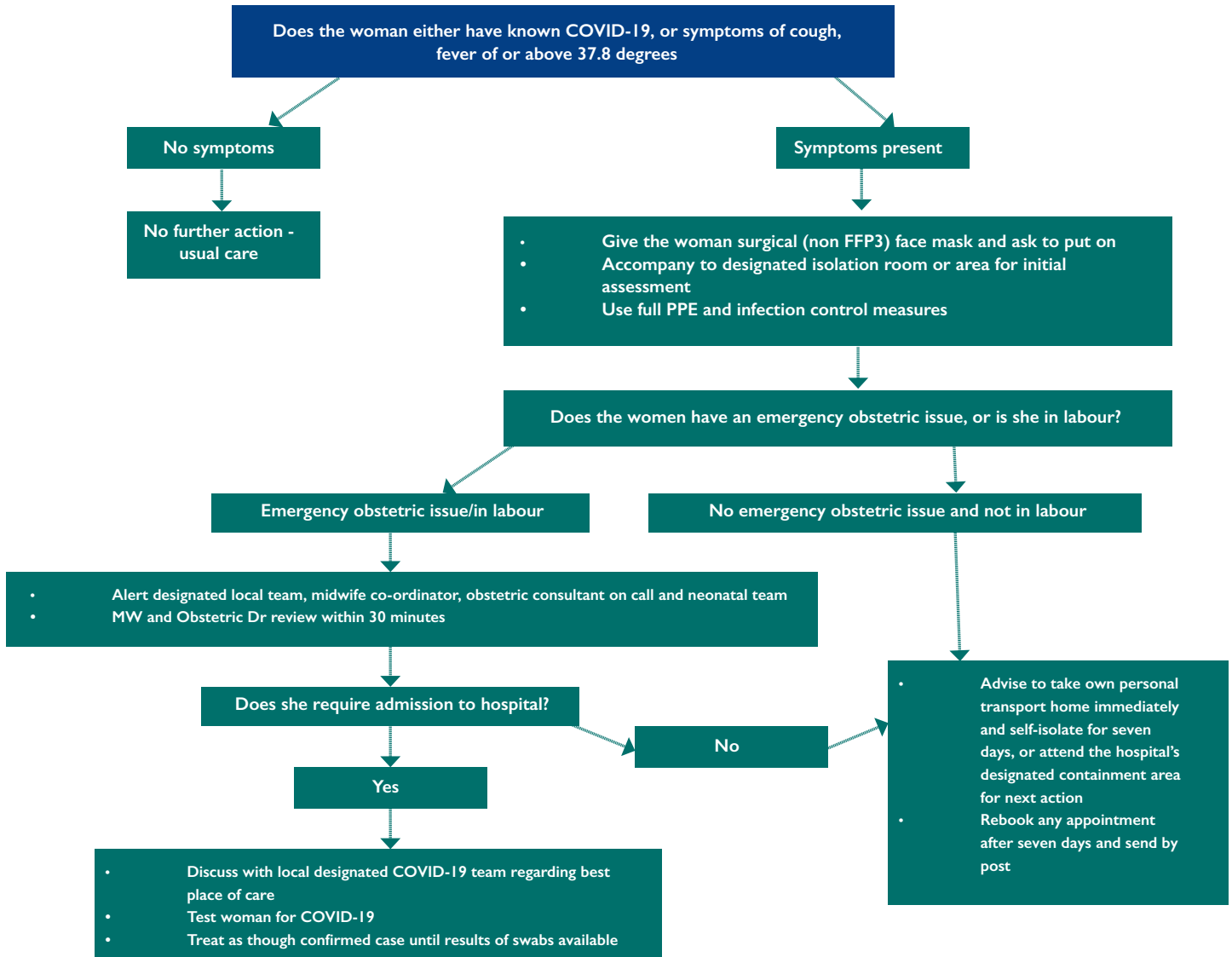
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Flow chart to assess COVID-19 risk in maternity unit attendees

Derived from Royal London flowchart developed by Dr Misha Moore



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