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Guidelines

Clinical Management of COVID19 during Pregnancy

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Background

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2). The outbreak started in December 2019 from Wuhan, China, and declared a global health emergency by World Health Organization (WHO) on January 30, 2020. Coronaviruses are enveloped, positive single-stranded large RNA viruses that infect humans, but also a wide range of animals. Due to the presence of projections on their surface, which resembles solar corona, the virus was named as Coronavirus (Latin corona=crown). COVID-19 spreads through droplets or contact with an infected person and indirectly by touching contaminated surfaces (fomites). According to current estimates, the mean incubation period is 5 days, ranging from 0-24 days with potential of asymptomatic transmission. At this time, there are no specific vaccines or evidence-based treatment for COVID-19. Available evidence suggests that adults with age of ≥ 60 years having an underlying co-morbid (heart disease, chronic obstructive pulmonary disease, diabetes etc.) are at risk of acquiring the severe disease.

This document is intended for clinicians taking care of pregnant women with COVID-19 infection is suspected or confirmed. It is not meant to replace clinical judgment or specialist consultation but rather to strengthen clinical management of these patients and provide to up-to-date guidance. The guidelines have been developed based on what is known about COVID-19 and are subject to change as additional information becomes available.

TRANSMISSION RISK

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: directly from close contact with an infected person (within 2 meters) where respiratory secretions can enter the eyes, mouth, nose or airways - this risk increases the longer someone has close contact with an infected person; and secondly, indirectly by touching a surface, object or the hand of an infected person that has been contaminated with respiratory secretions and then touching one's own mouth, nose, or eyes.

Recently there is a report of the virus found in the Semen of COVID 19 survivors. However, this does not constitute concrete evidence that COVID-19 can be sexually transmitted[1]. COVID 19 virus has been detected in peritoneal fluid at a higher concentration than in respiratory tract[2].

Pregnant women are at the same risk to contract the infection as the general population. Pregnancy alters the body's immune system and response to viral infections, which can be related to more severe symptoms. Emerging evidence now suggests that **vertical transmission** is possible although previous case reports from China suggested otherwise. Amniotic fluid, cord blood, neonatal throat swabs, placenta swabs, genital fluid and breast milk samples from COVID-19 infected mothers have so far, all tested negative for the virus. There are recent reports of 2 infants born to COVID-19 positive mothers, who were also found to have SARS-COV-2 IgM in serum at birth. As IgM does not cross placenta, this represents a neonatal immune response to in utero infection. The evidence above is based on limited case numbers.

[1] https://www.webmd.com/lung/news/20200507/virus-found-in-semen-of-covid-19-survivors#1.
[2] https://journals.lww.com/annalsofsurgery/Documents/SARS-CoV-2%20is%20present%20in%20peritoneal%20fluid%20in%20COVID-19%20patients.pdf

POSSIBLE EFFECTS OF COVID-19 ON MOTHERS AND FOETUSES

Pregnant women with COVID-19 infection may be asymptomatic or have very mild symptoms. Majority experience only mild or moderate cold/flu like symptoms; cough, fever and shortness of breath may also occur. Pregnancy can be associated with more severe symptoms such as pneumonia and marked hypoxia, especially towards the end of pregnancy. However, individual responses to viral infection are variable. There is significant increase in risk of critical illness in later pregnancy, compared with early pregnancy (like SARS & MERS). In one study, there was an increased risk of preterm delivery for maternal medical indications after 28 weeks' gestation. There have been case reports of women with severe COVID at the time of birth who have required ventilation and extracorporeal membrane oxygenation.

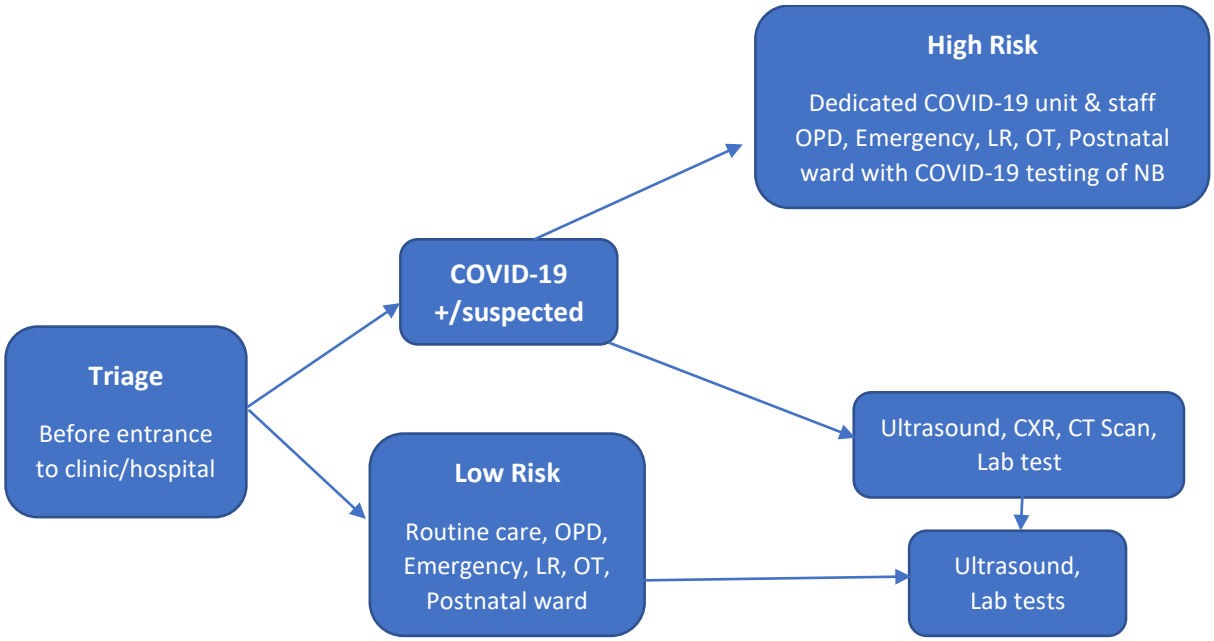
At present there is one published case of a woman with severe COVID-19 who was admitted to hospital at 34 weeks' gestation, had an emergency caesarean section for a stillborn baby and was admitted to the intensive care unit with multiple organ dysfunction and acute respiratory distress syndrome, requiring extracorporeal membrane oxygenation (ECMO). Other reported cases of COVID-19 pneumonia in pregnancy are milder and with good recovery. Only a single case report has been published in scientific literature of a **maternal death and intrauterine foetal death** at 30 weeks' gestation. These deaths, which occurred in Iran, were directly attributed to COVID-19. Besides, there are 9 reported **maternal deaths**, all in the postpartum period (from Iran, Brazil & Mexico).

Two case series recently published by clinicians in New York report that pregnant women showed a **similar pattern of disease severity to non-pregnant adults:** Out of 43 women who tested positive for COVID-19; 86% mild, 9% severe and 5% critical. The second describes results of screening all 215 women who attended maternity units for labour and birth over 2 weeks. Of these, 15.4% of women tested positive for SARS-CoV-2 from naso-pharyngeal swabs. 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. Another report from Intensive Care National Audit and Research Centre, UK, (updated on 10 April 2020), described 3,883 patients admitted to critical care settings with a diagnosis of COVID-19. Ten were pregnant and 13 postpartum. The rate of current/recent pregnancy amongst all individuals admitted to critical care (2.3%) remained 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.

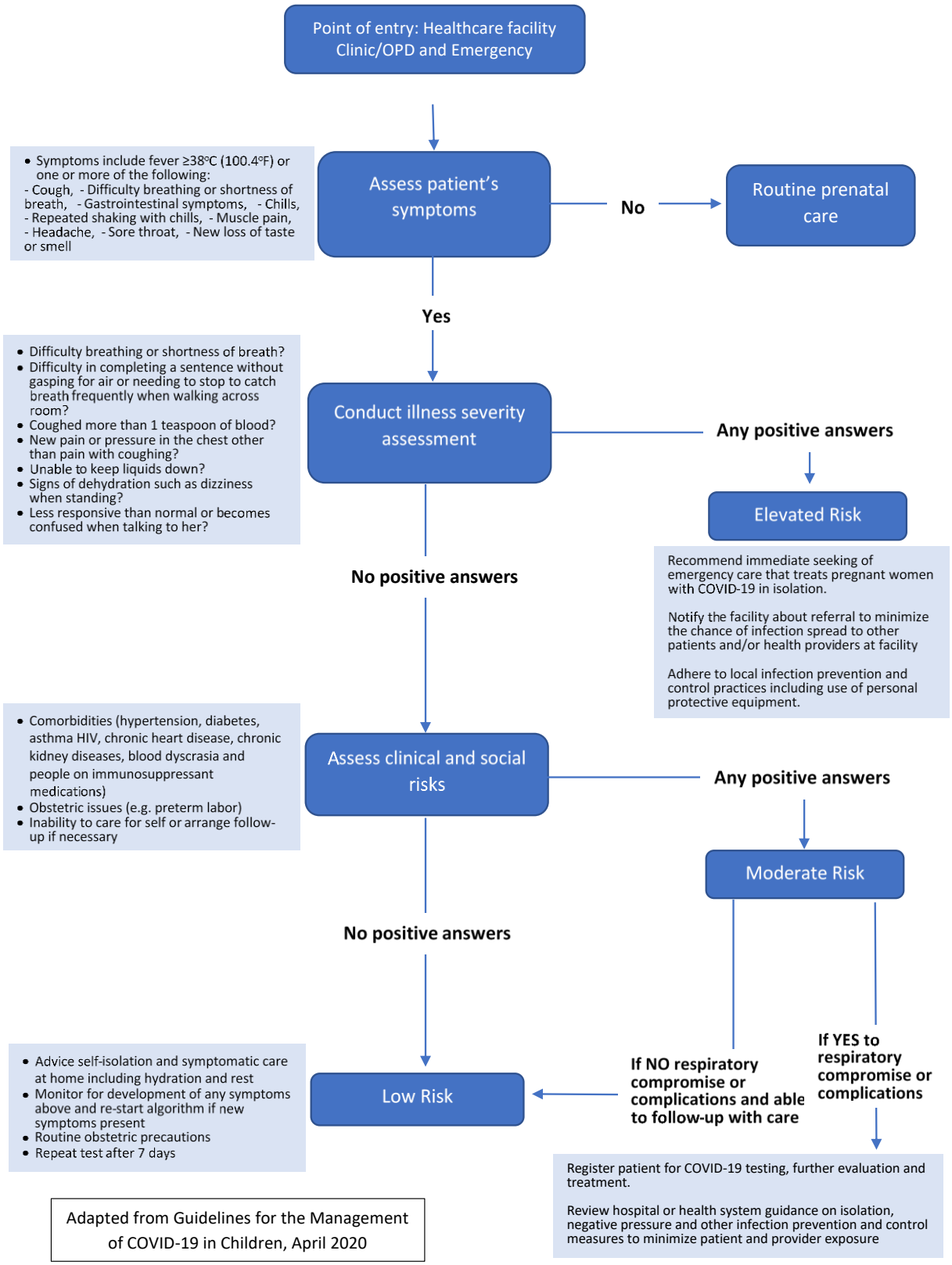
There is no evidence currently that the virus is teratogenic. Recent evidence shows that the virus can be vertically transmitted, although the proportion of pregnancies affected and the significance to the neonate is yet to be determined. There are case reports of **preterm birth** in women with COVID-19, but it is unclear whether the preterm birth was iatrogenic, or spontaneous. Iatrogenic delivery was predominantly for maternal indications related to the viral infection, and foetal compromise and pre labour **preterm rupture** of the membranes in one report.

ORGANIZATION OF GYNAE-OBS PRACTICE

Patient and attendant should wear surgical mask at entrance.



Triage Algorithm for Screening Pregnant Women for COVID-19



Adapted from Guidelines for the Management of COVID-19 in Children, April 2020

Screening Criteria for COVID 19

Clinical Criteria	Epidemiological Criteria
[#]Fever **AND** Cough AND/ OR difficulty in breathing	Absence of any other aetiology that fully explains the clinical presentation **OR**
	*Contact with a confirmed or suspected COVID19 case in the last 14 days prior to onset of symptoms **OR**
	History of attendance of a mass gathering (>50 people) or contact* with a person who has attended a mass gathering **OR** if 2 or more cases of fever and/or respiratory symptoms are reported from small areas such as home gatherings, office or workplace etc.) **OR**
	History of hospitalization in last 14 days prior to presentation **OR**
	Pregnant women with chronic medical conditions and/or an immunocompromised state that may put them at higher risk for poor outcomes (e.g., heart disease, receiving immunosuppressive medications, chronic lung disease, chronic kidney disease)

[#]documented or undocumented

Contact:* *A person living in the same household as a suspected or confirmed COVID-19 case* ***OR* *had direct physical contact with a suspected or confirmed COVID-19 case (e.g. shaking hands)* ***OR*** *having unprotected direct contact with infectious secretions of a suspected or confirmed COVID-19 case (e.g. being coughed on, touching used paper tissues with a bare hand)* ***OR*** *had face-to-face contact with a suspected or confirmed COVID-19 case within 1 meter and > 15 minutes* ***OR*** *who was in a closed environment (e.g. classroom, meeting room, hospital waiting room, etc.) with a suspected or confirmed COVID-19 case for 15 minutes or more and at a distance of less than 1 meter.*

CASE DEFINITIONS

Suspect Case	Meets the clinical and any one of the epidemiological criteria but testing unavailable or results awaited
Confirmed case	Laboratory confirmation of COVID-19 infection by RT-PCR, irrespective of clinical signs and symptoms

Laboratory Investigations

(Follow strict isolation precautions while taking samples)

- RT-PCR for COVID-19 on a nasopharyngeal specimen or oropharyngeal specimen. Nasal specimens can also be taken. In ventilated patients, bronchoalveolar lavage or tracheal aspirates are preferred.
- CBC
- ESR/CRP
- Chest X-ray (CT-chest may be considered in ventilated patients depending on clinical condition and availability)
- Electrolytes, BUN, serum creatinine, Liver function tests
- LDH, Lactate, Ferritin in severe illness
- ECG, Cardiac enzymes if clinically indicated
- Blood cultures and any other relevant cultures to rule out secondary bacterial infection

PROGNOSTIC MARKERS

Test	Result	Comments
WCC	Normal	N:L ratio >3 poor prognosis
Lymphocytes	Low	Low in 80% of cases
Platelets	Mildly Low	<100 poor prognosis
CRP	High	>125 poor prognosis
Troponin	High	Poor prognosis. Not MI-ECG
Urea/Creatinine	Mildly High	AKI usually mild
CPK	High	Rhabdomyolysis may contribute to renal failure late in disease
AST/ALT	High	5 times normal, transient, no fulminant hepatitis, rise day 14
Ferritin	High	Not always

Admission Criteria of Suspected or Confirmed Cases of COVID-19

COVID-19 is suspected or confirmed AND any of the following criteria present?	
Symptoms and signs of pneumonia	YES /NO
Any general danger signs/complications of pregnancy	YES /NO
Need of supplementary oxygen or oxygen saturation <95% on room air?	YES /NO
Radiological confirmed pneumonia	YES /NO
If YES to any of the above, admission is advised	
On chemotherapy	YES /NO
Known secondary immunodeficiency (HIV)	YES /NO
Diagnosed primary immunodeficiency	YES /NO
Underlying co-morbid condition (Diabetes, CKD)	YES /NO
If YES to any of the above in a suspected or confirmed case of COVID-19, decision to admit is based on severity of the underlying disorder	
In NO to ALL of the above in a suspected or confirmed case of COVID-19 admission is NOT advised *	

**In all suspected cases where testing is not possible and above criteria are absent, we do NOT recommend admission, given that isolation procedures at home or isolation facility are available*

CATEGORIZATION AND MANAGEMENT OF CONFIRMED COVID-19 CASES

Case	Definition
Asymptomatic	A confirmed case (Nasopharyngeal RT- PCR is positive for SARS CoV2) having no clinical signs and symptoms.
Mild	A confirmed case with non-specific upper respiratory tract infections (low-grade fever, runny nose, cough) with no radiological signs of pneumonia.
Moderate	A confirmed case with fever and cough/difficulty in breathing without any danger signs; having the radiological evidence of pneumonia requiring hospitalization with or without the need of oxygen support.
Severe	A confirmed case with fever and cough/difficulty in breathing having at least one *danger sign together with radiological evidence of pneumonia **AND/OR** sepsis/septic shock, respiratory failure/ARDS, multiple organ dysfunction (MOD)

**Danger signs: (severe dehydration, decrease in conscious level/unconsciousness, central cyanosis, grunting, convulsions, SpO2<92% on room air, signs of heart failure/myocarditis or signs of shock).*

Asymptomatic COVID-19 Case

Home isolation for 14 days after assessing the residential setting **OR** isolation in dedicated government centres as appropriate.
Educate the patient about symptoms and encourage reporting if any new symptoms develop or worsening of symptoms is noticed (report on dedicated helpline #).

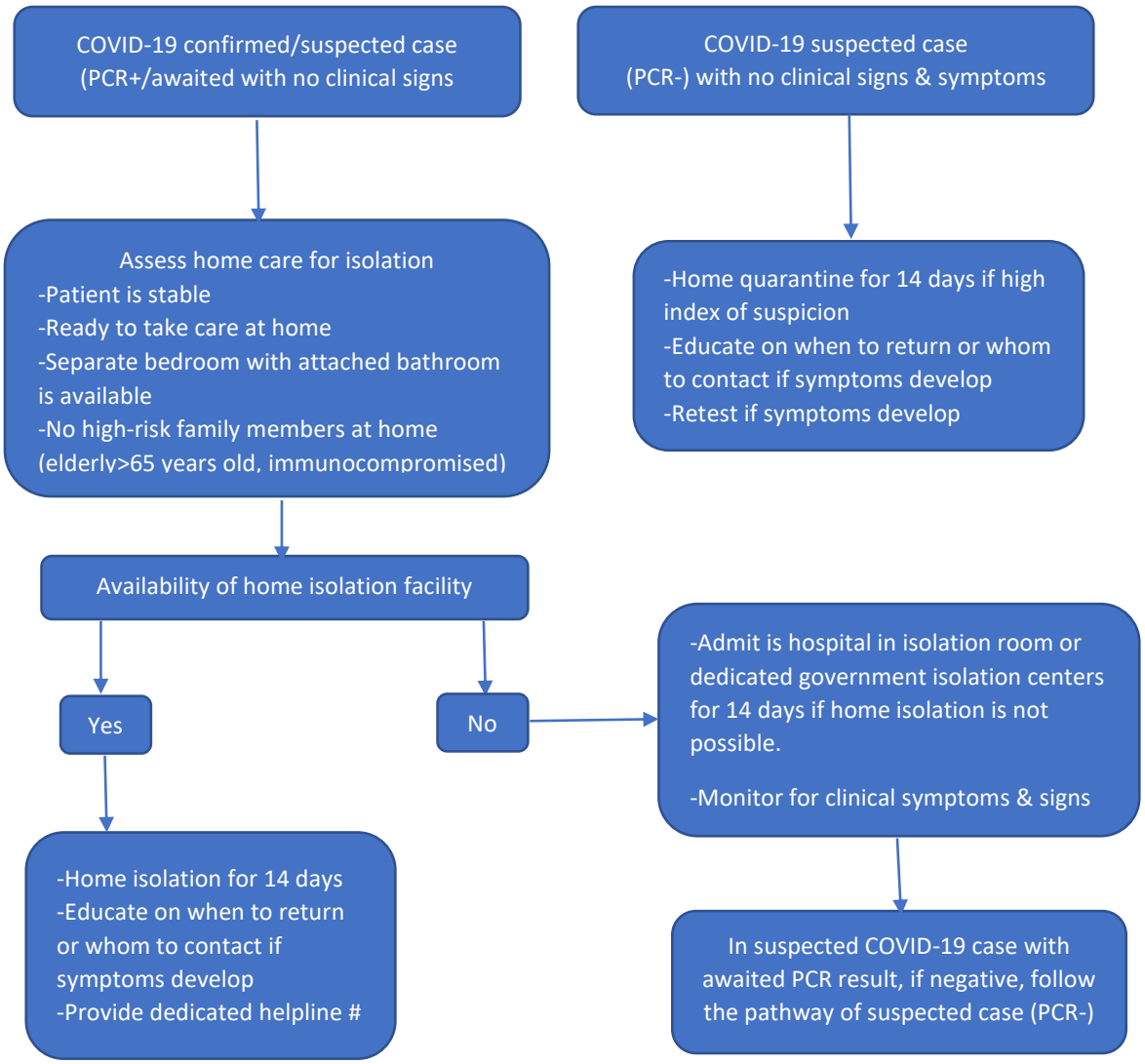
Difference between isolation and quarantine:

Isolation *is used to separate ill persons who have a communicable disease from those who are healthy.*

Quarantine *is used to separate and restrict the movement of well person who may have been exposed to a communicable disease to see if they become ill.*

Refer to the algorithm below for details.

Algorithm for Management of Asymptomatic Cases



Home care

Household members should stay in another room or be separated from the patient as much as possible.
Prohibit visitors at home.
Minimize exposure with pets.
Make sure that shared spaces in the home have good airflow.
Patient should wear a facemask if around people.
https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-home-care.html

Mild-Moderate COVID-19 Case

Description	Mild case (suspected or confirmed)	Moderate Case
Placement	Prefer home isolation after assessing home situation (separate room + attached bathroom) Admit in hospital or refer to a dedicated government isolation centre (depending upon the bed availability) only when home isolation is not possible. If admitting, follow isolation procedures as for moderate cases.	Refer/admit in single room isolation or confirmed cases of COVID 19 can be cohorted together, keep a distance of 1 meter between beds. Contact and Droplet precautions
***Investigation**	CBC, Blood culture and Chest X-ray Testing depends on availability	CBC, Blood culture, CRP, Chest X-Ray, SGPT are recommended Where available, BUN, Cr, electrolytes should also be done Other investigations based on requirement **(Repeat tests if clinically indicated or any worsening of symptoms.** **Rule out co-infections, if fever persists)** Rule out H1N1 if available
**Additional tests as per physician's discretion in cases with immunocompromised status and chronic co-morbidities*		
Treatment	-Hydration (preferably orally) -Paracetamol for fever (avoid NSAIDS) - Antihistamines	-Intravenous hydration until stable to tolerate orally -Paracetamol for fever (avoid NSAIDS) - Normal saline nasal drops ± nebulization **(if needed under strict airborne precautions)** - Antihistamines -Antibiotics (ampicillin, ceftriaxone, azithromycin) for secondary bacterial infections (escalate on clinical worsening if needed). - Oseltamivir if H1N1 is positive
Points to remember **1. Can consider broader spectrum antibiotics in immunocompromised cases and with chronic co-morbidities at physician's discretion**		

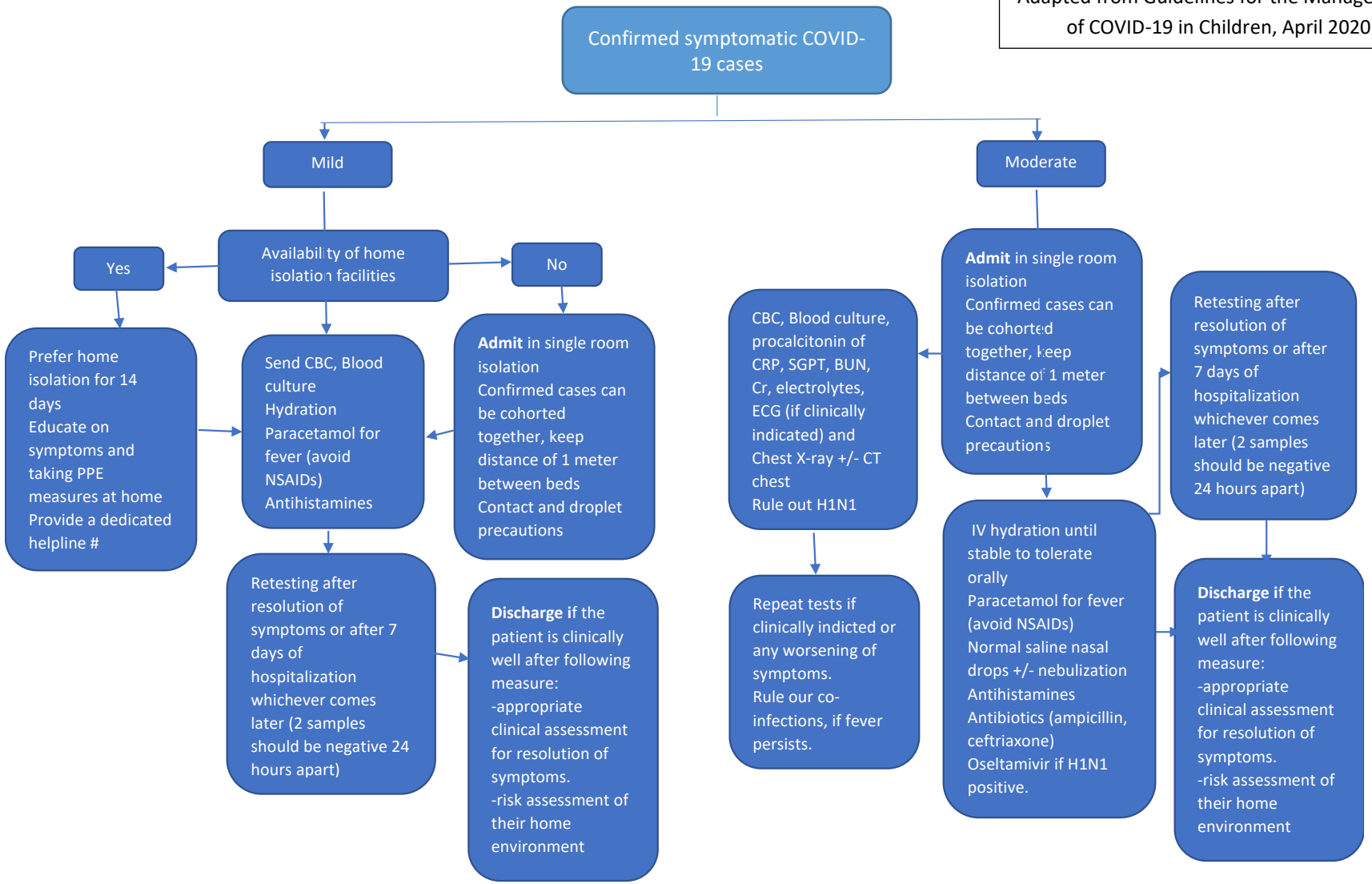
2. Caregiver/Health care provider should wear PPE as suggested by the institution while taking care of COVID-19 patients or performing aerosol generating procedures like nebulization, steam inhalation, suctioning etc.	
Discharge criteria	Patient is clinically well and suitable for discharge from hospital as follows: • Appropriate clinical assessment shows resolution of symptoms and • Risk assessment of home environment indicates ability to isolate and there is acceptance of advice about staying at home for 2 weeks of illness or resolution of symptoms whichever comes later If no arrangements at home, then keep the pregnant woman for 14 days in isolation in hospital or refer to a dedicated government isolation centre. **(Discharge for cases with immunocompromised status or chronic co-morbidities depends upon severity of underlying illness and at the physician's discretion.**

For details on clinical management, also refer to the Clinical Management Guidelines for COVID-19 Infections issued by Ministry of NHSR&C, Government of Pakistan on 2 April 2020.

Refer to the algorithm below for step-by-step guidance on management of mild to moderate COVID-19 cases.

Algorithm for Management of Mild to Moderate COVID-19 Cases

Adapted from Guidelines for the Management of COVID-19 in Children, April 2020



Severe COVID-19 cases or with Acute Respiratory Distress Syndrome

Placement	Investigations	Treatment	Discharge Criteria
Admit the patient to airborne isolation with strict PPE in high dependency unit/intensive care units.	CBC, blood culture & other relevant cultures, CRP, lactate, renal function, liver functions, electrolytes, ABGs, coagulation profile, ECG and Chest X-ray and CT – chest. Rule out H1N1	Airway management and *oxygen therapy (HIGH FLOW BY FACE MASK) ± mechanical ventilation (CONSIDER EARLY) during resuscitation to target SpO2 ≥ 92% Strict Vitals and I/O monitoring Use I/V hydration conservatively until no evidence of shock. Paracetamol for fever (avoid NSAIDS) Give empiric antimicrobials to treat suspected bacterial infections (based on local epidemiology and susceptibility patterns) ***In addition to the above supportive measures, consider the following if no contra-indications (preferably early in the course of illness ≤12th day) after COVID confirmation.*** Oseltamivir (when there is ongoing local circulation of seasonal influenza or H1N1 is positive) **AND** Chloroquine phosphate *For complicated cases (with septic shock, renal failure , liver failure , cardiac failure or Multi-organ failure etc. follow the standard WHO guidelines available at (http://www.ptpol.pl/images/koronawirus/WHO-2019-nCoV-clinical-2020-eng.pdf)*	1.Retesting after resolution of symptoms or after 7 days of hospitalization whichever comes later (2 samples should be negative 24 hours apart) 2. If the patient is clinically well and suitable for discharge from hospital, they can be discharged after: •Appropriate clinical assessment for resolution of symptoms. •Risk assessment of their home environment and provision of advice about staying at home ***(Discharge for cases with immunocompromised status and with chronic co-morbidities depend upon the severity of underlying illness and at the physician's discretion)***

** There is limited evidence on use of Lopinavir/ritonavir (LPV/r), chloroquine phosphate, hydroxychloroquine, interferon therapy, remdisivir and other investigational drug for the treatment of COVID-19. They are under consideration and their use varies from region to region.*

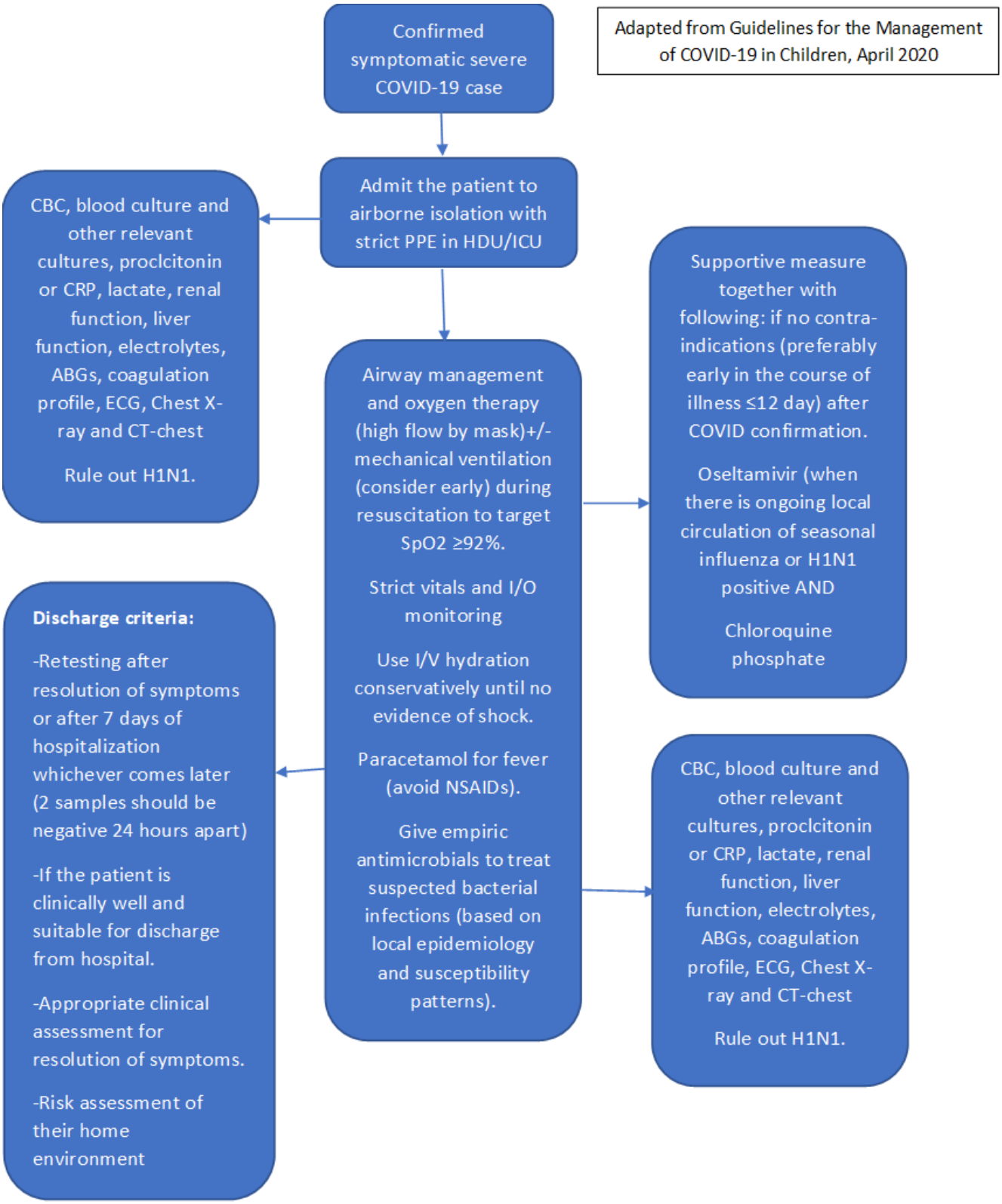
Avoid the use of systemic corticosteroids for treatment of COVID-19 pneumonia outside of clinical trials unless they are indicated for another reason like septic shock (not responding to fluid therapy and vasopressors) or asthma. It may delay the viral shedding or may result in complications (9).

Due to uncertainty around the potential for aerosolization, nebulization, HFO, NIV, including bubble CPAP, can be used with strict airborne precautions.

Dosage of chloroquine phosphate is based on antimalarial dosing schedule.

Avoid the use of azithromycin for the treatment of COVID-19.

Refer to the algorithm below for details



Antenatal Care

Pregnant 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. If women do not attend antenatal services they are at increased risk of maternal death, stillbirth, and other adverse perinatal outcomes.

It is advisable that G/O units should rapidly seek to adopt teleconferencing and videoconferencing capability and consider what appointments can be conducted remotely.

Appointments can be conducted on the phone or using videoconferencing, provided there is no need for physical examination or tests required. Clinicians should co-ordinate care for women who miss appointments due to self-isolation. Women should notify their doctor/hospital, of their self-isolation through phone. Appointments should then be reviewed for urgency and either converted to telephone consultation or attendance in clinic. Vaccination for tetanus toxoid for all women needs to be ensured during antenatal period.

Record keeping is essential. Electronic record systems should be used if possible, 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. A standardized case reporting form is now available for recording and reporting COVID-19 in pregnancy cases. It is important to use the standardized reporting form so that data can be compiled and a complete picture of how COVID-19 has affected pregnant women and new-borns can be made available.

Personal Protective Equipment for Outpatient Clinics

-Gown (sterile cloth reusable gown or disposable gown or disposable plastic apron)
-Gloves (clean disposable gloves)
-Surgical mask
-Goggles or face shield
-Cap (optional)
-Wash hands with soap after each patient or use disinfectant gel if not using gloves
-Wear no jewelry, watches, no dopatta/scarf

ANC FOR SUSPECTED OR CONFIRMED COVID-19 CASES

Routine appointments for women with suspected or confirmed COVID-19 (growth scans, OGTT, antenatal appointments) should be delayed until after the recommended period of self-isolation. Even if a woman has previously tested negative for COVID-19, if she re-presents with symptoms, COVID-19 should be suspected.

Advice to attend more urgent pre-arranged appointments (foetal medicine surveillance, high risk maternal secondary care) will require a senior decision on need & potential risks/benefits. If it is deemed that obstetric care cannot be delayed until after the recommended period of isolation, IPC measures should be arranged locally to facilitate care. Pregnant women in self-isolation who need to attend should be contacted to re-book urgent appointments / scans, preferably at the end of clinic.

Referral to antenatal ultrasound services for foetal growth surveillance is recommended, 14 days following resolution of acute illness. Ultrasound follow-up as necessary to monitor for foetal growth restriction. If ultrasound equipment is used, it should be decontaminated after use.

COVID-19 TESTING

Clinicians should work with their state and local health departments to coordinate testing through public health laboratories, or to work with clinical or commercial laboratories. Pregnant women admitted with suspected COVID-19 or who develop symptoms suggestive of COVID-19 during admission should be prioritized for testing. Because of the potential for asymptomatic patients presenting to labour and delivery units, particularly in high prevalence areas, additional testing strategies may be appropriate.

CARE OF PREGNANT WOMEN WITH CONFIRMED COVID-19 AND ODERATE/SEVERE SYMPTOMS ADMITTED ANTENATALLY

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, Nurse/midwife-in-charge and consultant anaesthetist should be arranged as soon as possible following admission to discuss the below:

- 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 stabilize the woman's condition with standard supportive care therapies.

Intrapartum Care with Current Suspected/Confirmed COVID-19

In pregnant women with suspected or confirmed COVID-19 infection, home delivery is not advised. Intrapartum services at healthcare facilities should be provided with minimum staffing, and the ability to provide emergency obstetric, anaesthetic, and neonatal care.
Women should be allowed to have one birth attendant/support person present with them during labour and birth, unless the birth occurs under general anaesthetic. Restrict any visitors to antenatal or postnatal wards and prevent swapping and postnatal visitors strictly.
All women should be asked to call her doctor or the maternity unit for advice in early labour. She should come to hospital for birth, where the baby can be monitored using continuous CTG monitoring.
Once in hospital she should be shifted directly to an isolation room, a full maternal and fetal assessment should be conducted
Once admitted the following members of the multi-disciplinary team should be informed: consultant obstetrician, consultant anaesthetist, Nurse-in-charge, consultant neonatologist, neonatal nurse in charge and infection control team.

- Assessment of the severity of COVID-19 symptoms
- Start Prophylactic Anticoagulation (see below)
- Maternal observations including temperature, respiratory rate and oxygen saturations.
- Confirmation of the onset of labour
- Electronic foetal monitoring using cardiotocograph (CTG) or intermittent auscultation of FHR after each contraction if CTG/Doppler not available

In two Chinese case series, including a total of 18 pregnant women infected with COVID-19 and babies (one set of twins), there were 8 reported cases of foetal compromise. Given this relatively high rate of foetal compromise, continuous electronic foetal monitoring in labour is currently recommended for all women with COVID-19.
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 (e.g. difficulty in breathing).
If labour is confirmed, then care in labour should continue in the same isolation room.

CARE IN LABOUR – NORMAL DELIVERY

Minimize the number of staff entering the room and obstetric units should develop a local policy specifying essential personnel for emergency scenarios. Asymptomatic birth attendant should be asked to wash hands frequently and wear a mask. (Symptomatic, birth attendants should remain in self isolation and not come to hospital at all.)
Ensure continuous CTG monitoring in labour. Maternal observations and assessment should be as per standard practice, with hourly oxygen saturations.

- Aim to keep oxygen saturation >94%, titrating oxygen therapy accordingly
- Give Oxygen via mask not nasal prongs

If the woman has signs of sepsis, investigate, and treat as per guidance on sepsis in pregnancy, but also consider active COVID-19 as a cause of sepsis and investigate accordingly.
Mode of birth should be discussed with the woman, taking into consideration her preferences and any obstetric indications for intervention. It 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 second stage of labour should be shortened with elective instrumental birth in a symptomatic woman who is becoming exhausted or hypoxic.
Delayed cord clamping is recommended following birth, provided there are no other contraindications. The baby can be cleaned and dried as normal, while the cord is still intact.

EMERGENCY CAESAREAN SECTION

Epidural or spinal analgesia or anaesthesia can be given in the presence of coronaviruses. Epidural analgesia should also be recommended to minimise the need for general anaesthesia if urgent delivery is needed. Entonox (Nitrous Oxide/Oxygen) is not an aerosol-generating procedure (AGP), so it can be used with a single-patient microbiological filter.
In case of deterioration of symptoms, make an individual assessment regarding the risks and benefits of continuing the labour, versus preceding to emergency caesarean section if this will aid efforts to resuscitate the mother.
When emergency caesarean section or other operative procedure is decided, 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.

ELECTIVE CAESAREAN SECTION

Where women with suspected or confirmed COVID-19 are due for elective caesarean section, an individual assessment should be made to determine whether it is safe to delay it to minimise the risk of infectious transmission to other women, healthcare workers and, during postnatal period to her infant.
In cases where it cannot safely be delayed, the general advice for services providing care to women admitted when affected by suspected/confirmed COVID-19 should be followed
Obstetric management of elective caesarean section should be according to usual practice.

Personal Protective Equipment for C-section

Gown (disposable or reusable sterile cloth gown with disposable plastic mackintosh underneath)
Sterile Gloves (double gloves for surgeon in COVID 19 positive)
Surgical mask covering N95 mask (for re-use)
Goggles or face shield
cap
Shoe covers/ waterproof shoes/boots

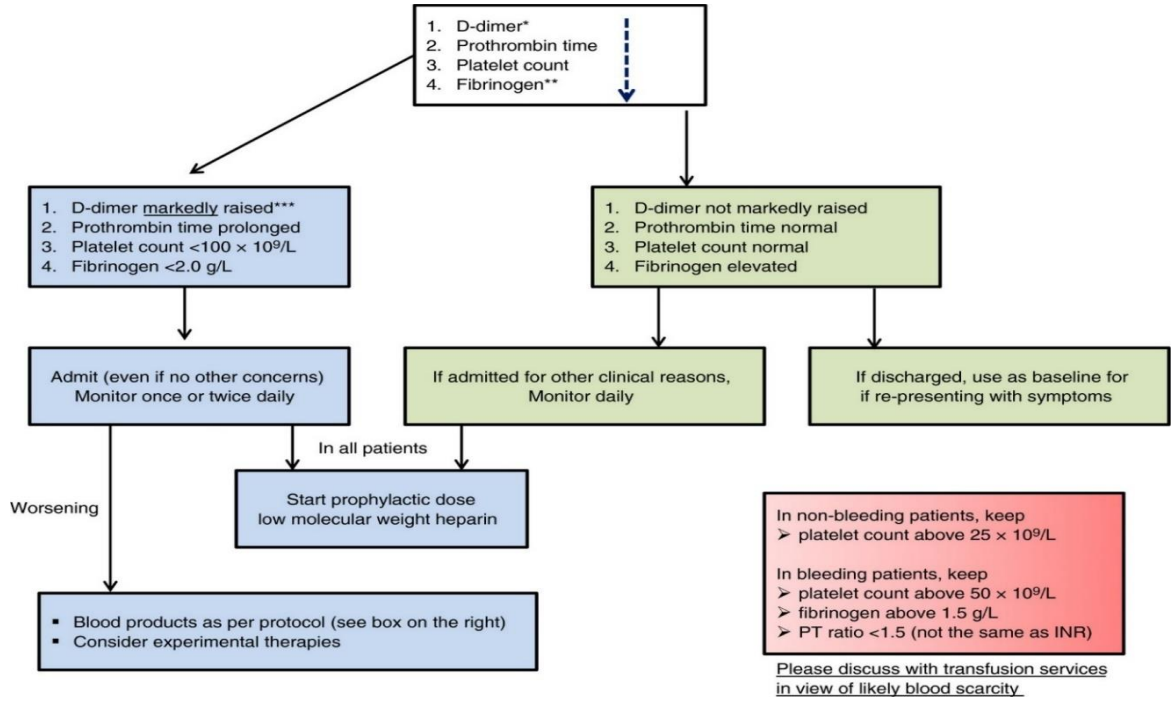
PLANNED INDUCTION OF LABOUR

An individual assessment should be made regarding the urgency of planned delivery. Women and their families should be told about possible delay.

THROMBOPROPHYLAXIS

Individuals admitted to hospital with COVID-19 are in a hypercoagulable state, so infection with COVID-19 is likely to be associated with an increased risk of venous-thromboembolism. Reduced mobility from self-isolation at home, or hospital admission, is likely to increase the risk further. LMWH should be started on diagnosis and stopped 12 hours before delivery, when possible. Following birth, LMWH should be administered as soon as possible after birth, provided there is no PPH 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. Stop after 10 days post-partum.
The International Society of Thrombosis and Haemostasis has generated a simple algorithm for the management of COVID-19 coagulopathy.
A coagulation profile to detect the presence of subclinical disseminated intravascular coagulation and the use of low-molecular-weight heparin for the prevention of thromboembolic disorders should be considered and discussed with physicians and patients. Anticoagulant treatment with low-molecular-weight heparin has been associated with improved prognosis in patients with severe COVID-19 infection, stratified by sepsis-induced coagulopathy score or D-dimer results[3].

Based on the currently available literature, we would recommend measuring D-dimers, prothrombin time, and platelet count (in decreasing order of importance) in all patients who present with COVID-19 infection. This may help in stratifying patients who may need admission and close monitoring. Any underlying condition (e.g., liver disease) or medication (e.g., anticoagulants) which may alter the parameters should be accounted for while using the algorithm below[4].



[3] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7175884/
[4] https://onlinelibrary.wiley.com/doi/full/10.1111/jth.14810

Neonatal care and Breastfeeding

Considering current limited evidence, and in line with WHO recommendations, it is advisable that women and healthy infants are kept together in the immediate post-partum period with infection prevention measures. In addition, skin-to-skin care for all new-borns and Kangaroo mother care for preterm and low birth weight new-borns born to COVID-19 positive or suspected mothers is also recommended. A risks / benefits discussion with neonatologists and families to individualise care in babies who may be more susceptible is recommended.
In six Chinese cases tested, breastmilk was negative for COVID-19; however, this limited evidence should be interpreted with caution. 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 or another care giver, should they be infected, should be discussed with the parents. The following 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.
- Wearing a face mask, while feeding or caring for the baby.
- Considering asking someone who is well to feed the baby.
- Strict adherence to sterilization for bottle feeding with formula or expressed milk.
- If mothers are expressing breast milk in hospital, a dedicated breast pump should be used and must follow recommendations for pump cleaning after each use.
- Keep observation for 24-48 hours following improvement in mother's condition.

For management of new-borns, refer to the guidelines for clinical management of COVID-19 in children April 2020 (PPA, UNICEF, WHO) and management guidelines for the neonate of suspected or confirmed COVID-19 mothers issued by M/o NHSR&C on 6 April 2020[5].

MANAGEMENT OF CASES WITH UNCONFIRMED COVID-19 BUT SYMPTOMS SUGGESTIVE OF INFECTION

Maternity/ Obstetrics 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 takes a seat in the maternity waiting area. Also refer to the Clinical Management Guidelines for COVID-19 Infections issued by Ministry of NHSR&C on 2 April 2020[6]

If a woman meets the criteria for COVID-19, she should be tested. Until test results are available, she should be treated as though she has confirmed COVID-19.

Pregnant women may attend hospital for reasons related to pregnancy and have coincidental symptoms meeting the 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 emergency, investigate and treat as suspected COVID-19 until advice can be sought.

[5] http://www.nhsrc.gov.pk/Detail/NWYyMzg2MGMtM2ZmOC00YThlLTgyZmMtN2QxYTZjMjE3YzQz
[6] http://www.nhsrc.gov.pk/Detail/NWYyMzg2MGMtM2ZmOC00YThlLTgyZmMtN2QxYTZjMjE3YzQz

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

MANAGEMENT OF CASES WITH CONFIRMED COVID-19 WHO ARE ADMITTED TO CRITICAL CARE

Women with moderate-severe symptoms of COVID-19 should be monitored using hourly fluid input-output charts, towards achieving neutral fluid balance in labour, and avoid fluid overload.
Hourly observations should be maintained, monitoring both the absolute values and the trends. Titrate oxygen to keep saturations >94% and keep hourly record of respiratory rate looking for the rate and trends. Young fit women can compensate for a deterioration in respiratory function and are able to maintain normal oxygen saturations before they then suddenly decompensate. So, a rise in the respiratory rate, even if the saturations are normal, may indicate a deterioration in respiratory function and should be managed by starting or increasing oxygen.
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 foetal concerns. Abdominal shielding can be used to protect the foetus as per normal protocols.
Consider additional investigations to rule out differential diagnoses, e.g. ECG, CTPA as appropriate, echocardiogram. Do not assume all pyrexia is due to COVID-19 and perform full sepsis 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. Try boluses in volumes of 250-500mls and then assess for fluid overload before proceeding with further fluid resuscitation.
The frequency and suitability of foetal heart rate monitoring should be considered on an individual basis, taking into consideration the gestational age of the foetus and the maternal condition. If urgent delivery is indicated for foetal 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 foetal condition. Individual assessment should consider the maternal condition, the foetal condition, the potential for improvement following elective birth and the gestation of the pregnancy. The priority must always be the wellbeing of the mother.
WHO recommends antenatal corticosteroid therapy for women at risk of preterm birth from 24 to 34 weeks of gestation when there is no clinical evidence of maternal infection, and adequate childbirth and new-born care is available. However, in cases where the woman presents with mild COVID-19, the clinical benefits of antenatal corticosteroid might outweigh the risks of potential harm to the mother. In this situation, the balance of benefits and harms for the woman and the preterm new-born should be discussed with the woman to ensure an informed decision, as this assessment may vary depending on the woman's clinical condition, her wishes and that of her family, and available health care resources

Prophylactic Anticoagulation must be started, and urgent delivery should not be delayed for their administration. There are some reports that even after a period of improvement there can be a rapid deterioration.
The neonatal team should be informed of planned delivery of a woman affected by COVID-19, to allow them to don PPE before entering the room/or operating theatre. An individualised decision should also be made regarding mode of delivery. Caesarean section should be performed if indicated based on maternal and foetal condition as in normal practice and in line with WHO global guidance.

Gynaecology Services and Procedures

The risk of generating contaminated aerosols may potentially be lower with laparotomy. With the current few data, there is no evidence of an increased risk of COVID-19 transmission during gynaecological laparoscopic surgery when Personal Protective Equipment (PPE) is used. COVID-19 has been found in faeces presumably through transmission from the naso-pharynx with ingestion into the gastrointestinal tract (29% of cases) and in blood samples in approximately 1% of cases. Thus, operations involving the bowel may have different implications than in gynaecology. Laparoscopic surgery is associated with reduced morbidity, shorter hospital stays and quicker return to daily activities, all of which will benefit the patient, and make better use of hospital resources, particularly at the time of the current pandemic.
In the absence of evidence that COVID-19 transmission is increased by the generation of contaminated aerosols during gynaecological laparoscopic surgery, the BSGE recommends the following:

- All theatre staff should use PPE during all operations under general anaesthetic whether by laparoscopy or laparotomy and infection control practices should be followed, as determined by local and national protocol.
- Non-surgical methods of treatment should be actively recommended to reduce the risk of COVID19 transmission to health care workers, and reduce the need for hospital admission, provided they are a safe alternative (for example but not limited to methotrexate for unruptured ectopic pregnancy).
- Gynaecological operations that carry a risk of bowel involvement, however small (for example but not limited to tubo-ovarian abscess), should be performed by laparotomy. Elective gynaecological operations that have a risk of bowel involvement should be deferred. For other gynaecological laparoscopic operations (for example but not limited to ruptured ectopic pregnancy, ovarian cyst accident) the port positioning and instrument choice should be according to the surgeon and hospitals usual practice to minimise time in theatre and the risk of operative complications.

Suction devices, smoke evacuation filters, retrieval devices and swabs should be used to prevent aerosol/droplet transmission. remove smoke, aerosol and the CO2 pneumoperitoneum during operations to prevent potential droplet transmission. Avoid explosive dispersion of body fluids when removing trocars and retrieving specimens. There is a high risk of explosive dispersion of body fluid when the uterus is removed from the vagina at total laparoscopic hysterectomy. Consideration should be given to performing an open hysterectomy, on a case by case basis. Only evacuate surgical smoke via the tap on ports when attached to a smoke evacuation filter and / or by direct suction using a vacuum suction unit. Only evacuate the pneumoperitoneum via direct suction using a vacuum suction unit.

Early Pregnancy Abortion, Post-Abortion Care & Contraception Services

There are currently no data suggesting an increased risk of **miscarriage** or early pregnancy loss in relation to COVID-19. While managing such cases, the aim should be to minimise COVID-19 exposure for women and staff.

- Maximise the use of remote consultations (e.g. via video or telephone) to deliver pre- and post-abortion care and assessment. Self-referral to abortion care is recommended and can be done remotely. Providers should organise early medical abortion services to be delivered via video or teleconferencing and delivery of a treatment package. Providers need to ensure the woman has adequate privacy at the start of any telephone/ video consultation.
- Women who are self-isolating and suitable for an early medical abortion at home should be treated without the need for her to visit in person without delay. At later gestations, providers should explore if assessment can be done as soon as possible in adequate precautions.
- For women requesting an early medical abortion, only require her to attend in person where the benefit of doing so outweighs the risk of COVID-19 exposure and transmission. For therapeutic medical abortion, provide a further dose of misoprostol 400 micrograms for use if abortion has not occurred after 3–4 hours, especially where gestation is likely to be over 8 weeks. If given for 10–12 weeks gestation, use 800 micrograms as either a single second dose or two further 400-microgram doses.
- Ensure the woman has adequate analgesia (e.g. paracetamol) and offer additional analgesia (avoid NSAIDs) if requested.
- Provide post abortion care without routine pre-procedure ultrasound and blood testing. If screening for sexually transmitted infections (STIs) is required, offer this remotely (e.g. home testing service) when possible. Offer discussion of contraception options – if appropriate include contraception in pack with MA.
- Routine pre-abortion ultrasound scanning for gestational age determination is unnecessary. Even if U/S needed to exclude ectopic pregnancy, abortion can be performed without definitive evidence of an intrauterine pregnancy.
- A history and symptom-based approach, with an ultrasound if indicated, is appropriate for the diagnosis and management of miscarriage and ectopic pregnancy. Other studies have provided evidence that early medical abortion can be safely provided remotely up to 70 days' gestation and beyond.

Indications for undertaking an ultrasound before abortion in the first trimester include:

- If a woman is unable to provide a LMP of reasonable certainty to be able to offer care within thresholds of eligibility or skill (e.g. 10 weeks for an early medical abortion under current regulations, 14 weeks for a vacuum aspiration)
- History or symptoms suggestive of a high risk of an ectopic pregnancy, for example:
- Presence of unilateral abdominal pain and vaginal bleeding / spotting which could indicate an ectopic pregnancy
    - An intra-uterine device in situ.
    - Prior ectopic pregnancy
    - History of tubal damage or surgical sterilization.

If a woman has already had an ultrasound, providers should accept the report from other services provided they meet standards of scanning, and not repeat the scan unnecessarily.

- Routine blood tests such as full blood count or testing for haemoglobinopathies are not recommended as pre-abortion assessment and should only be considered if there are specific clinical concerns. It is not cost-effective or necessary to 'group and save' for women undergoing induced abortion.
- Determination of rhesus status (RhD) is not required before early medical abortion. For surgical abortion, NICE guidance recommends this after 10 weeks but only to "consider" determining RhD status under 10 weeks. If having to check RhD status would require an additional visit for the woman, it could be omitted if the risk from COVID-19 outweighs the benefit of receiving anti-D immunoglobulin. If RhD testing would require additional contact in women up to 12+6 weeks of gestation requiring a surgical or medical abortion, the need to minimize contact to reduce the risk of COVID-19 transmission may outweigh any benefit from having anti-D. Recent data from flow cytometry suggest that foeto-maternal haemorrhage in early pregnancy is less than had been supposed, especially where sharp curettage is not used in surgical procedures. A small study found that of 42 women having a surgical uterine evacuation, none had levels of foetal cells sufficient to cause isoimmunization.
- The NICE guidance on miscarriage states that anti-D is not required for medical management of missed miscarriage up to 13 completed weeks (13+6). Anti-D is more likely to be beneficial in later gestations, in young women who are likely to desire pregnancies in the future, and where there would be no delay to their care by testing. In contrast, for same-day procedures where aspiration is used, especially at earlier gestations and where the woman considers her family complete, an assessment may conclude that anti-D is not warranted. If a woman at any gestation is certain that she has competed childbearing and understands the risks of not receiving anti-D then there is no benefit in testing.
- If a screen for STIs is indicated (or a chlamydia screen recommended as per the national screening programme best practice), a web-based home testing service offers the best solution, although availability will vary.

Emergency Contraception & Contraception after Abortion

Hormonal tablets (upto72 hrs)

- Combined oral contraceptive pills (4 + 4 tabs 12 hrs apart)
- Progestogen only pills (levonorgestrel 150 mg stat, ECP)

Intrauterine Contraceptive Device (up to 5 days)
Contraception after Abortion:

- All modern contraceptives can be safely used after abortion
- IUCD (Cu-T, Multiload, Levonorgestrel IUS (Mirena) can all be inserted immediately after MVA uterine evacuation, (or D & C)
- After MA, IUCD can be inserted after completion of abortion on a follow-up visit
- Implant can be inserted immediately after MVA or at the time of administration of Medication abortion (Misoprostol)
- COCP & Injectable hormones can be started on same day of MVA/MA

Post-Partum Contraception

Ensure that the woman is discharged home with a contraceptive method of her choice, as follow will be difficult. PPIUCD & hormone implants (LARCS) can be inserted immediately after delivery and other methods discussed and provided with instructions before discharge

Infertility Treatment & ART

Due to COVID- 19 pandemic couples are currently being discouraged to have a baby. However, this is a sensitive topic for infertile couples so approach the topic gently. Focus on lifestyle changes like exercise, folic acid supplementation and preliminary infertility testing
In general, the data on pregnancy outcomes, although reassuring, only report small numbers and must be interpreted with caution. Reports mainly refer to infection in the third trimester. There is no information on the possible effect of COVID-19 infection on pregnancies in initial stages.
Assisted reproduction treatments should not be started at present:

- To avoid complications from assisted reproduction treatment and pregnancy
- To avoid potential SARS-CoV-2 related complications during pregnancy
- To mitigate the unknown risk of vertical transmission in SARS-CoV-2 positive patients
- To support the necessary reallocation of healthcare resources
- To observe the current recommendations of social distancing.

In cases of urgent fertility preservation in oncology patients, the cryopreservation of gametes, embryos or tissue should still be considered. For those patients having started assisted reproduction treatment at the present time, elective oocyte or embryo freezing for later embryo transfer (freeze-all) is recommended.

Any risk of viral contamination to gametes and embryos in the IVF laboratory, either from infected patients or professionals, is likely to be minimal (if at all) because the repeated washing steps required for the culture and freezing protocols will result in a high dilution of any possible contaminants. Even with no specific data available, it is assumed that sperm, oocytes and embryos are unlikely to be infected. Furthermore, the zona pellucida represents a high level of protection for oocytes and embryos. Regardless of the biological details, it is prudent to defer all elective fertility-promoting medical procedures, primarily to maintain social distancing and protect any and all medical resources.

Healthcare professionals and clinics should remain available to provide supportive care , psychological support and clinical advice to their patients, preferably via online consultation.
An up-to-date overview of data extracted from all published reports on pregnancy and neonatal outcomes in women with confirmed COVID-19 is available from the Cochrane Gynaecology and Fertility Group[7].

Ultrasound Scans

Requests for ultrasound scans should be minimized and reserved for emergency and essential requests, otherwise postpone for 2 to 4 weeks. There is increased risk for contracting COVID-19 infection for the staff performing ultrasound scans due to proximity to patients.

[7] https://cgf.cochrane.org/news/covid-19-coronavirus-disease-fertility-and-pregnancy

Rationalizing the Obstetric Ultrasound scans during COVID-19 pandemic		
Elective (Low risk) Can be delayed/postponed	**Urgent/Semi Elective (Moderate risk) to schedule within 2-3 weeks**	**Emergency (High risk)- To be done without delay within 24 hrs**
Low risk patient: First trimester scan. Combine dating & NT scan	Advanced maternal age Diabetes/Hypertensive Gynaecological malignancies	Abdominal pain (ectopic, ovarian cyst torsion/rupture etc) and bleeding in any trimester
Offer non-invasive prenatal testing if symptomatic or late NT	Raised NT or NIPT result	Pre-eclampsia Ovarian hyperstimulation syndrome
Detailed anomaly scan (18-22 weeks). Rescan in 3-4 weeks instead of 1-2 week.	Invasive procedures for genetic or structural reasons Abnormal uterine bleeding Post coital bleeding	Fetal growth restriction Post-menopausal bleeding
In symptomatic cases, scan can be arranged after isolation period is over.	Foetal growth restriction and foetal anaemia	Monochronic twins with TTTS/selective FGR
Both NT and anomaly scan have a window period so can be adjusted easily	Multifetal gestation	Foetal structural abnormalities/ foetal anaemia
Perform anomaly scan at 22 weeks or those with BMI>40 (to eliminate the need to call again)	COVID-19 patients for anomaly scan after isolation is over.	COVID-19 hospitalized patients Postop/post procedure complications

Common Indications of foetal growth scans & their frequency during the pandemic				
Indication	**Once**	**4 weeks**	**4-6 weeks**	**Comments**
Advanced maternal age (>35 years)	√			
Pre-gestational diabetes			√	DM before pregnancy
Gestational diabetes 1 (GDM 1)			√	Well controlled
Gestational diabetes 2 (GDM 2)		√		Poorly controlled
Prior history of stillbirth/FGR/SGA			√	
Current IUGR (growth<10th centile)		√		More frequent with doppler changes (1-2 weeks)
Monochronic diamniotic twins		√		Can be repeated in 2-3 weeks for TTTS/ selective FGR
Monochronic monoamniotic twins		√		
Dichorionic twins		√		
Placental localization*	√			34-36 weeks
Serial growth scans start from 28 weeks onwards. In low risk, one scan can be done at 32 weeks, can be repeated at 35 weeks by individualizing the patients. (Adapted & Modified MFM Guidance ACOG 2020)				

Personal protective equipment for ultrasound operators during COVID-19 pandemic			
PPE	**Asymptomatic & TOCC negative**	**Asymptomatic & TOCC positive**	**Suspected/probable COVID-19 patient & in high transmission areas**
Clothing	Dedicated work clothes	Dedicated work clothes	Dedicated work clothes
Hand hygiene	Yes	Yes	Yes
Surgical face mask	Yes	Respirator (N95, FF2)	Respirator (N95, FF2)
Respirator	No	Respirator (N95, FF2)	Respirator (N95, FF2)
Isolation gown	No	Disposable fluid resistant /impermeable	Disposable fluid resistant /impermeable
Disposable gloves	Yes	Yes (two pairs)	Yes (two pairs)
Eye protection	No	Goggles/ face shield	Goggles/ face shield
Hair cover	No	Yes	Yes

Managing Deceased Pregnant Women

The safety and well-being of everyone who tends to bodies should be the first priority. Before attending to a body, people should ensure that the necessary hand hygiene and personal protective equipment (PPE) supplies are available [8]

Increased Risk of Violence for Women

As distancing measures are put in place and people are encouraged to stay at home, the risk of intimate partner violence is likely to increase. Stress, the disruption of social and protective networks, and decreased access to services can all exacerbate the risk of violence for women.

The likelihood that women in an abusive relationship and their children will be exposed to violence is dramatically increased, as family members spend more time in close contact and families cope with additional stress and potential economic or job losses. Women may have less contact with family and friends who may provide support and protection from violence. Women bear the brunt of increased care work during this pandemic. School closures further exacerbate this burden and place more stress on them. The disruption of livelihoods and ability to earn a living, including for women (many of whom are informal wage workers), will decrease access to basic needs and services, increasing stress on families, with the potential to exacerbate conflicts and violence. As resources become scarcer, women may be at greater risk for experiencing economic abuse. Perpetrators of abuse may use restrictions due to COVID-19 to exercise power and control over their partners to further reduce access to services, help, and psychosocial support from both formal and informal networks. Perpetrators may also restrict access to necessary items such as soap and hand sanitizer. Perpetrators may exert control by spreading misinformation about the disease and stigmatize partners.

Access to vital sexual and reproductive health services, including for women subjected to violence, will likely become more limited. Other services, such as hotlines, crisis centres, shelters, legal aid, and protection services may also be scaled back, further reducing access to the few sources of help that women in abusive relationships might have.

Health systems have an important role in ensuring that services for women who have experienced violence remain accessible during the COVID-19 outbreak Although COVID-19 has placed an immense burden on the health systems and health workers in caring for the sick, there are things that can help mitigate the impacts of violence on women and children during this time:

All stakeholders involved in the COVID-19 response need to raise awareness of the potential effects that physical distancing, stay at home and other measures are likely to have on women who are subjected to violence and their children.

• Health workers, the majority of whom are women in many settings, may be at risk for violence in their homes or in the workplace. The latter is a serious problem that may be exacerbated when health systems are under stress. Health managers or facility administrators need to have plans to address the safety of their health workers. Front-line providers dealing with COVID-19 might experience stigmatization, isolation, and being socially ostracized. Provisions for psychosocial support, non-performance-based incentives, additional transport allowance, and child-care support should be planned[9].

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[8] For Management of the dead body Refer to:

- World Health Organization. (2020). Water, sanitation, hygiene, and waste management for the COVID-19 virus. Interim guidance: 19 March 2020.
- Pan American Health Organization. Leadership during a pandemic: What your municipality can do. Tool 18: Management of dead bodies.
-M/oNHSRC guidelines on burial and safe management for handling of dead body and the guidelines for air transport of COVID positive dead body issued on 6 May 2020.

[9] https://apps.who.int/iris/bitstream/handle/10665/331699/WHO-SRH-20.04-eng.pdf?ua=1 accessed 9.5.20

Infection Prevention and Control and Use of Personal Protective Equipment

GENERAL PREVENTIVE MEASURES FOR COVID 19

Currently there is no vaccine available to prevent coronavirus disease 2019 (COVID-19). The best way to prevent COVID-19 is to avoid being exposed to this virus. We can limit the transmission of virus by taking everyday preventive measures by:

1.	Staying at home when sick. Do not send the sick child to school.
2.	Caregiver and a child should wear a facemask only if the child has symptoms particularly when you/your child are around other people (e.g., sharing a room or vehicle) and before you/your child enter a healthcare provider's office/facility
3.	Covering mouth and nose with flexed elbow or tissue when coughing or sneezing. Dispose of used tissue instantly.
4.	Washing hands often with soap and water or a sanitizer whichever is available
5.	Avoid touching your eyes, nose, and mouth with unwashed hands.
6.	Cleaning frequently high-touched surfaces (tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, sinks etc.) by detergents and disinfectants.
7.	Avoid going to crowded places like shopping malls, restaurants, public parks etc.

**Little is known about the COVID-19 being the novel disease. As we learn, more about COVID-19 public health officials may recommend additional actions.*

Steps of hand washing

If you are using soap and water, follow following steps:

1. Wet hands with safe running water
2. Apply enough soap to cover wet hands
3. Scrub all surfaces of the hands – including backs of hands, between fingers and under nails – for at least 20 seconds. This is similar to singing the ABC song at a normal tempo or the happy birthday song twice.
4. Rinse thoroughly with running water
5. Dry hands with a clean, dry cloth, single-use towel, or hand drier as available

If you are using a hand sanitizer, ensure that it contains at least 60% alcohol, use enough to cover all surfaces of your hands, and rub them together until they feel dry.

It is better to clean hands more often. Additional key time points to clean hands include

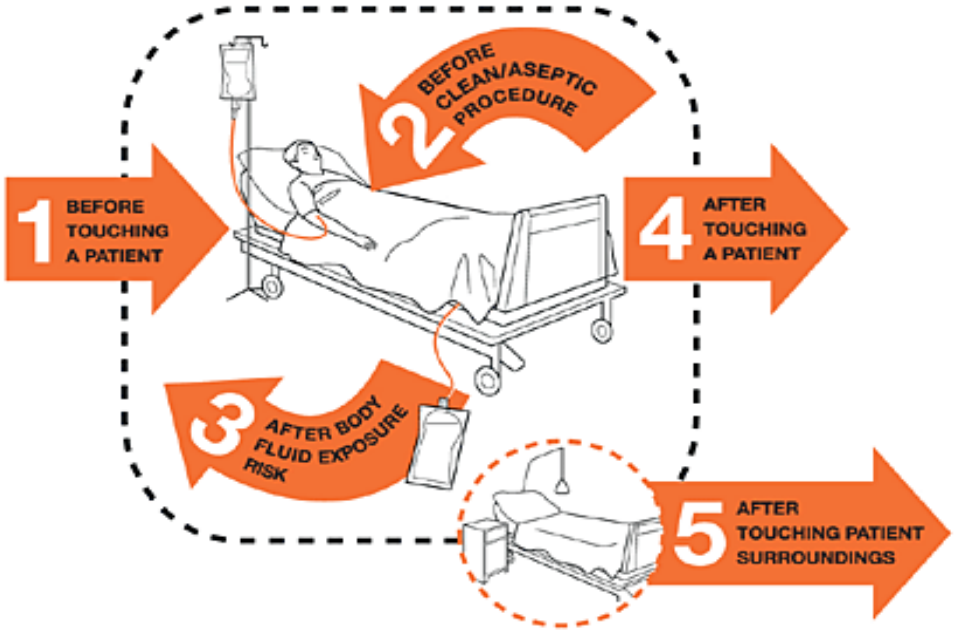
- After blowing one's nose, coughing, or sneezing

- After using the restroom/toilet
- Before eating or preparing food
- After contact with animals or pets
- Before and after providing routine care for another person who needs assistance (e.g. a child)

CLEAN AND DISINFECT HOUSEHOLD HIGH-TOUCHED SURFACES

For a home-based preparation for cleaning and disinfection, prepare a bleach solution by mixing: 5 tablespoons (1/3rd cup) bleach per gallon of water or 4 teaspoons bleach per quart of water. This solution can be used for cleaning and disinfecting surfaces within households.

HANDWASHING ADVICE FOR HEALTH PROVIDERS



Details available at (https://www.who.int/infection-prevention/campaigns/clean-hands/5moments/en/)

LEVELS OF PROTECTION FOR HEALTH CARE WORKERS

This is a generic guidance, where available please adhere to your institutional rules

Protection Level	Protective Equipment	Scope of Application

Level 1 protection	• Disposable surgical cap • Disposable surgical mask • Work uniform • Disposable latex gloves and/or disposable isolation clothing if necessary	• Pre-examination triage, general OPD
Level 2 protection	• Disposable surgical cap • Medical protective mask (N95) • Work uniform • Disposable medical protective uniform • Disposable latex gloves • Goggles	• Fever OPD • Isolation ward area (including isolated ICU) • Non-respiratory specimen examination of suspected /confirmed patients • Imaging examination of suspected/confirmed patients • Cleaning of surgical instruments used with suspected/confirmed patients.
Level 3 protection	• Disposable surgical cap • Medical protective mask (N95) • Work uniform • Disposable medical protective uniform • Disposable latex gloves • Full face respiratory protective devices or powered air purifying respirators	• When the staff performs operations such as tracheal intubation, tracheotomy, bronchofibroscope, gastroenterological endoscope, etc. during which the suspected/confirmed patients may spray or plash respiratory secretions or body fluids/blood. • When the staff performs surgery and autopsy for confirmed/ suspected patients • When the staff carries out NAT for COVID-19

AEROSOL GENERATING PROCEDURES

- Intubation, extubation and related procedures e.g. manual ventilation and open suctioning.
- Tracheotomy/tracheostomy procedures (insertion/open suctioning/removal)
- Bronchoscopy.
- Surgery and post-mortem procedures involving high-speed devices.
- Some dental procedures (e.g. high-speed drilling).
- Non-invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP).
- High-Frequency Oscillating Ventilation (HFOV)
- Induction of sputum
- High flow nasal oxygen (HFNO) use mask instead in labouring women

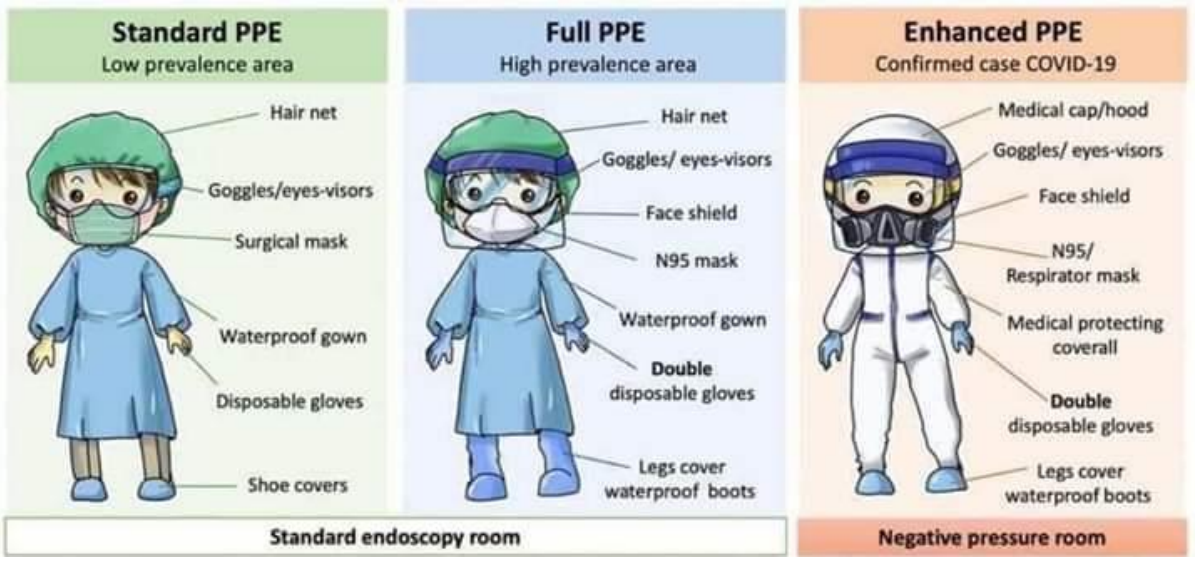
Chest compressions and defibrillation (as part of resuscitation) are not considered AGPs; but for COVID 19 patients they are. Resuscitation should be carried out only if wearing AGP PPE for patients with suspected/confirmed COVID-19. CPR should be carried out in a single room with the doors shut. Only those healthcare staff who are needed to undertake the procedure should be present. A disposable, fluid repellent surgical gown, gloves, eye protection and a FFP3 respirator should be worn by those undertaking the procedure and those in the room.

Certain other procedures/equipment may generate an aerosol from material other than patient secretions but are not considered to represent a significant infectious risk. They include:

- Administration of pressurized humidified oxygen.
- Administration of medication via nebulization.

During nebulization, the aerosol derives from a non-patient source (the fluid in the nebulizer chamber) and does not carry patient-derived viral particles. Staff should use appropriate hand hygiene when helping patients to remove nebulizers and oxygen masks.

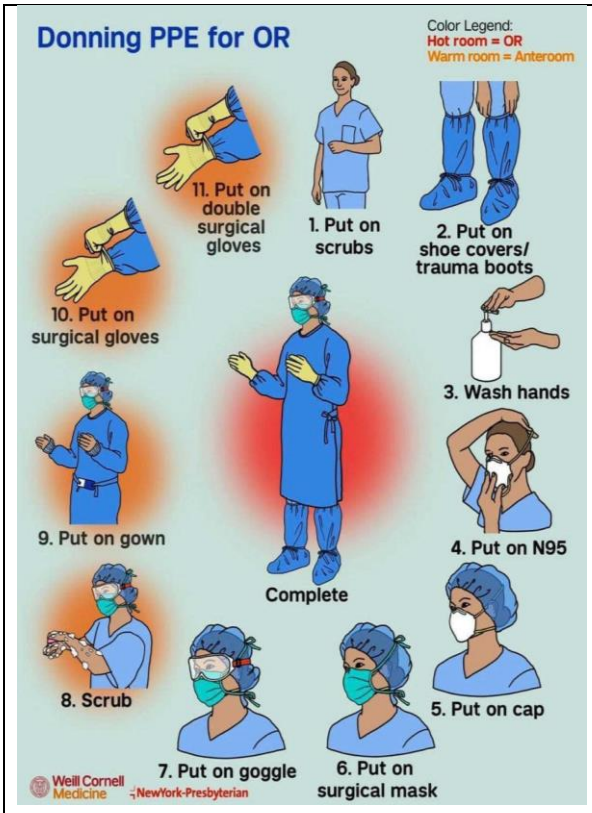
When to use PPEs

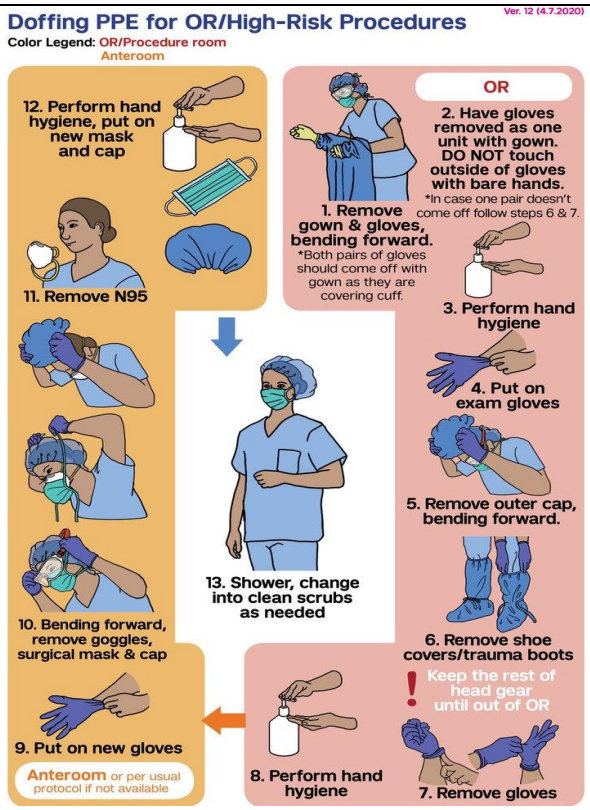


When caring for patients with suspected or confirmed COVID-19, all healthcare workers need to – prior to any patient interaction – assess the infectious risk posed to themselves and wear the appropriate personal protective equipment (PPE) to minimize that risk.

If an aerosol generating procedure is performed on a confirmed or suspected COVID-19 patient, an N95 mask should be worn with the face shield.
Faculty and staff are discouraged from stockpiling personal protective equipment (PPE) and they should not take PPE home.
Face shield should be used in all patient encounters when you are within 6 feet of the patient. The purpose is to protect your eyes, nose, and mouth from infectious droplets. **The face shield is to be worn in the place of a face mask.** It provides better coverage of your face and has the added benefit of keeping you from touching your face.

Always perform hand hygiene before donning and before doffing to minimize contaminating the device. Refer to the national guidelines on infection prevention and control 2020 for details.





Note: The above recommendations are being regularly reviewed by the Ministry of National Health Services, Regulations & Coordination and will be updated based on the international & national recommendations and best practices.

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