GUIDELINES FOR ANTENATAL, INTRANATAL, POSTNATAL & NEWBORN MANAGEMENT OF COVID-19

Version 1.0, 24th July 2020
Render My Service for #FightAgainstCorona

I resolve, that I shall render my service to the nation when called upon to do so. I shall abide by all Government directions relating to Lockdown, Quarantine, Isolation or any other instructions and advisories for protecting my nation and my fellow citizens & strengthen the #FightAgainstCorona. I shall act responsibly in fulfilling my duty and inspire others also to do so.

#ItsMyDuty

2858835353

Shubham Yadav
Signature

June, 22 2020
Disclaimer:
The guidelines in this document are based on limited evidence as available now. As new evidence accumulates, some of the recommendations may change. Users should use these guidelines in accordance with the latest government regulations and ICMR advisories. Modifications at the individual institutional level may be needed in case of non-availability of resources – infrastructure, manpower & equipment. Organizations & Government and their staff make no representation or guarantee that these compilations of information are error free and only the main author take responsibility for the images & information used. Used some images and charts from many journals only with the intention of Academics and teaching all, during this COVID-19 pandemic, for the benefit of humankind. Some minor changes have been made in few images as per local guidelines. Thankyou with Courtesy for all the Authors and Image designers.

THIS GUIDELINE HAS BEEN PREPARED ON JULY 24TH 2020

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Message from the Honourable Chief Minister, Karnataka

I am immensely pleased to learn that the National Neonatology Forum’s Karnataka State Chapter has taken initiative to create SOP and training for SNCU during Covid-19 pandemic for the management of mother and baby.

Government of Karnataka is taking all necessary steps to combat the Covid-19 virus. The most important factor in preventing the spread of the virus is to empower the citizens, doctors, healthcare workers with right information, training and following the guidelines issued by the Ministry of Health and Family welfare.

I assure you that Government of Karnataka will extend all necessary support to the initiative.

(B.S.YEDIYURAPPA)

Dr. Kotturesh,
President,
National Neonatology Forum,
Karnataka State Chapter
MESSAGE

The Coronavirus outbreak has posed serious challenges to India’s healthcare community. The protection of children and educational facilities is particularly important. Precautions are necessary to prevent the potential spread of COVID-19 in community and healthcare settings, however, adequate training and information about COVID-19 pandemic can avoid stigmatizing doctors, nurses and healthcare workers who may have been exposed to the virus. It is important to remember that COVID-19 does not differentiate between borders, ethnicities, disability status, age or gender. Education and training settings should continue to be welcoming and sterile environments to all to be provided. I am extremely happy that, NNF Karnataka along with UNICEF India has come forward to create SOP for the SNCU’S OF KARNATAKA, FOR THE ANTENATAL, NATAL AND POSTNATAL management of mother and baby during COVID-19 PANDEMIC. We understand that along with SOP BOOKLET, NNF Karnataka and UNICEF is planning to undertake training all the SNCU’S nursing staff and doctors towards to it. We extend our complete support for this noble cause. Our Best wishes for organising team of NNFK office and UNICEF.

(Dr. ASHWATH NARAYAN C.N)
MESSAGE

At the outset I am pleased to know that the National Neonatology Forum’s Karnataka State Chapter has taken initiative to create SOP and training for SNCU during COVID-19 pandemic for the management of mother and baby.

NNF has in association with UNICEF, IMA, IAP, BPS and Senior obstetricians, prepared the Guidelines for Antenatal, Intranatal, Postnatal and Newborn Management of COVID-19. This document has comprehensively addressed aspects pertaining to care of pregnancy and new born during the pandemic scenario. It is extremely heartening and reassuring to learn that NNF has also endeavored to train the care-providers.

On behalf of Health Ministry, Government of Karnataka I congratulate NNF and also extend my whole-hearted support to ensure effective implementation of these guidelines at the earliest. Once again, let let me thank every healthcare professional behind this venture for sparing their valuable time and energy during these testing times. I am sure that our next generation will be safe in your hands.

Dr KOTTURESHE, President, National Neonatology Forum, KARNATAKA STATE CHAPTER.
Message from the Honourable Medical Education Minister, Karnataka

Ref: MEM/119/2020

Date: 17-07-2020

MESSAGE:

I am pleased to know that National Neonatology Forum, Karnataka State Chapter in association with UNICEF is coming up with Standard Operative Procedures for SNCU’s during COVID-19 pandemic.

The Novel Corona Virus outbreak has posed serious challenges to India’s healthcare community. The resilience, hope and compassion are the need of the hour. The National Neonatology Forum is working vigorously in analyzing data, providing advice, coordinate with related partners, helping, preparing and managing expert networks for the welfare and care of mother and the babies.

I appreciate selfless work by the medical fraternity. The entire team had put a lot of hard work to assimilate all the evidence and bring this SOP and plan to train all the nurses and doctors across the State of Karnataka for easy management of COVID-19 pandemic.

I congratulate and extend my warmest wishes for their remarkable work to the mankind. I wish good luck in all their future endeavours.

(DR. K. SUDHAKAR) 17/7

To
Dr. H.V. Kotturesh
President
National Neonatology Forum
Karnataka State Chapter
Bengaluru

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
We are faced with an unprecedented situation due to the COVID-19 pandemic in the country. While the healthcare for elective medical and surgical problems has been deferred in the current scenario, childbirths and need of neonatal care continue. Therefore, we need to not only make special arrangements for pregnant mothers and neonates at risk of the Coronavirus infection, but also keep providing essential services especially in the obstetric & neonatal units. The suspected or confirmed COVID-19 women pose unique challenges and care of these mother-baby dyads requires special resources. The neonate not only needs to be provided essential newborn care but also is to be protected from getting infected during delivery and in the post-natal period from mother, possibly exposed family members as well as health care providers.

The threat of Coronavirus infection is not going to disappear soon and in the interest of safety of mothers and their newborn infants, guidance for operationalization of services are urgently needed. These need to be safe and practical for majority of patients while ensuring safety of health care providers.

National Neonatology Forum of India (NNFI) is pleased to note that the State of Karnataka has come out with standard operating procedures (SOP) for management of pregnant mothers & newborn through a process of consultation with professional organizations and academic institutions. This compilation provides guidelines for operationalization of services for pregnant mothers & newborn babies. Detailed flow charts of case management and guidelines approved by the state government provided in the annexures will help in implementation of best practices for Covid infection. Personal protection equipment (PPE) are dealt in detail for safety of healthcare providers. Infection prevention & control (IPC) and biomedical waste disposal in healthcare facility are customized as per National guidelines. These critical interventions should be strictly adhered to for curtailing spread of Covid infection.

NNFI along with the Federation of Obstetric and Gynaecological Societies of India (FOGSI) and Indian Academy of Pediatrics (IAP) has released the Clinical Practice Guidelines on Perinatal-Neonatal management of COVID-19 infection. These guidelines can be adopted and operationalized in the context of locally available resources and local epidemiology of the coronavirus infection.

Policy makers, program managers and members of professional organizations must ensure quality of coverage and implementation of the life-saving interventions during the time of pandemic. I am sure these SOP's will help in providing safe ethical care with dignity, ensuring quality healthcare which is affordable and cost effective.
Message from NNF-K Office

15th July 2020

My Dear Fellow academicians, administrators, co-workers and all
I Dr Kotturesha, President NNF KARNATAKA, with my office bearers of NNF-K thank sincerely UNICEF, Government of Karnataka, IAP Karnataka, Bangalore Pediatric Society (BPS), Indian Medical Association (IMA), Karnataka State Obstetrics & Gynaecology Association (KSOGA), Federation of Obstetrics & Gynaecological Societies of India (FOGSI), Bangalore Society of Obstetrics & Gynaecology (BSOG) and NNF-K for having come together to make this manual possible for the benefit of everyone involved.

I am extremely happy with hard work done by Dr Prashanth Gowda (secretary NNFK), Dr Dinakara Prithviraj (Treasurer), Dr Girija RG, for their immense hardwork and along with the entire NNFK members, to bring this SOP at the shortest time, starting from scratch, and going through all the available evidence, consulting CDC, UNICEF, WHO, ICMR, NNFI & IAP, FOGSI to bring this latest COVID guidelines for SNCU.

We are in a Pandemic, but we are much better prepared than last century – when the Spanish Flu happened, when there was NO information, no antiseptics and no known treatment. Also the last century Spanish Flu was followed by 2 World wars – and economic recession of the century which virtually eliminated human inhabitation. In that sense, we are much better prepared. But we should take this Pandemic as a “warning” to the human kind – and adapt ourselves to the new normal – use only what is required, limit our exposure to wild animals, keep the world for the future generations.

SARS-COV-2 virus causing Covid-19 is behaving differently in each country, whether it is due to mutation or genetic background of the population or other factors like BCG, MMR or nutritional status – we are not sure. The information is changing almost daily with the available information. Dr Kishore Kumar, Our Vice President, was part of the international working group of Neonatologists – which included Prof. Daniele De Luca & Luigi Gagliardi (Italy), Prof. Mikael Norman (Sweden), Prof. Louise Owen, Robert Guaran, Ju Lee Oei & Jeanine Chong (Australia), Prof. Kee Thai (Singapore), Prof. Satoshi Kusuda (Japan), Prof. Neena Modi (UK), Georg Schmoelzer (Canada), among many others – in trying to create a uniform policy for management of Newborn affected with Covid-19. He is well aware of the changing guidelines each day with the available evidence, and we have taken his expertise in preparing this manual.

We have prepared this manual with the current available evidence based information, which may need to be revised periodically as the new information becomes available. For the current state, please use this information which has been collected by the team of experts and hopefully we should come out of this, without much loss to the state or the country.

Once again thank you for everyone who has worked on this both behind the scenes and in many ways.

With sincere regards

SD:
Dr. H V Kotturesha
Rasthapuramath
President
Karnataka State Rajyotsava Awardee

SD:
Dr. R. Kishore Kumar
Vice-President

SD:
Dr. Prashanth Gowda
Secretary

NNF Karnataka State Chapter in collaboration

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Message from IAP Karnataka & Bangalore Paediatric Society (BPS)

WE, IAP KARNATAKA AND IAP BANGALORE BPS, REALLY PROUD THAT GOVERNMENT of Karnataka, NNFK, UNICEF, IAP-BPS, KSOG, BSOG, FOGSI, and IMA together write a manual to manage the Covid in mother and children.

This is very essential when a novel disease strikes the human community, and we are all in a dilemma and confusion of managing those cases.

This manual should give the doctors who are managing such cases a sense of confidence and comfort.

Let us give the people of Karnataka a good hope, assurance, and the vision that we doctors are with them in this hour of crisis and we will lead them from the front.

This manual could be a good reference guide to the post graduates and the under graduates.

With regards
Dr. Shantharaj A
Dr Ravishankara Marpalli
President
Karnataka
IAP Chapter &
IAP BANGALORE BPS

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
Message from
Federation of Obstetrics & Gynaecological Societies of India (FOGSI)

Dr. Alpesh Gandhi
President FOGSI

Dear Colleagues
I hope this message will find you safe and healthy.
With the Covid 19 pandemic taking over our lives we, as the frontline warriors, have had to come to terms with a new normal. The routine ways of interaction and examination that we followed for decades have suddenly been rendered unsafe.
Direct interpersonal communication, which was considered one of the cornerstones of our medical practice, has now been replaced by technology. There is stress and fear amongst patients and the general public. Patient safety has a whole new definition.
Even in this time of uncertainty, however, we - the gynecologists and pediatricians, know that the natural processes of reproduction and neonatal care, cannot be put under a lockdown. It becomes our responsibility then, to lay down the new ground rules for our patients and colleagues, to guide them towards a new way of thinking and working, and to make these processes as safe and stress-free as possible.
I am proud to say that FOGSI was one of the first organizations in India to come up with its own set of GCPR guidelines for diagnosis and management of COVID-19 affected patients in pregnancy and delivery. Building on those recommendations, I applaud the Karnataka NNF and UNICEF for coming up with such a comprehensive set of guidelines for Antenatal, intranatal, postnatal and neonatal management of COVID-19. I am sure these will be of great value and will serve as a quick and easy reference for gynecologists and pediatricians practicing across Karnataka. I also congratulate team KSOGA and Team BSOG for continuing good work and essential health service in this difficult time to serve women of Karnataka.
I wish the difficult time will pass soon, we will have its vaccine and we will win the battle against the biggest health challenge COVID-19 Pandemic as one unit. Till then please take care of yourself, your family members, your staff and your patients.

With kindest regards
Dr Alpesh Gandhi
President, FOGSI

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
Dear Sir/Madam,

As this viral pandemic evolves rapidly, we are committed to doing everything we can to help not only our doctors and healthcare workers, but individuals in our communities. As part of that promise Indian Medical Association, (IMA) Karnataka is showing its solidarity with NNF Karnataka and supporting for the work and protocol for SNCU’S for Management of pregnancy and newborn baby during COVID-19 Pandemic. We continue to urge you to do your part to help "flatten the curve" – stay home – and give our healthcare providers the time to care for those who need it most. Our actions today will dramatically impact the scale of the epidemic tomorrow. This protocol is going to help all the doctors and healthcare workers in handling pregnant mother and baby during this situation. Our heartfelt wishes for NNF Karnataka for this endeavour, we assure that IMA Karnataka will give its complete support in helping our frontline warriors to follow safe process in handling pregnant mother and baby during pandemic.

Thanking You
Yours Sincerely

Dr. Madhusudhana Kariganuru
President
FOREWORD

Dr. K. S. Gautham, MBBS, DCH, MD, DNB, DM, FAAP
Professor of Pediatrics and Section Head of Neonatology, Baylor College of Medicine
Chief of Neonatology, Texas Children’s Hospital, Houston, Texas, USA
Senior Editor, Neonatal Review Group, Cochrane Collaboration
Deputy Editor, The Joint Commission Journal on Quality and Patient Safety
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We are in the middle of an unprecedented event, the covid-19 pandemic, the likes
of which has not been experienced by anyone in modern times. This pandemic has
disrupted societal functioning, the economy, and healthcare all over the world and
in India. Most worrisome of all this pandemic shows no signs of abating, even
months after its commencement. A major challenge for health professionals across
the world and in India is the novelty of the SARS-CoV-2 virus. As the new pathogen
emerged in December 2019, health professionals struggled to understand its
pathophysiology, its biologic effects, and methods of transmission prevention,
diagnosis and treatment of symptomatic patients. Fortunately, today, in July 2020,
we now have a better understanding of the virus and its effects, about how to
prevent its spread, and how to treat infected patients. However, the field of
perinatal care presents its own unique challenges, and knowledge about the effects
of the virus on pregnant patients and their babies is still accumulating. A key
concern during this pandemic is the threats to the physical and mental health of
doctors, nurses and other health professionals from the SARS-CoV-2 virus
infection. Health professionals are at significant risk of getting infected themselves,
both inside the hospital and outside. Many doctors and nurses have died of this
infection and more are dying every day. Thus, prevention of infection of healthcare
workers with proper use of personal protective equipment and other precautions is
one of the highest priorities during this pandemic.

In such challenging times the National Neonatology Forum-Karnataka, in
collaboration with UNICEF and the Government of Karnataka has provided a
valuable service to doctors, hospitals and clinics by creating a set of evidence-based
guidelines and standard operating protocols for prevention and management of
SARS-CoV-2 infections. These SOPS are robust and practical, and provide
extremely useful guidance for front line clinicians as they battle the virus. Most
importantly they provide guidance for avoidance of infection in healthcare workers.
A large team of experts and volunteers has rapidly come together, reviewed the
emerging evidence, customized it to the local context, and worked tirelessly to
quickly create these highly useful SOPs. Indeed, in many ways, these SOPs are
better than the guidelines created by centers in Europe and in the US. The
beneficiaries of these SOPs will be the doctors, nurses and other health
professionals who are on the front lines, in SNCUs, hospitals, and clinics. More
importantly, the babies, their mothers, and their families will hugely benefit from
these SOPs.

My compliments to NNF-Karnataka, UNICEF and the Govt. of Karnataka to the
authors of these SOPs, guidelines and the organizing team for this excellent
contribution to the people of Karnataka and India.
Jai Hind! Jai Karnataka!

SD: Dr. Gautham Suresh

NNF Karnataka State Chapter in collaboration with UNICEF, HFO
We are in the midst of an unprecedented scenario with extraordinary circumstances. RMNCHA services have been severely affected and there is need to focus on the key evidence-based interventions. Special efforts have to be made to continue the essential routine RMNCAH+N services. The COVID 19 outbreak has placed unprecedented demands on our health system. Focusing on COVID 19 related activities, and continuing to provide essential services, is important not only to maintain people’s trust in the health system to deliver essential health services, but also to minimize an increase in morbidity and mortality from other health conditions. Analyses from the 2014-2015 Ebola outbreak suggests that the increased number of deaths caused by measles, malaria, HIV/AIDS and tuberculosis attributable to health system failures exceeded deaths from Ebola.

National Neonatology Forum of India along with the Federation of Obstetric and Gynaecological Societies of India (FOGSI) and Indian Academy of Pediatrics (IAP) has released the Clinical Practice Guidelines on Perinatal-Neonatal management of COVID-19 infection. It is important to adapt the released guidelines to state specific policy and enable implementation.

UNICEF is happy to collaborate with NNF Karnataka, IAP Karnataka, BPS, IMA Karnataka, KSOGA, BSOG, FOGSI & Government of Karnataka to prepare these Updated Standard Operating Procedures & Guidelines for management of sick newborn in SNCUs, tertiary care level & Antenatal, Postnatal, delivery room management. The group of experts have put in their best efforts to prepare a comprehensive module to educate NICU staff & Obstetric colleagues on protocols related to management of sick newborn. It is important to update the information and follow a standard guidelines, SOP based management at all newborn units & delivery care centre.

I congratulate NNF-K, Govt. of Karnataka & Govt. of Telangana for successfully taking up this endeavour and thank my colleague Dr Srikrishna RSV & Mr. Nikhil Herur for coordination.

SD: Dr. Sanjeev Upadhyaya
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Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
EXECUTIVE SUMMARY
INTRODUCTION

• Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus that causes coronavirus disease 2019 (COVID-19).
• Direct person to person contact transmission via respiratory droplet spread is the primary means of transmission.
• Common symptoms include – Fever, Cough, Sore throat, Breathlessness, Headache, loss of smell, myalgia, chest pain, loss of appetite, loss of taste, diarrhoea, abdominal pain, fatigue, confusion.
• Physiological immune system changes in the pregnancy do not render them more susceptible to severe infections, compared to normal population. Most pregnant women will experience only mild or moderate symptoms.
• Currently, there is no data suggesting an increased risk of miscarriage in relation to COVID-19. Recent studies indicate very less neonatal infection within 48 hrs of delivery in COVID positive mothers.
• Risk of vertical transmission is low. Transmission through breast milk is very rare.

COVID-19 IN PREGNANCY

Precautions a pregnant women should take:
• Wash your hands frequently
• Keep space between yourself and others
• Avoid touching your eyes, nose and mouth
• Cough or sneeze into your bent elbow or a tissue

The following pregnant women need testing for COVID-19:
• All symptomatic individuals with history of travel in last 14 days
• All symptomatic contacts of laboratory-confirmed cases
• All symptomatic health care workers with ILI
• All patients with Severe Acute Respiratory Illness (fever and cough and/or shortness of breath)
• Asymptomatic direct and high-risk contacts of a confirmed case should be tested once between day 5 and day 14 of coming in his/her contact in
hotspots/ cluster (as per MoHFW) and in large migration gatherings/ evacuation centers.

• Direct and high risk contact
• Pregnant women residing in clusters/containment area or large migration gatherings/ evacuation centers from hotspot districts presenting in labour or likely to deliver (by induction of labour or elective caesarean section) in next 5 days should be tested even if asymptomatic.

**ANTENATAL CARE DURING COVID**

• Women should be advised to attend routine antenatal care, tailored to minimum, at the discretion of the maternal care provider at 12, 18-22 and 30-32 weeks of gestation, unless they meet current self-isolation criteria.
• Referral to antenatal ultrasound services for foetal growth surveillance is recommended after 14 days following the resolution of acute illness.
• As per recent Government of Karnataka guidelines, COVID-19 positive pregnant women who is stable, can be kept in home isolation until 4 weeks before the estimated date of delivery. (If the home isolation criteria is met as per GoK).
• Imminent Preterm delivery: Antenatal steroid should be administered to mothers with threatened preterm labour (gestational age 24-34 weeks)

**INTRAPARTUM CARE**

• Availability of separate labour room and OT for pregnant COVID-19 positive patient in labour with negative pressure system, neonatal resuscitation corner located at 2 metres away from the delivery table.
• Labour to be managed as per standard obstetric practise.
• When caesarean birth or other operative procedure is advised, it should be done after wearing PPE with minimal staff.
• **Current guidelines by the Government of India do not recommend use of Hydroxychloroquine, Chloroquine or antiviral drugs in pregnant women.**
**POSTNATAL CARE**

- Women and their healthy babies, who do not otherwise require maternal critical care or neonatal care, should be kept together in the immediate postpartum period.
- A separate isolation room should be available for the infant while they remain a person under investigation (PUI).
- If colocation (sometimes referred to as “rooming in”) of the new-born with his/her ill mother in the same hospital room occurs in accordance with the mother’s wishes or is unavoidable due to facility limitations, Consider using engineering controls like physical barriers (e.g., a curtain between the mother and new-born) and keeping the new-born ≥6 feet away from the ill mother.

**BREASTFEEDING**

*Exclusively breastfeed for first 6 months. Initiate breastfeeding within 1 hour of birth.*

During temporary separation, mothers who intend to breastfeed should be encouraged to express their breast milk to establish and maintain milk supply.

- If possible, a dedicated breast pump should be provided. Standard precautions should be followed.
- This expressed breast milk should be fed to the new-born by a healthy caregiver. (<60 years of age)
- A mother who has confirmed COVID-19 or is a Person under Investigation (PUI) should put on a facemask and practice hand hygiene before each feeding or other close contact with her new-born.
- KMC should be promoted, following precautions

**RESUSCITATION & COVID**

- If possible, resuscitation of neonate should be done in a separate adjacent room earmarked for this purpose. If not feasible, the resuscitation warmer should be physically separated from the mother’s delivery area by a distance of at least 2 meters.
• Minimum number of personnel should attend and wear a full set of PPE including N95 mask.
• Mother should perform hand hygiene and wear triple layer mask.
• Delayed cord clamping and skin-to-skin contact can be practiced.
• Neonatal resuscitation should follow standard guidelines.
• Endotracheal administration of medications should be avoided.
• Indications for intubation shall not change because of maternal COVID-19 status.

**ISOLATION NICU**

• An isolation NICU should be created, which should be as well equipped

**Criteria of admission to Isolation NICU / Isolation beds:**

The isolation NICU is meant for the following babies:

• Unstable neonates of COVID-19 positive / suspect mothers from the Labor room
• Unstable COVID-19 positive babies
• Ensure that at least 1-meter distance separates the neonatal beds.

Ensure adequate cross ventilation. There should be NO central air-conditioning.

• Medical and Nursing staff should be separate from the regular NICU staff.

**Personal Protective Equipment:**

• Staff caring for suspected and confirmed COVID 19, should follow strict precaution measures
• Follow the protocol of Donning and Doffing

**POSTNATAL WARD**

Postnatal ward health care workers should use Face mask, face shields or goggles and perform adequate hand hygiene before and after examining each baby.
**NEONATAL COVID-19**

**Confirmed COVID-19 infant:** A neonate born to the mother with a history of COVID-19 infection diagnosed within 14 days before delivery, up to 28 days after delivery, or if the neonate is directly exposed to close contacts with COVID-19 infection (including family members, caregivers, medical staff, and visitors)

**RECOMMENDED TESTING FOR SARS-CoV-2**

Babies born to mother with COVID-19 infection within 14 days before birth

H/o contact of baby with COVID-19 positive person (mother, family members, care givers, health care worker)

**Swab Collection:** Nasopharyngeal Swab is collected, and send for SARS-CoV-2 RNA RT-PCR.

If baby is stable: viral testing of the baby to be done within 24 hrs of birth if:
- If mother is positive
- Baby is symptomatic
- Baby exposed to COVID-19 positive person (caregiver/ family member)

If baby is sick: first test should be done within 24 hours of birth
- If first test is negative a repeat test should be done 5-14 days after birth/exposure.
- **However, the test should be done immediately** if new symptoms (RD, lethargy, seizures, apnea, refusal to feed, diarrhea appear)

**Serological testing – not recommended**

**SUPPORTIVE CARE**

- Incubators are preferred over Radiant warmer for temperature regulation
- Fluid and Electrolyte management as per guidelines
- Use of antibiotic as per unit protocol, when required
- Remember to investigate for Non-Covid pathogen also

**Monitoring:** For the neonates admitted to NICU the following need to be monitored- HR, RR, SpO2, temperature, BP monitoring, sugar monitoring and monitor for GI symptoms (feed tolerance, abdominal distension, vomiting)
**Respiratory support**

- Respiratory support for neonates with suspected or confirmed COVID-19 is guided by principles of lung protective strategy.
- The area chosen for respiratory support in neonates with respiratory distress must ideally be a negative pressure area.
- The neonates with respiratory distress must be supported with nasal (CPAP) & is preferred over HHFNC or nasal IMV as CPAP is less aerosol generating.
- If bag-mask ventilation is needed, providers should place a viral filter between the mask & the etCO2 device and oxygen source and wear full PPE.
- Intubation must be considered based on usual clinical indications and must be done by the most experienced health care provider.
- If available, an aerosol box to be used for intubation and inline suction device for suctioning.
- A bacterial/viral filter must be fitted in the expiratory limb before the exhalation valve (ventilator) or water chamber (bubble CPAP).
- Use disposable laryngoscope blades, if available. Suctioning of endotracheal tubes should be performed using in-line suctioning catheters.
- Video laryngoscopy should be performed (if available).

**SPECIFIC THERAPY**

- Specific anti-COVID-19 treatment like antivirals or chloroquine/hydroxychloroquine is not recommended in symptomatic newborns.
- Use of adjunctive therapy such as systemic corticosteroids, intravenous immunoglobulin and convalescent plasma is also not recommended in symptomatic newborns with suspected or confirmed COVID-19.
- Use of micronutrients such as Zinc, Vitamin A, C and D etc., having Immunomodulation effect can be considered.
- Only supportive care is needed, as per the problem identified.
DISCHARGE POLICY

The following policy is suggested:

- COVID-19 positive asymptomatic mother and COVID-19 positive well baby: discharge together for home isolation. It is not necessary to document a negative swab for the neonate.

- COVID-19 positive symptomatic mother with
  - COVID-19 positive or negative ‘well’ baby: discharge baby early (3-4 days) with competent care-taker. It is not necessary to document a negative swab for the neonate.
  - COVID-19 positive baby with symptoms: discharge after the baby is well. A repeat swab can be done between 10 -14 days if baby is still symptomatic.

**On Discharge:**

Counselling and communication regarding the disease process is an important aspect. The following instructions need to be communicated to the mother/ care taker:

- Baby should be brought back to hospital if there are any ‘red flag’ signs /symptoms. (refusal to feed, decreased urine output, breathing difficulties, jaundice, convulsion, lethargy or any symptom which the mother or care taker perceives as abnormal)

- Advice mother and baby home isolation in a separate room. The baby should be cared for by the mother, with advice to avoid handling of the baby by any elderly relative (>60 years) at home. If mother requires prolonged admission, and baby is well, it is advisable to discharge the baby with a competent care taker, with advice regarding feeding & neonatal care.

- Hand hygiene and its relevance should be taught to the care givers.

- Respiratory mask etiquette should be taught to the care givers.

- Encourage mothers to BREASTFEED only, educate mothers regarding breastfeeding ‘position’ and ‘attachment’.

- Feeding Advice: If breast milk substitutes are to be used when mother is still admitted in hospital, appropriate education regarding preparation, and administration is to be given to the caretaker. FEEDING BOTTLES and pacifiers should not be advised.
• Uninfected individuals > 60 years of age (eg: grandparents) & those with co-morbid conditions should not be assigned to provide care if possible.

**IMMUNIZATION POLICY**

**ALL NEONATES NEED TO BE IMMUNIZED AS PER NATIONAL GUIDELINES**

BCG, OPV zero dose and Hepatitis B should be given before discharge.

**FOLLOW UP POLICY**

• Once stable COVID-19 positive or negative babies are discharged, they should be followed at 2 weeks of age, or earlier, if the baby becomes sick.
• The follow up policy of the babies is similar to the follow up policy of the NICU graduates

**INFECTION PREVENTION AND CONTROL (IPC) FOR COVID-19**

**General Precautions**

• All health care personnel working can be done-in to hospital scrubs (if provisions are available)
• Limit your personal belonging inside NICU (like wallet, watches).
• Follow all the steps of hand hygiene.
• Use non-dominant hand for opening doors, switching on and off the fans, warmers, lights.
• Social distancing of minimum 1 meter should be maintained between the team members (doctors/nurses/support staff, mothers and patient attendants).
• Counselling area to be shifted to the main entrance of NICU or a suitable place where you can maintain social distance norms
• Restrict patient attendants’ entry inside the NICU.

**DISINFECTION PROTOCOL**

• Wear PPE before disinfecting. If equipment or surface is visibly soiled, first clean with soap & water.
• Floors, Chairs, Tables, Door handles, Telephone, Light switches, nursing station - Once every shift, 0.5 % sodium hypochlorite.
• Stethoscope, BP cuff, Thermometer, Injection tray - After every use, 70 % ethyl alcohol.
• Follow routine biomedical waste disposal handling, segregation, transport and final disposal guidelines as prescribed by the guidelines

**VISITORS POLICY**

Visitor’s policy in COVID situation (in Non-COVID newborn care areas)

Mother with suspected or confirmed COVID 19 should not be allowed to neonatal care area.

COVID-19 mother may be allowed to visit her neonate admitted in NICU if she fulfills all of these:

• Resolution of fever without the use of antipyretics for at least 72 hours AND
• Improvement (but not full resolution) in respiratory symptoms AND
• Negative results of a molecular assay for detection of SARS-CoV-2 in case of severe disease
• For neonates roomed in with mother having suspected or confirmed COVID 19, allow one healthy attendant to assist her in baby care activities after training in respiratory and hand hygiene maintenance

If the mother is sick and cannot visit the baby due to her co-morbidities:

• Unstable baby - Show the baby once daily and explain the prognosis and restrict the frequency of visits by patient attendants. Use digital technology like video calls for showing the baby multiple times.
• Stable baby fit to be taken care by the attenders - Allow single designated attendant who is symptom free (fever, cough, cold) (aged<60 years)
• The mother/Visitor should wear mask (cloth/ surgical mask) throughout their stay in the NICU
• The visitor should be asked to frequently sanitize their hand using alcohol-based hand sanitizer after touching the surfaces in the NICU
• Once neonate is stable, explain to the parents and shift the baby to postnatal ward in order to restrict the entry of visitors.
Use video-counselling facilities to limit the visitors. All visitors should be screened using a checklist for ILI.

**ETHICAL PRINCIPLES FOR OPTIMUM CARE DURING THE COVID-19 PANDEMIC**

- Ethics are central to the clinical care of COVID-19 patients in the same way that ethics pertains to all patients.
- Clinical care involves using clinical expertise to do what is best for patients within a relationship of care. This section provides a brief introduction to some of the ethical considerations that are important to remember in the context of COVID-19.

**REPORTING OF DEATH DURING COVID-19**

- We recommend the use of emergency ICD codes as outlined in the International guidance for certification and coding of COVID-19 as cause of death. As there are six types of coronaviruses, we recommended not to use “coronavirus” in place of COVID-19.

**DISPOSAL OF COVID-19 SUSPECTED OR CONFIRMED DEAD BODIES**

- Health worker attending to the dead body should use PPE.
- All tubes, drains and catheters on the dead body should be removed.
- Any puncture holes or wounds (resulting from removal of catheter, drains, tubes, or otherwise) should be disinfected with 1% hypochlorite and dressed with impermeable material.
- Apply caution while handling sharps such as IV catheters and other sharp devices. They should be disposed into a sharps container.
- Place the dead body in leak-proof plastic body bag. The exterior of the body bag can be decontaminated with 1% hypochlorite. The body bag can be wrapped with a mortuary sheet or sheet provided by the family members.
- If the family of the patient wishes to view the body at the time of removal from the isolation room or area, they may be allowed to do so, with the application of Standard Precautions.
• All medical waste must be handled and disposed of in accordance with Bio-medical waste management rules.
• The health staff who handled the body will remove personal protective equipment and will perform hand hygiene.
• All surfaces of the isolation area (floors, bed, railings, side tables, IV stand, etc.) should be wiped with 1% Sodium Hypochlorite solution; allow a contact time of 30 minutes, and then allowed to air dry.

TELEMEDICINE DURING COVID-19
• Telemedicine, which is also used synonymously with ‘remote medical care’ refers to providing clinical health care through electronic communication technologies, rather than through in-person meeting between a patient and a doctor.

MENTAL HEALTH SUPPORT FOR PATIENTS & PROFESSIONALS
SIMPLE AND PRACTICAL INTERVENTIONAL STRATEGIES
• Accept their emotional stress non-judgmentally and ensure confidentiality.
• Create an environment of acceptance and taking positive action - encourage them to ventilate their feelings and ask for help as necessary.
• Learn to break bad news and handle grief reaction.
• Help sort out problems by effective communication with significant others.
• Give simple reliable information from neutral sources such as WHO, ICMR, Indian Academy of Pediatrics and reputed journals.
• Check for overestimating the problem and avoid negative contagion - reduce the infodemic through rumours and fake news - social media distancing.
• Maintain a routine of daily activities (adequate sleep, healthy eating, exercise, meditation, yoga, time for hobbies) and regular social contacts.
• Physical activity is an accessible measure to blunt the mental health crisis currently being experienced by pregnant and postpartum women.
• Ensure adequate family time for interactions, discussions and to prepare for life style changes as normalcy will be redefined.
• Never hesitate to ask them to get in touch with mental health professionals, especially if they have suicidal ideation, worsening of symptoms in spite of adequate intervention and when they are aggressive, sleepless, experience severe health anxiety or indulge in self injurious behavior.

**COVID-19 VACCINES AND DRUGS**

<table>
<thead>
<tr>
<th>COVID-19 VACCINES AND DRUGS</th>
<th>PRECLINICAL</th>
<th>PHASE I</th>
<th>PHASE II</th>
<th>PHASE III</th>
<th>APPROVAL</th>
</tr>
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<td>23</td>
<td>13</td>
<td>2</td>
<td>0</td>
<td></td>
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<tr>
<td>Vaccines not yet in human trials</td>
<td>Vaccines testing safety and dosage</td>
<td>Vaccines in expanded safety trials</td>
<td>Vaccines in large-scale efficacy tests</td>
<td>Vaccine approved for limited use</td>
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1. INTRODUCTION

1.1 Virology and Epidemiology

Coronaviruses are important human and animal pathogens. At the end of 2019, a novel coronavirus was identified as the cause of a cluster of pneumonia cases in Wuhan, a city in the Hubei Province of China. It rapidly spread, resulting in an epidemic throughout China, followed by an increasing number of cases in other countries throughout the world. In February 2020, the World Health Organization designated the disease COVID-19, which stands for coronavirus disease 2019. Full-genome sequencing and phylogenetic analysis indicated that the coronavirus that causes COVID-19 is a beta coronavirus in the same subgenus as the severe acute respiratory syndrome (SARS) virus (as well as several bat coronaviruses), but in a different clade. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus that causes coronavirus disease 2019 (COVID-19). Recently, researchers have shown that a variation in the viral genome of COVID-19 improved its ability to infect human cells and helped it become the dominant strain circulating around the world. The variant, named 'D614G', makes a small but effective change in the 'spike' glycoprotein that protrudes from the surface of the virus, which it uses to enter and infect human cells.

Globally, more than 15 million confirmed cases of COVID-19 have been reported. Since the first reports of cases from Wuhan, a city in the Hubei Province of China, at the end of 2019, cases have been reported in all continents, except for Antarctica. As of July 22nd 2020, over 12 lakh cases have been reported in India, with over 29,000 deaths.

Different modes of transmission of coronavirus include contact, droplet, airborne, fomite, fecal-oral, blood borne, mother to child and animal to human transmission. Direct person-to-person transmission is the primary means of transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It is thought to occur through close-range contact, mainly via respiratory droplets; virus released in the respiratory secretions when a person with infection coughs, sneezes, or talks can infect
another person if it makes direct contact with the mucous membranes; infection can also occur if a person touches an infected surface and then touches his or her eyes, nose, or mouth. The larger droplets fall on to the ground within 1-2 metres and typically do not travel more than six feet (about two meters). This is why there is so much emphasis on maintaining distance so that these droplets can be prevented from directly transmitting from one person to another. But there are also smaller droplets that are less than 5 microns in size, they are called aerosols and since they are small in size, they can stay a bit longer in the air as they take a little longer to settle on the ground. These droplets can be moved around by gusts of winds, etc. Therefore, these particles could be inhaled by other people who are in the vicinity. This form of transmission of COVID-19 can be called as airborne transmission. Recent studies have emphasized that COVID-19 has a great risk for airborne spread and need to revise guidelines.

Transmission of SARS-CoV-2 from asymptomatic individuals (or individuals within the incubation period) has also been well documented.

The incubation period varies from 2-14 days with a median of 5 days. The average number of people infected by one infected individual is between 2-3.

The clinical symptoms are variable ranging from an asymptomatic state to acute respiratory distress syndrome and multi-organ dysfunction.

1. ‘Flu-like’ with no fever – Headache, loss of smell, muscle pains, cough, sore throat, chest pain, no fever
2. ‘Flu-like’ with fever – Headache, loss of smell, cough, sore throat, hoarseness, fever, loss of appetite
3. Gastrointestinal – Headache, loss of smell, loss of appetite, diarrhoea, sore throat, chest pain, no cough
4. Severe level one, fatigue – Headache, loss of smell, cough, fever, hoarseness, chest pain, fatigue

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5. Severe level two, confusion – Headache, loss of smell, loss of appetite, cough, fever, hoarseness, sore throat, chest pain, fatigue, confusion, muscle pain

6. Severe level three, abdominal and respiratory – Headache, loss of smell, loss of appetite, cough, fever, hoarseness, sore throat, chest pain, fatigue, confusion, muscle pain, shortness of breath, diarrhoea, abdominal pain

Current evidence suggests that 80-85% of cases are mild, 10-15% are severe with lower respiratory tract involvement and 5% are critical needing ICU care. The fatality rate is reportedly between 2-3% but can vary from 0.5-10% depending on the number tested, the percentage of elderly people in the population, and availability of critical care support in the hospitals.
Extra pulmonary manifestations of COVID-19: The pulmonary manifestation of COVID-19 caused by infection with SARS-CoV-2, including pneumonia and ARDS are well recognized. In addition, COVID-19 is associated with deleterious effects on many organ systems. Common extra pulmonary manifestations of COVID-19 are summarized here. Image courtesy: Extrapulmonary manifestations of COVID-19 https://doi.org/10.1038/s41591-020-0968-3
Pathophysiology of COVID-19. SARS-CoV-2 enters host cells through interaction of its spike protein with the entry receptor ACE2 in the presence of TMPRSS2 (far left). Proposed mechanisms for COVID-19 caused by infection with SARS-CoV-2 include (1) direct virus-mediated cell damage; (2) dysregulation of the RAAS as a consequence of downregulation of ACE2 related to viral entry, which leads to decreased cleavage of angiotensin I and angiotensin II; (3) endothelial cell damage and thromboinflammation; and (4) dysregulation of the immune response and hyperinflammation caused by inhibition of interferon signaling by the virus, T cell lymphodepletion, and the production of proinflammatory cytokines, particularly IL-6 and TNFα. Image courtesy: Extrapulmonary manifestations of COVID-19 https://doi.org/10.1038/s41591-020-0968-3
A schematic showing possible factors resulting in low incidence and less severity of coronavirus disease (COVID-19) in pediatric age group. Children in generally have healthier lungs and are less exposed to smoke and pollution. The maturity, binding ability and function of Angiotensin converting enzyme (ACE2) receptors required by severe acute respiratory syndrome–coronavirus-2 (SARS-CoV-2) to enter the cells, is lower in children resulting in minimal lung injury. More extensive exposure to other viruses may provide cross immunity to SARS-CoV2. A cytokine storm or systemic inflammatory response syndrome that results in inflammation and fluid build-up leading to respiratory distress is not well developed in children. More efficient T-cells response in children may be another reason for superior outcomes. SARS-CoV-2 proteins appear to attack β hemoglobin chains and “capture” porphyrins inactivating gas exchange capabilities of hemoglobin (Hb) and interfering with heme anabolic cycle. Young infants, with fetal Hb (α2γ2) without β chains, may potentially be less susceptible to SARS-CoV-2 mediated effects on Hb. Image courtesy: Satyan Lakshminrusimha.
1.2 Effect of COVID-19 on pregnancy

Physiological immune system changes in the pregnancy does not render them more susceptible to severe infections, compared to normal population. Most pregnant women will experience only mild or moderate symptoms. Cough, fever, running nose, shortness of breath, headache, anosmia and loss of taste, gastrointestinal symptoms are other relevant symptoms. Most patients are asymptomatic even in the third trimester. More severe symptoms which suggest pneumonia and marked hypoxia are widely described with COVID-19 in older people, the immunosuppressed and those with chronic conditions such as diabetes, cancer or chronic lung disease.

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

Risk Factors-

Risk factors that appear to be associated with hospital admission with COVID-19 illness include:
1. Black, Asian or minority ethnicity (BAME) - increased incidence of these patients indicates, that this association may be related to socioeconomic or genetic factors, or differences in response to infection; however, further research is needed
2. Overweight or obesity- pregnant women with a BMI ≥25 kg/m2 were more likely to be admitted to hospital with COVID-19
3. Pre-existing comorbidity - comorbidities such as diabetes was associated with pregnant women being admitted to hospital with COVID-19.
4. Maternal age >35 years
5. Vitamin D deficiency- Recently, vitamin D supplementation has been suggested to be beneficial in reducing the risk of respiratory tract infections, although data are limited

The virus spreads mainly from person-to-person contact. Pregnant women can take the same steps as other people to protect themselves, including

- washing hands often with soap and water for at least 20 seconds
- cleaning hands with a hand sanitizer that contains at least 70% alcohol if you can’t wash them (rub until your hands feel dry)
- avoiding touching your eyes, nose, and mouth
- staying home as much as possible
- staying at least 6 feet away from other people if you need to go out
- avoiding people who are sick

1.3 Transmission

1.4 Effect on Foetus and Neonate

Currently, there is no data suggesting an increased risk of miscarriage in relation to COVID-19. Recent studies indicate very less neonatal infection within 48 hrs of delivery in COVID positive mothers.
2. GENERAL GUIDELINES FOR OBSTETRIC HEALTH CARE PROVIDER

Reception and Delivery area precautions:

- All pregnant women who get admitted, should be considered as ‘suspect COVID-19’ patients, and should have a separate triage area, separate labour ward & OT preferably with a negative pressure system to limit the spread of infection and patient should wear a triple layer face mask for source containment.

- All OBG-Gyn Healthcare professionals should be aware of the intensity of the situation of COVID-19 Pandemic & take adequate contact & droplet precautions and Preventive measures to reduce the spread of the disease and measures for personal protection from the disease.

- OBG-Gyn professionals should contact the local/ state health department for the Guidance on Screening and testing Pregnant women or PUI & follow the national protocol.

- It is the deemed responsibility of the Practitioners to duly notify the Department of Health and Family Welfare of the GOVT of Karnataka about Pregnant women/ PUI of suspected COVID 19 infection and the Testing should be conducted at Govt accredited Labs, and the report duly notified to them.

- A registry has to be maintained regarding all the confirmed COVID19 infection in pregnancy, including the maternal and neonatal outcomes in detail for future references

- All Outpatient Visits must be specifically addressed based on the severity of the situation, with the following:
  - Universal mask policy for clinicians, staff, patients, and visitors
  - Changing waiting room and clinic space to accommodate physical distancing
  - Hand hygiene stations for patients before entering the facility/ waiting room.
  - Preserving in-person visits for those patients requiring physical evaluation or interventions
  - Maximizing use of all telehealth modalities.

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- Prioritizing in-person visits for those with greatest medical need for in-person examination, followed by elective visits.
- Pre-appointment phone screening, symptom and temperature checks at the building entrance, and possible masking.
- Health care practitioners should promptly notify infection control personnel at their facility of the anticipated arrival of a pregnant patient who has confirmed COVID-19 or is a PUI so that infection control measures can be kept in place.
- Women should be met at the maternity unit entrance by staff wearing appropriate PPE and be provided with a surgical face mask. And ALL staff should wear Personal Protective Equipment (PPE) precautions as per national guidance.
- Intrapartum services should be provided in a way that is safe, with reference to minimum staffing requirements and the ability to provide emergency obstetric, anaesthetic and neonatal care where indicated.
- Separate delivery room and operation theatres are required for management of suspect or confirmed COVID-19 mothers. No unnecessary items like chairs, books, files, etc. should be kept in the rooms.

**Do’s and Don’ts for Obstetric care providers in COVID-19 Pandemic**
- If a woman meets 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.
- Do not delay obstetric management in order to test for COVID-19.
- Elective procedures like induction of labour for indications that are not strictly necessary, routine growth scans not for a strict guidance-based indication and routine investigations should be reduced to minimum at discretion of care provider.
- If ultrasound equipment is used, it should be decontaminated after use.
- Healthcare professional working in any childbirth or neonatal area should report to their supervisor if they have respiratory or other symptoms suggestive of COVID-19.
• Healthcare professional directly involved in the care of patients with suspect/confirmed COVID-19 infection may consider taking hydroxychloroquine (HCQ) prophylaxis as advised by Government of India, on medical prescription.

3. SPECIFIC OBSTETRIC MANAGEMENT CONSIDERATION

3.1 Medical History
For all pregnant women obtain the following information:

- A detailed travel history
- History of exposure to people with symptoms of COVID-19
- Symptoms of COVID-19
- Coming from hotspot area
- Immunocompromised conditions

3.2 Information to be shared with pregnant women

- 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; you should contact your maternity care team immediately.

- There may be a need to reduce the number of antenatal visits you have. However, do not reduce your number of visits without agreeing first with your maternity team.

- Maternity care services and other speciality services would be available at a dedicated COVID health centres (DCHC) and dedicated COVID hospitals (DCH)

<table>
<thead>
<tr>
<th>Precautions a pregnant women should take:</th>
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<tbody>
<tr>
<td>![Icon] Wash your hands frequently</td>
</tr>
<tr>
<td>![Icon] Keep space between yourself and others</td>
</tr>
<tr>
<td>![Icon] Avoid touching your eyes, nose and mouth</td>
</tr>
<tr>
<td>![Icon] Cough or sneeze into your bent elbow or a tissue</td>
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3.3 Which pregnant women need testing for COVID-19?

- All symptomatic individuals with history of travel in last 14 days
- All symptomatic contacts of laboratory-confirmed cases
- All symptomatic health care workers with ILI
- All patients with Severe Acute Respiratory Illness (fever and cough and/or shortness of breath)
- Asymptomatic direct and high-risk contacts of a confirmed case should be tested once between day 5 and day 14 of coming in his/her contact in hotspots/ cluster (as per MoHFW) and in large migration gatherings/ evacuation centers.
- Direct and high risk contact is defined as those living in the same household, traveling together by any conveyance, working together in proximity (same room) or healthcare workers providing direct care.
- **Recently, ICMR has announced an additional criterion for pregnant women:** pregnant women residing in clusters/ containment area or large migration gatherings/ evacuation centers from hotspot districts presenting in labour or likely to deliver (by induction of labour or elective caesarean section) in next 5 days should be tested even if asymptomatic.
3.4 Antenatal care

**General measures to minimize exposure of patients and health care providers**
- Consider decreasing number of antenatal clinic visits for low-risk pregnancies (see suggestion below)
- Request patients to arrive without partner/companion

**Screen for symptoms/exposure over the phone (prior to arrival to clinic)**

- Negative OR not feasible
- Screen positive or known COVID positive

**Proceed with visit as scheduled**

**Screen at hospital Entrance/unit**

- Negative
  - **Routine precautions**
    - Hand hygiene
    - Keep 2m distance

- Positive
  - Identify patient as screen positive
    - Prioritize these patients to minimize their stay in the waiting area
    - Patient to wear mask, Hand hygiene
    - Team to use PPE
    - Assess severity of symptoms, comorbidities and other risk factors
    - Consider testing for COVID-19 if meets criteria

**Routine antenatal care**
- as discussed below

**Is visit necessary for maternal/fetal reason?**

- Yes
  - Advise on precautions (mask, hand hygiene)
    - Notify team to use PPE

- No
  - Defer visit by at least 14 days
  - Advise patient to monitor symptoms, and indications to present to Emergency Room

**Mild**
- Advise patient to monitor symptoms, and indications to present to Emergency Room

**Moderate/ severe symptoms or risk factors**
- Refer to triage for detailed assessment
  - Notify team in triage

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
Algorithm for isolation of suspect/confirmed cases of COVID-19

Suspect cases directly reporting to COVID dedicated facility

Screening at Fever Clinics

Suspect COVID-19 Case

Mild and very mild (Fever/ URTI)

Admit to “Suspect case” section of COVID CARE CENTER (hotels/lodges/hostels/ stadiums)

Test all for COVID-19

Negative

Discharge & symptomatic management

Positive

Shift to “Confirmed case” section of COVID CARE CENTRE
Monitor health twice daily
Shift to DCHC or CDH if necessary

Moderate (Pneumonia with no signs of severe disease) (RR 15 to 30/minute, SpO2 90%-94%)

Admit to “Suspect case” section of DEDICATED COVID HEALTH CENTRE

Test all for COVID-19

Negative

Shift to non-COVID hospital/block and manage according to clinical assessment.
Monitor health twice daily
Shift to DCHC or CDH if necessary

Positive

Manage according to clinical assessment.
Observing all infection prevention and control practices.
Shift to non-COVID hospital/block when patient becomes stable

Severe (Respiratory rate ≥30/minute SpO2 < 90% in room air)

Admit to DEDICATED COVID HOSPITAL with ICU facility

Test all for COVID-19

Negative

Patient to remain in COVID-19 ICU

Positive

Manage according to clinical assessment
Discharge as per clinical assessment

Courtesy: FOGSI article on Pregnancy with COVID-19 infection Version2 (28th April 2020)
### Suggested modified antenatal care schedule for low-risk pregnancies
(to decrease exposure, decrease workload in case of understaffing of medical teams)

<table>
<thead>
<tr>
<th>Severity</th>
<th>Symptoms &amp; signs</th>
<th>Risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>• Asymptomatic</td>
<td>No comorbidities or obstetrical concerns</td>
</tr>
<tr>
<td></td>
<td>• Mild fever, mild cough, running nose</td>
<td>• Good compliance and easy access to care</td>
</tr>
<tr>
<td>Moderate</td>
<td>High fever</td>
<td>Comorbidities — hypertension, diabetes, renal disease, cardiovascular disease, lung disease, HIV, immunosuppressive medications</td>
</tr>
<tr>
<td></td>
<td>• Mild dyspnea</td>
<td>• Obstetrical concerns — preeclampsia, fetal growth restriction, preterm labour</td>
</tr>
<tr>
<td></td>
<td>• Severe cough</td>
<td>• Social concerns — poor compliance, limited accessibility to care</td>
</tr>
<tr>
<td>Severe</td>
<td>Shortness of breath, dyspnea</td>
<td>Same as above</td>
</tr>
<tr>
<td></td>
<td>• Hypotensive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cough &gt;1 teaspoon of blood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Suspected superimposed bacterial infection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• System failure – renal, liver</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dehydration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Confusion, decreased responsiveness</td>
<td></td>
</tr>
</tbody>
</table>

- Women should be advised to attend routine antenatal care, tailored to minimum, at the discretion of the maternal care provider at 12, 18-22 and 30-32 weeks of gestation, unless they meet current self-isolation criteria.
- Foetal Kick count to be maintained.
- For women who are self-quarantined because someone in their household has possible symptoms of COVID-19, appointments should be deferred for 14 days.
- Any woman who has a routine appointment delayed for more than 3 weeks should be contacted.
- Women should continue to be encouraged to take folic acid and vitamin D supplements as per standard recommendations, along with Zinc and Vitamin C supplementation.
- Even if a woman has previously tested negative for COVID-19, if she presents with symptoms again, COVID-19 should be suspected.
• Referral to antenatal ultrasound services for foetal growth surveillance is recommended after 14 days following the resolution of acute illness.

• Clinicians should be aware of the increased risk of domestic abuse in pregnancy, which has escalated during this pandemic. Women should be encouraged to share any concerns at every opportunity and provided with advice on how to access support if required.

• As per recent Government of Karnataka guidelines, COVID-19 positive pregnant women who is stable, can be kept in home isolation until 4 weeks before the estimated date of delivery. (If the home isolation criteria is met as per GoK).

• Imminent Preterm delivery: Antenatal steroid should be administered to mothers with threatened preterm labour (gestational age 24-34 weeks)

**Routine Antenatal Care during the pandemic**

**Antenatal Care Visits**

• Following the principles of social distancing, it is advisable to minimize the number of visits that a pregnant woman needs to leave her house. There is a minimum level of antenatal care and investigations which are necessary.

• For the low risk, asymptomatic and uninfected woman, at present, the recommended strategy for antenatal care is to conduct antenatal care visits by phone or video call supplemented with home blood pressure monitoring.

• Some visits may be deferred. Questions, counselling and minor ailments can be addressed remotely.

• An ultrasound is advised at 12-13 weeks and at 18-22 weeks as outlined below. Pregnancy visits can be timed with these sonographies. The next visit can be at about 30 to 32 weeks. Vaccinations and antenatal profile (blood and other investigations) can be planned during these visits. Growth scans in the last trimester are advised or performed only if indicated.
Women are advised to note fetal movements every day. For women who have high risk factors, the guidance of the HCP (Health Care Provider) is needed.

**Obstetric ultrasound during the pandemic**

- Ultrasound represents an important part of antenatal care in modern obstetric practice. Though most of the times it is a non-invasive procedure, ultrasound represents a high risk situation for coronavirus transmission. The virus can survive on inanimate surfaces such as an ultrasound machine for 48 to 96 hours and these surfaces are touched repeatedly by the operator.
- During invasive procedures (amniocentesis or fetal reductions), there is a potential for exposure to body fluids. There is physical proximity of less than a meter and examination time may be prolonged especially for detailed anatomy scans. Ultrasound rooms are typically small, poorly ventilated.
- Appointments should be scheduled to avoid waiting time and exposure. The woman should be screened as for a clinical visit. If there is a suspicion, the examination should be deferred. If the visit cannot be deferred, it should be scheduled at the end of the list so that thorough terminal disinfection is possible. The ultrasound room should be cleaned regularly. There should be minimum number of fomites in the room. The furniture should be hard surfaced to facilitate cleaning. The patient bed can have disposable covers where possible.
- In case the woman is sick and hospitalized due to the COVID19 infection and requires an ultrasound, it may be desirable to perform it at the patient’s bedside rather than transporting the woman to the ultrasound room.
- Hand hygiene, respiratory hygiene and mask wear advice should be followed. The operator should wear non-sterile gloves while performing the examination.
- The following is a suggested schedule for obstetric ultrasound examination.
Routine ultrasound examination in pregnant women

<table>
<thead>
<tr>
<th>Scan</th>
<th>Asymptomatic</th>
<th>Clinical screening is suspicious for COVID-19 exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>11+0 to 13+6 weeks</td>
<td>Combined test</td>
<td>Reschedule combined test in 2 weeks within gestational age window (unless local protocols differ)</td>
</tr>
<tr>
<td>Also for dating</td>
<td>Offer serum / NIPT screening</td>
<td>Offer NIPT/ serum screening If possible &amp; available and detailed scan in 3-4 weeks after quarantine</td>
</tr>
<tr>
<td></td>
<td>If possible &amp; available</td>
<td></td>
</tr>
<tr>
<td>18+0 to 19+4 weeks</td>
<td>Anatomical scan</td>
<td>Reschedule after quarantine in 2-3 weeks</td>
</tr>
<tr>
<td>Fetal growth scan in</td>
<td>Do not perform unless clinically indicated</td>
<td>Do not perform unless clinically indicated</td>
</tr>
<tr>
<td>third trimester</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Modification of routine ultrasound examination in women with suspected/probable/confirmed COVID-19 infection

<table>
<thead>
<tr>
<th>Scan</th>
<th>Outpatient</th>
<th>Hospitalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>11+0 to 13+6 weeks</td>
<td>Reschedule combined test in 2 weeks if still within gestational age window</td>
<td>Offer NIPT screening If possible &amp; available Perform at bed side</td>
</tr>
<tr>
<td>Also for dating</td>
<td>(unless local protocols differ)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Offer NIPT/ serum screening and detailed scan 3-4 weeks following recovery</td>
<td>Perform at bedside</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18+0 to 19.4 weeks</td>
<td>Reschedule in 3-4 weeks following recovery</td>
<td></td>
</tr>
<tr>
<td>Fetal growth scan in</td>
<td>Reduce frequency with first scan 2-4 weeks after recovery</td>
<td></td>
</tr>
<tr>
<td>third trimester</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

An ultrasound 14 days after the infection can be considered for the pregnant woman who has recovered from infection for reassurance

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
4. MANAGEMENT OF COVID-19 IN PREGNANCY

Pregnant Women with SARS-CoV-2 exposure
History of travel within the last 14 days / Residing in clusters/containment areas
Close contact with a confirmed case of COVID-19
(<1 metre for >15 minutes, living together, direct contact with body fluids)

Clinical Examination + RT-PCR on deep nasopharyngeal and pharyngeal samples

Asymptomatic
NO Isolation Rooms

Symptomatic
Fever >38C AND respiratory symptoms

Monitoring at home
(Temp + respiratory symptoms)

Monitoring at Hospital
Isolated room prefer with negative pressure (IRNP)
Protective gear for visitors/ health personnel
Delivery and neonatal procedure on site

SARS CoV-2 NEGATIVE
Isolation at home for 14 days
If Delivery:
Breast feeding as per guidelines
Mother isolated from newborn until viral shedding clears

USG Fetal surveillance
Growth + Doppler / 2 weeks

Stop monitoring

SARS CoV-2 POSITIVE

SARS CoV-2 NEGATIVE
Isolation at home for 14 days

SARS CoV-2 POSITIVE
Hospitalisation at a tertiary centre
Maternal Surveillance
+ Temp, HR, BP, RR (3-4times/day)
Fetal +FHR (1 time a day)
Chest Imaging (HRCT or X-ray) if inevitable, with abdominal shield
+Fetal Maturation by steroid depending on maternal Status (24-34 weeks of gestation)
+ IV antibiotics treatment (depending local Protocol)

Clinical Self-monitoring
If Symptoms persist
RETEST (possible false negative)
4.2 **Intrapartum Care:**

- Availability of separate labour room and OT for pregnant COVID-19 positive patient in labour with negative pressure system, neonatal resuscitation corner located at 2 metres away from the delivery table.
- Labour to be managed as per standard obstetric practise.
- For women who have no symptoms of COVID-19 but test positive for SARS-CoV-2 on admission, continuous electronic fetal monitoring (CEFM) during labour using cardiotocography (CTG) is not recommended routinely, unless it would normally be required for another reason (e.g. previous caesarean birth).

**Women with symptomatic confirmed or suspected COVID-19 are recommended to labour and give birth in an obstetric unit.**

On admission, a full maternal and fetal assessment should be performed, including:

- Assessment of the severity of COVID-19 symptoms by the most senior available clinician.
- Maternal observations including temperature, respiratory rate and oxygen saturation.
- Confirmation of the onset of labour, as per standard care.
- CEFM using CTG.

---

**Protective Gear**

**Advanced PPE**

---

**INTENSIVE CARE UNIT ADMISSION**

(Quick SOFA Score)

More than 1 following Criteria:

- Systolic Blood Pressure <100mm Hg
- Respiratory rate >22
- Glasgow Conscious score <15

**Recommended** – Oxygen therapy, respiratory support for treatment of hypoxemic respiratory failure, fluid therapy, antibiotics & management of shock

**SEVERE FAILURE CRITERIA**

(Consider caesarean delivery)

- SEPTIC SHOCK
- ACUTE ORGAN FAILURE
- FETAL DISTRESS

---

**The mode of delivery in a pregnant woman with suspected or confirmed COVID-19 should be guided by her obstetric assessment and her physiological stability (cardiorespiratory status & oxygenation). COVID-19 itself is not an indication for induction of labor or caesarean section.**
• Standard hourly maternal observations and assessment should be performed (as per the recommendations in the NICE guideline on Intrapartum Care), with the addition of hourly oxygen saturation.
• Oxygen should be titrated to aim for saturation above 94%.
• Women with symptomatic confirmed or suspected COVID-19 should be offered CEFM during labour and vaginal birth.
• 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.
• Water births are not recommended due to the potential risk of disease transmission through faeces.
• On attendance at the maternity unit, all birth partners should also be asked whether they have had any symptoms suggestive of COVID-19 – e.g. fever, acute persistent cough, hoarseness, anosmia, nasal discharge/congestion, shortness of breath, sore throat, changes in or loss of sense of smell or taste, wheezing or sneezing, in the preceding 7 days.

As per ICMR
• Aim to keep oxygen saturation >94%, titrating oxygen therapy accordingly.
• There is currently no evidence to favour one mode of birth over another. Mode of birth should not be influenced by the presence of COVID-19, unless the woman’s respiratory condition demands urgent delivery.
• There is no evidence that epidural or spinal analgesia or anaesthesia is contraindicated in the presence of coronaviruses. Epidural analgesia should therefore be recommended in labour to women with suspected/confirmed COVID-19 to minimise the need for general anaesthesia if urgent delivery is needed.
• In case of deterioration in the woman’s symptoms, make an individual assessment regarding the risks and benefits of continuing the labour, versus emergency caesarean birth if this is likely to assist efforts to resuscitate the mother.
• When caesarean birth or other operative procedure is advised, it should be done after wearing PPE with minimal staff...

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.

**Anaesthesia and Advice regarding Personal Protective Equipment for Caesarean Birth**

Intubation for general anaesthesia (GA) is an aerosol-generating procedure (AGP). This significantly increases risk of transmission of coronavirus to the attending staff.
• Regional anaesthesia {spinal, epidural or combined spinal-epidural (CSE)} is not an AGP hence preferred over the GA.
• For a non-urgent caesarean birth where regional anaesthesia is planned, 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).
• If Planned for GA, the scrub team should enter the theatre, scrub and don full PPE, including an FFP3 mask, before the GA is commenced.
• The number of staff in the operating theatre should be kept to a minimum, and all must wear appropriate PPE.

**We recommend:**
• There should be a separate Delivery team And SNCU team.
• Delivery team should include an SR, a JR and a Nurse, who are well versed about the resuscitation and have to wear PPE with N95 mask.
• Neonatal Resuscitation as Per Standard Protocol
• All Procedures like Intubation, Suctioning, Cardio pulmonary resuscitation, PPV has to be minimised.

---

**Guidelines regarding delayed cord clamping, skin to skin contact following delivery and anaesthesia during delivery:**

<table>
<thead>
<tr>
<th></th>
<th>Delayed Cord Clamping</th>
<th>Skin to Skin Contact</th>
<th>Anaesthesia/Analgesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO</td>
<td>YES</td>
<td>For newborns without complications</td>
<td>Epidural analgesia</td>
</tr>
<tr>
<td>ACOG</td>
<td>NO</td>
<td>NO</td>
<td>Early epidural analgesia</td>
</tr>
<tr>
<td>RCOG</td>
<td>YES</td>
<td>For newborns without complications</td>
<td>Epidural analgesia</td>
</tr>
<tr>
<td>ICMR</td>
<td>YES</td>
<td>NO</td>
<td>Epidural analgesia</td>
</tr>
<tr>
<td>FIGO</td>
<td>NO</td>
<td>YES</td>
<td>Regional Anaesthesia</td>
</tr>
<tr>
<td>Cochrane</td>
<td>YES</td>
<td>YES</td>
<td>Epidural/Spinal Analgesia</td>
</tr>
<tr>
<td>IJPP</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
</tbody>
</table>

If Neonate is Stable, >35wks, >1.8 kg and mother is stable, Baby can be shifted to mother side with adequate warmth and hygiene

If Neonate is unstable, <35wks, <1.8 kg or mother is not stable, Baby has to be shifted to the SNCU in a level 3 corridor in a proper sanitised transport box. And the corridor has to be sanitised after transport of the baby.
Routine Intrapartum care
Limit visitors

Cesarean Delivery

C-section management
- Use operating room with negative pressure if possible
- Analgesia — as per routine care
- Extend PPE to cover aerosol in case of aerosol-producing procedure (e.g., intubation)

Intrapartum management:
- Limit visitors and staff caring for the patient
- Negative pressure isolation room
- Analgesia — as per routine care
- Close maternal monitoring — symptoms, vitals
- Continuous electronic fetal monitoring
- May require assisted second stage via instrumental if respiratory status limits pushing efforts
- Consider extending PPE for aerosol protection once maternal pushing begins.
- C-section should be performed for the standard indications

Identify patient as screen positive
- Patient to wear mask, hand hygiene
- Care team to use PPE
- Consider testing for COVID-19 if meets criteria
- Notify teams — OB, anesthesia, NICU, infection control
- C-section should be performed for the standard indications

Postpartum care

Continue contact precautions in isolated/private room, PPE by team
- Monitor maternal symptoms, vitals
- Limit visitors

Points to be discussed with family (ideally before delivery):
- Counselling about care of infant & feeding options (See separate algorithm on neonatal care)

Screen at hospital entrance / triage

Negative OR not feasible

Screen positive or known COVID positive

Cesarean Delivery

Vaginal Delivery

Routine Intrapartum care
Limit visitors

Routine postpartum and neonatal care, Limit visitors

COVID-19 results becomes available

Negative

Positive

Discussion above should be revisited

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
4.3 Management of Patients with COVID-19 Admitted to Critical Care:

Particular considerations for pregnant women are:

- Hourly observations, monitoring both the absolute values and the trends.
- Titrate oxygen to keep saturations >94%.
- Hourly respiratory rate looking for the rate and trends: Young fit women can compensate for deterioration in respiratory function and are able to maintain normal oxygen saturations before they suddenly decompensate.
- So, a rise in the respiratory rate, even if the saturations are normal, may indicate deterioration in respiratory function and should be managed by starting or increasing oxygen.
- Radiographic investigations like chest X-ray and CT of the chest, on emergency basis can be done using abdominal shielding, to protect the fetus. Otherwise, consider MRI.
- Consider additional investigations to rule out differential diagnoses, e.g. ECG, echocardiogram. Do not assume all pyrexia is due to COVID-19 and also 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.
- Pregnant women with confirmed COVID-19 should be managed with supportive care recommended for non-pregnant adults.
- **Current guidelines by the Government of India do not recommend use of Hydroxychloroquine, Chloroquine or antiviral drugs in pregnant women.**
4.4 Postnatal care:
It is unknown whether new-borns with COVID-19 are at increased risk for severe complications. Transmission after birth via contact with infectious respiratory secretions is a concern.

- Women and their healthy babies, who do not otherwise require maternal critical care or neonatal care, should be kept together in the immediate postpartum period.
- A risks and benefits discussion with neonatologists and families is recommended to individualize care in babies who may be more susceptible.
- A separate isolation room should be available for the infant while they remain a person under investigation (PUI).
- The decision to discontinue temporary separation of the mother from her baby should be made on a case-by-case basis in consultation with clinicians, infection prevention and control specialists by accounting disease severity, illness signs and symptoms, and results of laboratory
testing for virus that causes COVID-19, SARS-CoV-2 of mother and neonate.

- If colocation (sometimes referred to as “rooming in”) of the new-born with his/her ill mother in the same hospital room occurs in accordance with the mother’s wishes or is unavoidable due to facility limitations, -- Consider using engineering controls like physical barriers (e.g., a curtain between the mother and new-born) and keeping the new-born ≥6 feet away from the ill mother.

Breastfeeding

- Initiate breastfeeding within 1 hour of birth.
- Exclusively breastfeed for the first 6 months.
- During temporary separation, mothers who intend to breastfeed should be encouraged to express their breast milk to establish and maintain milk supply.
- If possible, a dedicated breast pump should be provided. Prior to expressing breast milk, mothers should practice hand hygiene. After each pumping session, all parts that come into contact with breast milk should be thoroughly washed and the entire pump should be appropriately disinfected as per the manufacturer’s instructions.
• This expressed breast milk should be fed to the new-born by a healthy caregiver.
• Since SARS-CoV-2 has been detected on plastic for up to 72 hours, staff receiving bottles of expressed milk from mothers with COVID-19 should wear gloves.
• After securing the cap, bottles should be wiped with viricidal wipes or diluted bleach solutions and placed on a clean surface to air dry.
• After drying, bottles may be placed in hospital refrigerators in individual patient bins.
• If a mother and new-born do room-in and the mother wishes to feed at the breast, she should put on a facemask and practice hand hygiene before each feeding.
• A mother who has confirmed COVID-19 or is a Person under Investigation (PUI) should put on a facemask and practice hand hygiene before each feeding or other close contact with her new-born. The facemask should remain in place during contact with the new-born.
• She is instructed on hand hygiene and use of facemask until afebrile for 72 hours without the use of anti-pyretics and more than 7 days have passed since symptoms began.
• Postnatal care for women and babies following admission with COVID-19.
• All households are advised to self-isolate at home for 14 days after birth of a baby to a woman with current COVID-19 so as to ensure a full period of isolation in case of incubation of the virus in the baby.
• Families should be provided with guidance about how to identify signs of illness in their newborn or worsening of the woman’s symptoms, and provided with appropriate contact details if they have concerns or questions about their baby’s well-being.
• Bathing is not recommended in view of risk of hypothermia and hospital acquired infections.
• Introduce age-appropriate, adequate, safe, and properly fed complementary foods starting from 6 months up to 2 years of age.
• Continue breastfeeding for up to 2 years of age or beyond.
• **Milk donation:** Based on the available data on other coronaviruses, it is likely that the process of **pasteurization can destroy SARS-CoV-2** if present in breastmilk. **However, the European, as well as the Human Milk Banking Association of North America, recommend that mothers with active COVID-19 infection should not donate milk.**

<table>
<thead>
<tr>
<th>Summary of recommendations when mother with COVID-19 is caring for infant Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother infant contact at birth</strong></td>
</tr>
<tr>
<td><strong>During early childhood</strong></td>
</tr>
<tr>
<td><strong>If feeding is interrupted</strong></td>
</tr>
<tr>
<td>Practices the mother should perform during all infant and childcare</td>
</tr>
<tr>
<td>Best practices for breast-feeding</td>
</tr>
</tbody>
</table>
Questions regarding transmission, clinical features, and optimal mode of respiratory support in neonates with suspected or confirmed COVID-19 infection. A balance between providing optimal respiratory care and minimizing exposure to healthcare workers is crucial. COVID-19, novel coronavirus disease 2019; LMA, laryngeal mask airway; NICU, neonatal intensive care unit; PPV, positive pressure ventilation. (Image courtesy: Satyan Lakshminrusimha).
5. DELIVERY ROOM MANAGEMENT

Pregnant women with Confirmed or Suspected COVID-19 Case review among care providers to decide on the site of delivery as per the existing site guidelines, preferably, dedicated OT or Labour

Ensure mother has performed hand hygiene and wears a triple layer mask before delivery

Neonatal team preparation before delivery (COVID-19 NRP guidelines):-
- Assemble the neonatal COVID team
- Inform COVID on-call consultant
- Must ensure resuscitation trolley at least 2 metres away from the delivery table
- Minimum number of personnel to attend delivery
  - For low risk deliveries – 1 person trained in resuscitation
  - For high risk deliveries – at least 2 trained persons (standby person may wait in the next room)
- The most experienced provider should perform intubation (using transparent intubation boxes) if needed, to limit aerosol generating procedure
- All must wear PPE
- Change of PPE kit: For units with a dedicated resuscitation team for all deliveries, each delivery warrants change into a fresh PPE kit with a fresh pair of double gloves. This is necessitated so that a delivered neonate does not come in contact with likely contaminated external surface of the PPE & gloves, due to a previous delivery. In case of shortage of PPE, sterile plastic gown can be worn on the PPE to avoid contamination of the PPE with blood or amniotic fluid. The plastic gown should be appropriately discarded after completion of initial resuscitation. A change of gloves SHOULD be done.

Resuscitation:-
- As per COVID-19 NRP guidelines
- Aware of aerosol generating medical procedures
- Delayed cord clamping (not earlier than 1 minute) and avoid skin to skin contact (some institutions do recommend this)
- Vitamin K injection should be given to all neonates

Transport of Neonate from place of delivery to destination:
- Transport box must be thoroughly decontaminated before transport
- Neonates must be transported in closed transport box only
- If Neonate is Stable, >35wks, >1.8 kg and mother is stable, Baby can be shifted to mother side with adequate warmth and hygiene
- If Neonate is unstable, <35wks or <1.8 kg Baby has to be shifted to the NICU, in a level 3 corridor in a proper sanitised transport box. And the corridor has to be sanitised after transport of the baby……
- Any relative accompanying the neonate must wear triple layer mask

Delivery team hands over baby to NICU team

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
Setting up of a birthing room for a patient with suspected or confirmed COVID-19 undergoing labour and delivery. A negative pressure room is preferred with limited number of providers in the room to limit exposure. Additional personnel may be outside the room and be available if extensive neonatal resuscitation is needed. COVID-19, novel coronavirus disease 2019; HCP, Healthcare provider.

Image Courtesy: Satyan Lakshminrusimha

Physical barrier or separation >2m from the mother is a must
Neonatal Resuscitation as per NRP guidelines

Incubator with hood elevated with heating source
Precautions for aerosol generation procedures: N95 mask with goggles/shield Double Gloves Gown

Skilled personnel (max 3 persons) to attend delivery

Resuscitation in the delivery room with precautions to minimize risk to the infant. Appropriate PPE and maintaining at least 6-feet or 2-m distance from the mother with a barrier (curtain) in between is important. Alternatively, infant may be resuscitated in a separate room.

NRP, Neonatal Resuscitation Program;
Image Courtesy: Satyan Lakshminrusimha
Algorithm for suspected or confirmed COVID-19 patient necessitating cesarean. COVID-19, novel coronavirus disease 2019; L&D, labor and delivery; NICU, neonatal intensive care unit; OB, obstetrician team; OR, operating room; PPE, personal protective equipment; RN, registered nurse. Colored box indicators: blue box, nursing; orange box, anesthesia; green box, OB; gray box, pediatrics. Note: This protocol and other guidance should be adapted to your specific situation. No guideline can encompass every clinical scenario. Use clinical judgment as needed.


Preoperative

Patient presents to front desk and screened; L&D staff notified (Charge RN)

RN1: prepares patient in a negative flow room

RN1 notifies L&D & NICU charge nurses, Obstetric, Anesthesia, and Postpartum teams

RN1 and OB team have phone consult

RN1 and Anesthesia have phone consult

RN1 and NICU team have phone consult

Designated Runner: will be available outside negative pressure room for labs.

Substerile Scrub Area

Scrubs tech: dons PPE, scrubs and assures instruments/equipment

Anesthesia dons PPE prior to entering OR

OB team dons PPE and scrub to enter OR

NICU team dons PPE to enter OR; assures OR room ready (w/isolote in hallway for transport)

Intraoperative

RN2: circulating OR nurse

RN3: Baby nurse

Anesthesia to perform assessment/consent

CASE with OB Team

Phase One Recovery in OR

Designated Runner: will be available outside OR for labs, etc.

RN3/scrub tech assists Anesthesia and RN2 doff gown and glove in OR

OB team exit OR

Neonate exits OR by placing in isolote outside OR door

RN3/scrub tech assists OB team and NICU team doff gown and glove in OR

RN3 will doff PPE in OR

Neonate to be transported to room/nursery/NICU as deemed necessary

Postoperative

RN1 dons PPE and receives patient from RN2 and Anesthesia

Specimen handling: Label and place in bag→wipe bag #1 with sani-wipe→hand-off to runner (with gloves and wipe)→wipe bag with new sani-wipe and place in bag#2

PPE in negative pressure room: gown, gloves, mask, face shield, cap. PPE in OR: N95 mask, gown, gloves, face shield, cap, shoe covers.
6. NEONATAL EMERGENCY TRANSPORT SYSTEM (NETS)

Management between the Departure – Contact between the Hub and the Spoke Centre

- For every newborn who fulfills the NETS criteria, a specific form for COVID-19 risk infection has to be filled by a parent.
- During the phone call, the health care provider, confirms the safest way to reach the delivery room or the neonatal ward at the referring hospital.
- When the transport is officially confirmed, the transport team gathers at the ambulance with the transport incubator and an emergency bag.
- A complete separation among the members of the transport team is maintained to define two operational areas: the space dedicated to the care of the neonate (medical procedure area) and the space dedicated to the ambulance driver (carrier area).

During the NETS

(a) Stabilization of the newborn:
- In case of a suspected or confirmed COVID-19 positive newborn, who needs invasive aerosol generating procedure, the physician and the nurse should wear PPE.
- Stabilization of the neonate is based on current NRP and NETS procedures.
- Restriction of the minimum number of healthcare providers in the room, ideally trained transport staff.
- Closed suctioning systems should be used.
- After the patient stabilization, all the equipment (i.e. masks, laryngoscope, self-inflating bag) should be put in a plastic envelope ready for use during the ambulance transfer.

(b) Management in ambulance:
- The patient must be positioned in a closed transport incubator, avoiding reopening the portholes, except in case of resuscitation procedures.
- The doctor and the nurse of the NETS have to wear the N95 respirators, gloves, goggles, and disposable gown.
- The number of healthcare providers in the cabin must be minimized (NETS doctor and nurse only), and family members are not allowed.
- The loading/unloading of the transport incubator is carried out by the staff of the ambulance with mask and gloves, while making sure the cabin is always kept closed.
**Destination of the Patient**
After unloading the transport incubator, the ambulance staff does not escort the NICU’s team to the newborn ward, but they wait in the ambulance. The destination of the patient is regulated by a Regional protocol on NETS.

**End of Nets**
- Once the patient has been delivered, the nurse is responsible for restoring the material in a new clean emergency bag.
- The cleaning of the transport incubator and the monitors and ventilator must be done with disinfectant wipes or paper cloth soaked in 70% ethyl alcohol, diluted 0.5% chlorine solution, or other approved disinfectant.
- All the equipment (i.e., masks, laryngoscope, self-inflating bag) should be disposed or sterilized according to standard procedure.
- All procedures must be performed wearing disposable surgical mask, gloves and gown.
- At the end of the mission, the local emergency medical service is responsible for the sanitization of the vehicle, according to current protocols.

Neonatal emergency transport organization during COVID-19 pandemic. Courtesy: https://doi.org/10.1038/s41390-020-0937-z
7. NEONATAL COVID-19

7.1 Definitions:
1) **Suspected COVID-19 mother** – Symptomatic with history of fever (≥100.4°F), cough, running nose, difficulty breathing or shortness of breath, gastrointestinal symptoms, chills, muscle pain, headache, sore throat, new loss of taste or smell with history of contact with a COVID positive person at home, workplace or as a caregiver

2) **Confirmed COVID-19 mother** - Mother with positive RT-PCR for COVID-19 irrespective of clinical signs and symptoms

3) **Suspected COVID-19 infant** - Newborn born to a symptomatic mother as defined above

4) **Confirmed COVID-19 infant** – A neonate born to the mother with a history of COVID-19 infection diagnosed within 14 days before delivery, up to 28 days after delivery, or if the neonate is directly exposed to close contacts with COVID-19 infection (including family members, caregivers, medical staff, and visitors)

5) **Persons under investigation (PUI)** - Neonates born to pregnant women with confirmed COVID-19 or with test pending at the time of delivery should be considered as PUIs.

7.2 Clinical and laboratory features of all neonates who tested positive for COVID-19, reported so far in the literature:

<table>
<thead>
<tr>
<th>Clinical characteristics</th>
<th>Laboratory characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic</td>
<td>Lymphopenia</td>
</tr>
<tr>
<td>Respiratory distress - mild to moderate</td>
<td>Leukocytosis</td>
</tr>
<tr>
<td>Cough – sporadic</td>
<td>Thrombocytopenia</td>
</tr>
<tr>
<td>Mild fever</td>
<td>Elevated transaminases</td>
</tr>
<tr>
<td>Cyanosis (without respiratory distress)</td>
<td>Elevated cytokine levels (IL-6 and IL -10)</td>
</tr>
<tr>
<td>Feed intolerance</td>
<td>X-ray Chest – normal or bilateral infiltrates</td>
</tr>
<tr>
<td>Lethargy</td>
<td></td>
</tr>
</tbody>
</table>
7.3 Diagnosis:

Diagnosis of a newborn infant born to a suspected or COVID positive mother is imperative, but can be challenging at times as the sensitivity of the test depends on the timing and sample. RT-PCR testing of nose and throat swab for detection of SARS-CoV-2 nucleic acid has been recommended as the confirmatory test for COVID-19. Other alternative sample could be endotracheal aspirate.

**Testing guidelines**

Which neonates?

- Neonates born to mothers with COVID-19 infection within 14 days of delivery or up to 28 days after birth
- Symptomatic neonates who presented to emergency room, who was exposed to close contacts with COVID-19 infection (send throat swab for contacts also)
- Death of a symptomatic neonate in isolation NICU born to COVID-19 positive mother
- Brought dead neonate born to a suspected/confirmed COVID-19 mother
| When? | If **symptomatic**, specimens should be collected as soon as possible  
**If asymptomatic and roomed-in**, test only if and when mother’s test comes positive.  
If mother is COVID-19 positive and baby’s initial sample is negative, another sample should be repeated after 48 hours. |
|---|---|
| What sample? | **Not mechanically ventilated**  
2 swabs - Upper respiratory nasopharyngeal swab (NP) and throat swab. Both should be placed in the same tube.  
1 swab – If only one swab is available, the same can be used to sample first the throat and then the nasopharynx  
**Mechanically ventilated**  
Tracheal aspirate sample should be collected and tested as a lower respiratory tract specimen, in addition with a nasopharyngeal swab. |
| How to collect? | **Upper nasopharyngeal swab**  
- Use only synthetic fibre swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden shafts, as they may contain substances that inactivate some viruses and inhibit PCR testing.  
- Insert a swab into nostril parallel to the palate. Swab should reach depth equal to distance from nostrils to outer opening of the ear. Leave swab in place for several seconds to absorb secretions. Slowly remove swab while rotating it.  
- Place swabs immediately into sterile tubes containing 2-3 ml of viral transport media.  
**Oropharyngeal swab (e.g., throat swab):** Swab the posterior pharynx, avoiding the tongue.  
**Nasopharyngeal wash/aspirate or nasal aspirate**  
Collect 2-3 mL into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container.  
Other samples: Currently not advised; stool, urine and blood specimens, since the isolation is less reliable than from respiratory specimens. Do not take these specimens for testing (based on current advisory recommendations) |
| What PPE is needed for sample collection? | Clinicians should wear appropriate personal protective equipment during sampling.  
Nasopharyngeal swab  
- Hand Hygiene  
Disposable single use glove  
- Disposable Plastic Apron  
- Surgical facemask |
<table>
<thead>
<tr>
<th>Eye Protection (surgical mask with integrated visor or full-face shield or visor or goggles / safety spectacles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For any sampling from lower respiratory tract in intubated neonates a full set of PPE is a MUST</td>
</tr>
<tr>
<td>- Hand Hygiene</td>
</tr>
<tr>
<td>- disposable single use glove</td>
</tr>
<tr>
<td>- Long sleeved disposable gown</td>
</tr>
<tr>
<td>- N95 mask or another respirator mask</td>
</tr>
<tr>
<td>- Eye Protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Labelling the sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label each specimen container with the patient’s name, hospital ID number, specimen type and the date the sample was collected. Handle the sample with precautions under biosafety level 3 (BSL-3) conditions until is rendered non-infectious by laboratory.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How to store?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samples should be collected in viral transport media procured from microbiology laboratory and transported immediately in icepacks. One can use disposable thermocol cartons or plastic bags with ice cubes for in-house transport. If sending to another laboratory, store specimens at 2-8°C for up to 72 hours after collection. Storage can be done in a refrigerator dedicated for this purpose. If a delay in testing or shipping is expected, store specimens at -70°C or below. This requires deep freezers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How to send?</th>
</tr>
</thead>
<tbody>
<tr>
<td>If transporting by shipping, the samples need to be packed as per instructions Guidance for sample Collection, Packaging and Transportation for Novel Coronavirus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Where to send?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorized laboratories (See MOHFW website for latest list)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What test?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Transcriptase PCR is a rapid test for detecting COVID-19</td>
</tr>
</tbody>
</table>
Algorithm for COVID-19 testing using rapid antigen point-of-care test according to ICMR guidelines

Rapid Antigen Test kit ▲

Available

Not available

Rapid Antigen Test done

Positive

Negative

Asymptomatic

Symptomatic

To be reported as
‘positive’
(RT-PCR test not required)

To be reported as
‘negative’
(RT-PCR test not required)

Collect fresh nasopharyngeal swab and throat swab in VTM° tube

Result urgently needed*

Result not Urgent

RT-PCR (Throat swab)
If positive, Cycle threshold (Ct) have to be compulsorily given in report according to new ICMR rules (14th July 2020)
Ct value is the number of cycles required to detect the viral antigen. Lower the value (more viral load) higher the risk

Ct values:
- Value between 17 to 24 – high viral load
- Value between 24 to 31 – moderate viral load
Above both have to be admitted in hospital immediately
- Value above 31 – low viral load -> can be treated under home quarantine under constant observation

TrueNAT or CBNAAT available
(Gene Xpert)
(Approx. cost 4500-5000/-)

TrueNAT or CBNAAT NOT available

Positive

Negative

To be reported as
‘Positive’

To be reported as
‘Negative’

*Death, Severe Acute Respiratory Illness (SARI), Healthcare worker (HCW) after high risk exposure
°Viral Transport Medium
CBNAAT – Cartridge Based Nucleic Acid Amplification Test

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
### Time Line of COVID-19 (lab wise)

<table>
<thead>
<tr>
<th>Day</th>
<th>Clinical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0</td>
<td>Infected</td>
</tr>
<tr>
<td>D1-6</td>
<td>Onset of Symptoms</td>
</tr>
<tr>
<td>D7</td>
<td>IgM positive (D7-D21)</td>
</tr>
<tr>
<td>D7-D21</td>
<td>SARS CoV2 RNA &amp; Antigens will be positive</td>
</tr>
<tr>
<td>D22-D25</td>
<td>IgM disappears</td>
</tr>
<tr>
<td>D22</td>
<td>SARS CoV2 RNA &amp; Antigens disappear</td>
</tr>
<tr>
<td>D5</td>
<td>Asymptomatic phase</td>
</tr>
<tr>
<td>D6-D7</td>
<td>WINDOW PERIOD (only PCR is positive in this phase)</td>
</tr>
<tr>
<td>D7-D14</td>
<td>Symptomatic (IgM &amp; PCR both positive)</td>
</tr>
<tr>
<td>D14-D21</td>
<td>DECLINE PHASE (still infective) (IgM &amp; PCR both positive)</td>
</tr>
<tr>
<td>D21-D28</td>
<td>CONVALESCENCE PHASE (PCR may be positive but not infective)</td>
</tr>
</tbody>
</table>

- No detection of the virus by PCR in nasopharyngeal swab at birth BUT presence of anti-SARS-CoV-2 IgM antibodies in umbilical cord blood or neonatal blood collected within first 12 hours of birth or placental tissue suggest a possibility of Congenital infection.
- Extensive studies are required to confirm the role of antibody testing to detect in-utero transmission of COVID-19 infection, as the present data is limited to comment its role.

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**Role of Antibody testing for the Detection of SARS-CoV-2 infection**

<table>
<thead>
<tr>
<th>PCR</th>
<th>IgM</th>
<th>IgG</th>
<th>Clinical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>-</td>
<td>-</td>
<td>Patient may be in the window period of infection</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>-</td>
<td>Patient may be in the early stage of infection</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Patient is in the active phase of infection</td>
</tr>
<tr>
<td>+</td>
<td>-</td>
<td>+</td>
<td>Patient may be in the late or recurrent stage of infection</td>
</tr>
<tr>
<td>-</td>
<td>+</td>
<td>-</td>
<td>Patient may be in the early stage of infection. PCR result may be false-negative</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>+</td>
<td>Patient may have had a past infection, and has recovered</td>
</tr>
<tr>
<td>-</td>
<td>+</td>
<td>+</td>
<td>Patient may be in the recovery stage of an infection, or the PCR result may be false-negative</td>
</tr>
</tbody>
</table>

*Disclaimer: this chart is for illustrative purposes only.*
Peripartum “vertical” transmission of SARS-CoV-2 infection: maternal COVID-19, timeline of infectivity, symptom duration and antibody titers with modes of transmission and neonatal status are shown. The inset graph shows the period of positive testing with nasopharyngeal RT-PCR for SARS-CoV-2 in the blue shaded area. The duration of symptoms is shown by the black bar on the horizontal axis. The titers of IgM (green line) and IgG (red line) in typical patients as described in Li et al.16 are shown. Potential methods of intrauterine, intrapartum and immediate postnatal transmission are depicted in the left panel. Neonatal testing status with nasopharyngeal RT-PCR and serology titers are shown in the pink box for intrauterine transmission, the orange box for intrapartum or immediate postnatal transmission, the yellow box for superficial contamination/transient viremia and the green box for no evidence of neonatal infection. COVID-19, novel coronavirus disease 2019; Ig, Immunoglobulin; RT-PCR, real-time polymerase chain reaction; SARS CoV-2, severe acute respiratory syndrome-coronavirus-2. Image Courtesy: Vertical Transmission of SARS-CoV-2: What is the Optimal Definition? https://doi.org/10.1055/s-0040-1712457.
7.4 Neonatal Examination

- Routine physical examination to be done at the time of admission, daily rounds, and discharge. Detailed examination on day 1 of life and at discharge.
- Proper hand hygiene, N95 face mask, and PPE to be used while examining the baby every time.
- Daily monitoring of vitals to be done every 6 hours with special attention to any development of new symptoms.
- Metabolic screening, hearing screening can be postponed till neonate is negative for COVID-19.
- If the neonate becomes COVID-19 positive, manage as per the confirmed COVID-19 neonate case guidelines.

7.5 List of Things Required in Isolation NICU

<table>
<thead>
<tr>
<th>Required Items</th>
<th>Required Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incubators (preferred)</td>
<td>Birth dose Immunization kit</td>
</tr>
<tr>
<td>Radiant Warmer with probe</td>
<td>Baby Diapers</td>
</tr>
<tr>
<td>O2 prongs</td>
<td>Thermometer</td>
</tr>
<tr>
<td>Ventilator with CPAP and consumables</td>
<td>Weighing scale, Measuring tape</td>
</tr>
<tr>
<td>Pulse Oximeter</td>
<td>Utensils, cups, paladai</td>
</tr>
<tr>
<td>Resuscitation kit with Bag, Mask, Intubation tray</td>
<td>Term and Preterm formula</td>
</tr>
<tr>
<td>ET tubes, Suction Cathether, NG tubes, syringes</td>
<td>Induction stove</td>
</tr>
<tr>
<td>Syringe pump</td>
<td>Filtered water</td>
</tr>
<tr>
<td>Phototherapy unit</td>
<td>Baby clothes and sheets</td>
</tr>
<tr>
<td>Essential drugs, Vit K</td>
<td>0.5% Sodium Hypochlorite, 70% ethyl alcohol, H2O2</td>
</tr>
</tbody>
</table>

7.6 Supportive care

- Incubators are preferred over Radiant warmer for temperature regulation
- Fluid and Electrolyte management as per guidelines
- Use of antibiotic as per unit protocol, when required
- Remember to investigate for Non-Covid pathogen also
7.7  **Respiratory support**

- Respiratory support for neonates with suspected or confirmed COVID-19 is guided by principles of lung protective strategy including use of non-invasive ventilation.
- Negative airborne isolation rooms are preferred for patients requiring aerosolization procedures.
- If not available, negative pressure can also be created by 2-4 exhaust fans, driving air outside rooms.
- Isolation rooms should have adequate ventilation
- There should be NO central air-conditioning.
- If room is air-conditioned, ensure 12 air changes per hour and filtering of exhaust air.
- Intubation should be used only for usual indications and to consider use of pre-medication for non-emergent intubation and should be performed by most experienced person.
- Neonates should be nursed preferably in prone position due to the following advantages:
  - Improves oxygenation
  - Improves respiratory mechanisms
  - Homogenizes the pleural pressure gradient
  - Increase lung volume and reduce the amount of atelectatic regions.
  - Facilitates the drainage of secretions
  - Reduce ventilator- associated lung injury

7.7.1  **Non-invasive respiratory support**

- CPAP is preferred over Humidified high flow nasal cannula or Nasal Intermittent Mandatory ventilation, as CPAP is less aerosol generating.
- A headbox with all closed ports except one for tubing of circuit can be used to cover the head of neonate receiving any form of non-invasive ventilation to prevent spread of aerosol.
- If non-invasive ventilation is generated by mechanical ventilators with high-efficiency particulate air (HEPA) filters, the risk of aerosolization is likely lower.
• A bacterial/viral filter must be fitted in expiratory limb before the exhalation valve (Ventilator) or water chamber (Bubble CPAP)

7.7.2 Invasive respiratory support

• Rapid sequence intubation is recommended for those in respiratory failure with COVID-19.

• If bag-mask ventilation is needed, providers should place a viral filter between the mask and the end tidal CO2 device and oxygen source and wear full PPE.

• If PPE is likely to inhibit the ability to visualize the vocal cords, video laryngoscopy should be performed (if available).

• Use disposable laryngoscope blades, if available.

• Suctioning of endotracheal tubes should be performed using in-line suctioning catheters.

• If a patient needs to be disconnected from the ventilator, the endotracheal tube should be clamped and the circuit disconnected with the heat moisture exchanger still attached to the patient.

• Conventional ventilators with dual limb circuits with expiratory HEPA filters connected to cuffed endotracheal tubes are nearly closed systems that significantly decrease the risk of aerosolization.

• The high-frequency oscillator ventilator (HFOV), without specialized experimental circuits, is not able to filter the exhaled air, making its use limited.
**Practical approach to neonates with suspected or confirmed COVID-19**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Details</th>
</tr>
</thead>
</table>
| **Bag and mask/ T-piece and** | **Delivery room and NICU; should continue to be used as recommended by the NRP, with all protective measures in place for suspected or confirmed cases.**  
**A small viral/bacterial filter should be placed in between the bag and the mask or in the expiratory limb (before the PEEP valve) of a self-inflating bag. Normally, the filter should be replaced every 8-12 hours.**  
**Note: when placed between the bag and mask, the filter adds significant dead space. For that reason, the smallest available filter should be used and prolonged ventilation using this apparatus should be avoided.**  
**Since no positive COVID-19 cases were detected in infants <1000g it may be reasonable to not use filters while applying bag and mask ventilation to these infants to avoid possible iatrogenic hypercapnia with subsequent intraventricular haemorrhage.**  
| **mask ventilation**          |                                                                                                                                                                                                         |
| **Suction (oropharyngeal area** | **Non-intubated infant: continuous suctioning reduces aerosol spread better than several episodes of intermittent suctioning. In this respect, open airway toileting should be performed with continuous suctioning. Mechanically ventilated infants: a closed-circuit suction should be always inline and used for endotracheal suctioning.**  
| **and ETT)**                  |                                                                                                                                                                                                         |
| **Continuous positive airway** | **Delivery room and NICU: should continue to be used as recommended by the NRP with all protective measures in place for suspected or confirmed COVID-19 cases.**  
**A viral/bacterial filter should be placed in the expiratory limb (before the water reservoir for the bubble system) or before the ventilator exhalation valve. Normally, the filter should be replaced every 8-12 hours.**  
| **pressure**                  |                                                                                                                                                                                                         |
| **Non-invasive positive pressure ventilation** | **Delivery room and NICU: is acceptable as long as all protective measures are in place for suspected or confirmed COVID-19 cases**  
**A viral/bacterial filter should be placed in the expiratory limb of the system.**  
**Note: if those measures are not available or reliable, then intubation and mechanical ventilation is a reasonable option.**  
| **Endotracheal intubation**   | **Delivery room and NICU: is the procedure associated with higher risk of contamination. Therefore, the operator should have experience and be properly protected. If possible, use a video laryngoscopy system to maintain some distance from the patent airway. Appropriately size ETT should be used to avoid excessive air leak.**  
| **Mechanical ventilation**    | **NICU: should continue to be used in the NICU as per unit protocols as long as all protective measures are in place for suspected or confirmed COVID-19 cases. There are no data to recommend a specific mode. A viral/bacterial filter should be placed on the expiratory limb before the ventilator exhalation valve (not feasible with high-frequency oscillatory ventilation). Normally, the filter should be replaced every 8-12 hours. A closed ETT suction apparatus should be used.**  

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
Specific therapy

- Specific anti-COVID-19 treatment like antivirals or chloroquine/hydroxychloroquine is not recommended in symptomatic newborns.
- Use of adjunctive therapy such as systemic corticosteroids, intravenous immunoglobulin and convalescent plasma is also not recommended in symptomatic newborns with suspected or confirmed COVID-19.
- Use of micronutrients such as Zinc, Vitamin A, C and D etc., having Immunomodulation effect can be considered.
- Only supportive care is needed, as per the problem identified.
7.9 **Counselling of Caregivers**

- Counselling should be in written document format.
- Parents/caregivers should be counseled daily telephonically or use telemedicine platform for counselling.
- If not available, then counsel a healthy caregiver in a separate room away from NICU.
- The distance between doctors and caregivers should be at least 1 m. Both parties should be wearing at least basic face masks.
- The room and surfaces should be disinfected promptly once counseling is done.
- If opportunity for antenatal counseling is available, then parents should be preemptively counseled about plan of action including general care, feeding, testing, isolation, prognosis, and finances (as per the hospital policy).
- Options should be discussed about where and by whom the baby will be cared. Pros and cons of both the options whether cared by healthy caregiver or by mother/father should be discussed, and a decision should be arrived upon.
- **Uninfected individuals > 60 years of age (e.g., grandparents) & those with co-morbid conditions should not be assigned to provide care if possible.**
- Caregiver should be using strict contact and droplet precautions while caring for babies who are stable. They should wear PPE including mask, gloves, and gown, and wash their hands frequently.
- The baby should be kept on a separate bassinet or bed at least 1 m from caregiver’s bed while baby is sleeping.
- Caregiver should be trained in basic monitoring of baby and identification of danger signs.
- Parents/caregiver should be counseled regarding feeding of newborn. Pros and cons of each choice of feeding, whether breast feeding/formula/pasteurized mother’s own milk, or donor milk, should
be discussed. A collective decision should be reached upon after discussion with parents or caregivers.

- Precautions to be taken by mother or caregiver during feeding should be explained in detail.
- Contact precautions with use of gloves should be taken while changing the soiled diapers. The diapers should be discarded as biohazard.
- Bathing can be done as for normal neonate (If possible try to avoid for first 3 days). Clothes should be washed in detergent and hot water and dried completely before use.
- Importance of micronutrients to be emphasized to the caregivers.
- Baby should be roomed-in with mother once she is negative for COVID-19.
- They should be counseled about prognosis that most babies with mild symptoms will come out of this infection; however, one should customize according to the severity of condition of the affected baby.

Some people do use faceshield for the baby, but universally it is not recommended
# Self Declaration & Consent form for Undergoing Treatment during COVID-19

<table>
<thead>
<tr>
<th>Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CR No</td>
<td></td>
</tr>
<tr>
<td>Date of admission</td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>Email id</td>
<td></td>
</tr>
</tbody>
</table>

## Self-declaration by Parents/ Attendants

<table>
<thead>
<tr>
<th>Do you have</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cough</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain in throat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body pain/fatigue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of smell/taste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travelled internationally in last 14 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travelled within India in last 14 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any family member COVID+ or in quarantine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Consent for Undergoing Treatment During COVID -19 Pandemic

I/We .................................................................knowingly consent to get treatment for my baby during COVID-19 pandemic in .............................................(Institute)

I/We have been explained that COVID-19 is a highly communicable disease and the risks associated with spread of it.
I/We have also been informed about the precautions being taken by the hospital in the prevention of transmission of infection among patients and staff and I give my consent to comply with those norms.

To the best of my knowledge, I/We are free from the aforementioned symptoms but during the course of hospital stay if the baby, parents, or close relatives may show symptoms or become COVID-19 positive, in that case, everyone mentioned above will be tested/quarantined as per the government guidelines.

I/We understand and acknowledge that even after all the proper precautions, no assurance can be guaranteed regarding disease transmission to the patient or clinical outcome in case the baby gets infected with the COVID-19.

Parent's signature: 
Parent's name: 
Doctor's name: 

Date: 
Time: 

Once COVID-19 positive mother gets admitted inform higher government authorities (DC, Police, and District Health officer, BBMP / Municipal)
7.10 Management protocol for Stable and Sick Neonate

**Management of Neonate born to Suspected/Confirmed COVID-19 Mother**

**Stable Neonate**

- **Suspected COVID-19 Mother Stable Neonate**
  - If mother is willing, baby to be given to the mother. Strict hand and breast hygiene to be followed. Wear separate gown and mask while feeding.
  - **Care Area:** Isolation Room / If not available then to be cared in area for suspected cases with physical separation of 2 metres between beds and curtain.
  - A healthy care giver to be allowed to do basic care of baby with full precautions & PPE OR
  - If healthy care giver not available, baby can stay in mother’s room with baby in bassinet atleast 1 m distance and at the foot end.

- **Confirmed COVID-19 Mother Stable Neonate**
  - If mother is not willing, baby to be isolated from mother till mother’s report comes negative.
  - **Feeding:** Expressed mother’s breast milk/Pasteurised Donor milk / Formula feed by healthy care giver
  - Take verbal and written consent.
  - Multivitamin supplementation

**Counselling:**
- Avoid attendants, Telephonic counselling to be done daily

**Discharge:**
- If mother is suspected & stable neonate – no need for Viral testing
  - **Follow up**
    - Telephonic/Telemedicine

**Criteria:** ++
- Early testing may lead to false positives (e.g. if the neonate’s nares, nasopharynx and/or oropharynx is contaminated by SARS-CoV-2 RNA in maternal fluids) or false negatives (e.g. RNA may not yet be detectable immediately after exposure following delivery.

**Confidentiality:**
- Discharge:
  - If MOTHER is positive & NEONATE is negative & stable
    - If first test within 24 hours is negative, no need to do repeat test, rooming-in along with stable mother
    - Discharge by 48-72 hrs to healthy caregiver.
    - Home/ institutional quarantine (if home quarantine criteria not met)**
  - If mother does not want to take discharge & baby is roomed-in, some institutions do the 2nd test for baby after 5-14 days, due to possibility of exposure from the mother/caregivers/ ward
  - **Follow up**
    - Telephonic/Telemedicine

**Discharge:**
- If MOTHER & NEONATE is positive but stable
  - **Follow up**
    - Telephonic/Telemedicine

**Discharge:**
- If MOTHER & NEONATE is positive but stable
- **Follow up**
  - Telephonic/Telemedicine

**Criteria:** ++
- Viral Testing of the baby to be done within 24 hrs of birth if:
  - If mother is positive
  - Baby is symptomatic
  - Baby exposed to COVID-19 positive person (caregiver/ family member)
  - Serological testing – not recommended

**Follow up**
- Telephonic/Telemedicine

**Criteria:** ++
- Home quarantine look for government order

**Home isolation**
- If baby has contact with COVID-19 positive person other than mother (healthcare worker, any family member), then baby needs to be tested after 5 days of contact.

**Follow up**
- Telephonic/Telemedicine
Management of Sick Neonate of Suspected/ Confirmed COVID-19 Mother

If both mother and baby negative for COVID-19 – treat the sick neonate as per Standard NICU guidelines

Suspected/ Confirmed COVID 19 Mother Sick Neonate (PT/RDS/MAS/HIE/Surgical neonate)

Viral Testing
First test within 24 hours of birth
If first test is negative a repeat test should be done 5-14 days after birth/exposure.
However, the test should be done immediately if new symptoms (RD, lethargy, seizures, apnea, refusal to feed, diarrhea appear)
Serological testing – not recommended

Care Area:
Isolation Room in Intensive Care Unit
OR
If not available, then separate area in ICU with physical separation of 2 m between the beds and partition

Feeding:
Expressed mother’s breast milk/ Pasteurised Donor milk / Formula feed
Take verbal and written consent.
Multivitamin supplementation

Specific anti-COVID-19 treatment is not recommended in symptomatic neonates, like
1) Systemic corticosteroids
2) IVIG
3) Convalescent plasma

Respiratory Support
-Bubble CPAP or NIPPV (if needed) with head covered with headbox to prevent environmental contamination
-Invasive Ventilation: traditional
-Negative pressure room
-HEPA filters if available
-Use of aerosol box if available
-Closed ET suction
-CPAP preferred over HFNC & NIPPV
Appropriate PPE for doctors & nurses

Stepdown:
If baby becomes asymptomatic / mild-moderate symptoms (need oxygen <3 days only) step down to isolation room to healthy caregiver/ family member or stable mother

Counselling:
Avoid attendants, Telephonic counselling to be done daily

Discharge:
- In severe symptomatic baby, once baby is stable, keep the baby in isolation (with mother/caregiver/ward), Do RT-PCR & can be discharged if a single negative RT-PCR
- If baby is asymptomatic, mild to moderate symptoms were present, baby should be stable and can be discharged after 10 days no need to repeat RT-PCR (In some institutions, they do repeat the test)

Follow up:
Telephonic/Telemedicine/SOS in OPD

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
IRRESPECTIVE OF COVID-19 STATUS, DISCHARGE CRITERIA

For neonates > 2.0 Kg
1. Mother is confident in taking care of the baby
2. Mother is able trained well in feeding the neonate and is able to give direct breast feeds and spoon feeds of expressed breast milk if necessary
3. Neonate is stable, is feeding well, able to maintain normal temperature in room air
4. No significant jaundice
5. Birth vaccination given (BCG, OPV-zero dose, Hepatitis B)
6. Proper discharge counselling has been given to the parents {Immunization schedule, follow up visit (2 weeks of age, or earlier, if the baby becomes sick), danger signs etc.}

For neonates < 2.0Kg
1. Mother is confident in taking care of the baby
2. Mother is trained well in feeding the neonate and is able to give direct breast feeds and paladai feeds of expressed breast milk
3. Consistent weight gain is noted especially in VLBW neonates
4. Neonate is stable, is feeding well, normal vitals and without any respiratory support.
5. Able to maintain normal temperature at room temperature with proper clothing.
6. No significant jaundice
7. KMC is being practised
8. Proper discharge counselling has been given to the parents {ROP screen, immunisation schedule, follow up visit (2 weeks of age, or earlier, if the baby becomes sick), danger signs etc.}

7.11 Isolation in Postnatal ward (for COVID-19 Suspected/Confirmed mother)
- Daily morning and evening rounds to be done by Isolation ward PGs/ faculty to address common problems faced by postnatal mothers and to assess baby’s daily condition, look for jaundice and danger signs.
- For effective use of PPEs, rounds can be done when delivery call is given (post donning, prior to LSCS call labour ward call)

Any signs & symptoms noted in the baby, requiring NICU Care

Mother swab awaited
- Shift to Isolation NICU
- Send relevant investigations and manage accordingly

Mother swab negative
- Shift baby to OUTBORN NICU and manage accordingly.
  - Avoid attendants, Telephonic counselling to be done, discharge from outborn NICU directly once stable.

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
7.12 Symptomatic Outborn baby requiring NICU admission

- From Hotspot/containment zone
- Postnatal exposure to COVID infected Mother other COVID positive case
- Presenting with respiratory distress with without fever and cough, onset beyond 48-72h of age and no alternative explanation for the illness

Admit and Stabilise in Isolation NICU

if attenders are to be quarantined

Follow Testing Protocol for Baby

POSITIVE

NEGATIVE

Managed by Isolation PG
Send attenders to Screening OPD

If attenders are to be quarantined

Baby to be kept in Isolation NICU

FOLLOW TESTING PROTOCOL FOR THE BABY

Shift baby to OUTBORN NICU and manage accordingly.

Avoid attendants, Telephonic counselling to be done, discharge from outborn NICU directly once stable.

Throat swab should be taken in the following cases:
- Death of a symptomatic neonate in isolation NICU born to COVID-19 positive mother
- Brought dead neonate born to a suspected/confirmed COVID-19 mother
- Neonate who is born to a suspected or confirmed COVID-19 positive mother,
- Symptomatic neonate who came to emergency ward whose mother is having symptoms of COVID-19 (send for COVID test of mother & father also)

WORK ENVIRONMENT IN ICU/ISOLATION FOR STAFF

The Doctors, nursing and other support staff working in these isolation rooms should be separate from the ones who are working in regular NICU/SNCU. The staff should be provided with adequate supplies of PPE. The staff also needs to be trained for safe use and disposal of PPE.
Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO

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7.13 Retinopathy of prematurity (ROP) screening and treatment during COVID-19

- Retinopathy of prematurity is a time sensitive blinding eye condition of premature neonates. Neonates require regular retinal examinations over many weeks.

- If sight threatening ROP is observed, i.e. 'type I' ROP, then urgent treatment is required as soon as possible and no longer than 48 hours after identification of treatment-warranted ROP in order to prevent progression to retinal detachment.

COVID-19 presents the following risks to ROP screening and care:

- Staff shortages may impact ROP trained nursing staff, ROP coordinators, ROP screeners and treaters.

- Shortage of SNCU beds, units getting converted to COVID units precluding timely admissions

- Parents of neonates may be unable to bring their baby to hospital for scheduled screening if they are ill or self-isolating, resulting in delay to identification and treatment of type-1 ROP and poorer outcomes.

Actions to take:

- Check if the neonatal unit is functioning and if the screener/team is available

- Screening for infants with conjunctivitis must be deferred as it may be a sign of COVID-19 infection

- The Indian ROP society’s guidelines for modified follow-up and treatment during the pandemic must be followed which depends on the retinal findings

- In follow-up cases mothers should maintain social distance while awaiting their infants getting dilated/screened and should place the infant on a sanitized surface and walk away. The screener walks towards the baby and examines with either the retinal camera or indirect ophthalmoscopy
• Dilating drops must be used without contact with the eye/eye lid of the infant. All drops must be discarded at the end of the screening session/day whichever is earlier

• If a retinal camera is used – the lens should be cleaned with disposable alcohol swabs between each case. If a 20 D lens is being used, the rim / lens must be washed with soap and water and alcohol swabs must be used on the rim of the lens

• PPE, hand sanitation protocols and sterile instruments must be used during screening or treatment sessions

• Laser treatment is preferred over anti-VEGF injections during the period but is subject to the discretion of the ROP specialist

• Retinal surgeries for stage 4 A and B may be considered if needed. Stage 5 ROP surgery is not an emergency during the pandemic

• In view of the new telemedicine guidelines issues by the Government of India, wherever possible, image-based screening must be carried out and reviewed and reported by ROP specialists using a tele-medicine platform

• Treatment especially in the outreach and peripheral centers pose logistic challenges. All possibilities including transport of the infant to the closest ROP center, specialist travelling to the center/zonal headquarters must be explored

• Follow-up schedules have been modified by the Indian ROP Society and broadly have reduced the frequency to a bare minimum without endangering the safety to reduce missed disease and poor outcome.

**Follow-up suggestions by Indian ROP Society for the pandemic period**

<table>
<thead>
<tr>
<th>Finding in either eye with respect to zone</th>
<th>Next follow up</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immature retina in zone 3 and zone 2 anterior</td>
<td>3-4 weeks or more</td>
<td>If the PMA is less then 34 weeks / &lt; 1500 grams / sick and admitted infant, consider a closer follow-up</td>
</tr>
<tr>
<td>Zone 3 and Zone 2 anterior disease</td>
<td>3-4 weeks</td>
<td>Spontaneously regressing ROP can be watched</td>
</tr>
<tr>
<td>Zone 2 Posterior disease</td>
<td>2 weeks</td>
<td>Unless associated with treatment requiring features (see below)</td>
</tr>
<tr>
<td>Zone 1 disease</td>
<td>1 week or treat</td>
<td>Have a low threshold for treatment</td>
</tr>
<tr>
<td>Pre-plus</td>
<td>Consider early treatment or early follow-up if pupil does not dilate well and media is not clear</td>
<td>Individualize for each case based on the tempo of disease and PMA</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pre-plus</td>
<td>With good pupillary dilatation and clear media and other low risk features</td>
<td>Can delay the next screening by an additional 1 week from the current guidelines</td>
</tr>
</tbody>
</table>

**Treatment suggestions by Indian ROP Society for the pandemic period**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1 ROP (ETROP)</td>
<td>Treat as soon as you possible, preferably on the day that screening was done. Laser recommended</td>
</tr>
<tr>
<td>APROP</td>
<td>Treat ASAP. Laser if disease is amenable. Intravitreal injections can be used, but caution to be exercised since follow-up may be a critical issue with travel restrictions for the family</td>
</tr>
<tr>
<td>Less than Type 1 ROP Stage 2 with pre plus, Stage 3 with no or early plus, high risk for APROP (but not yet full fledged), borderline Zone 1 disease / poor pupil dilatation, unclear media with pre-plus</td>
<td>Given the difficulty to closely follow-up consider treatment a ‘little earlier’ than classical Type 1 ROP</td>
</tr>
<tr>
<td>Stage 4A and 4B ROP</td>
<td>Surgery must be performed as soon as treating ROP specialist feels it is required with adequate precautions taken while providing anesthesia (as per WHO guidelines)</td>
</tr>
<tr>
<td>Stage 5 ROP</td>
<td>Surgery is not urgent. Case-to-case based decision must be considered.</td>
</tr>
</tbody>
</table>
8. FEEDING GUIDELINES

8.1 Introduction

- Nothing is more humanized and natural for the baby than providing feeding with human milk to all babies. The milk of a mother should be given to her baby because milk is not only species specific, it is indeed baby-specific!
- The benefits of breast feeding outweigh the risk of transmission of COVID-19 infection
- Reassure and support all mothers to initiate and continue to breastfeed their infants.
- Appropriate precautions should be followed to prevent transmission of infection to the neonate.

8.2 Importance of Breastfeeding

![Image of maternal COVID-19 asymptomatic/mildly symptomatic mother with preventive measures]

- Respiratory infection with SARS CoV 2 in the mother
- Maternal & Cellular immune response
- sIgA Antibodies from mother
- Passive immunity from mother for SARS CoV-2

Surgical mask use for source containment
- Meticulous hand washing
- Separation in between feeds to reduce exposure
- Clean the breast with soap and water before every feed
- Clean environment daily
8.3 Guidelines

National and international organizations guidance - Newborn care location and breastfeeding with COVID-19

<table>
<thead>
<tr>
<th>Organization</th>
<th>Location of newborn care</th>
<th>Breastfeeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO</td>
<td>Rooming-in with mother</td>
<td>Breastfeeding</td>
</tr>
<tr>
<td>AAP</td>
<td>Separation</td>
<td>Expessed Breastmilk</td>
</tr>
<tr>
<td>CDC</td>
<td>Case to case decision</td>
<td>Case to case decision</td>
</tr>
<tr>
<td>RCPCH, UK</td>
<td>Rooming-in with mother</td>
<td>Breastfeeding</td>
</tr>
<tr>
<td>FOGSI, NNF, IAP India</td>
<td>Rooming-in with mother</td>
<td>Breastfeeding</td>
</tr>
</tbody>
</table>

![Maternal Recommendations Diagram](image)

**COVID-19 +**

- **Mother is asymptomatic or displays few symptoms**
  - Rooming in + Direct breast feeding

- **Mother has cough, fever, dyspnea OR Newborn needs ICU care**
  - Mother - Infant Separation + Infant given expressed breast milk

Still recommended: - Handwashing prior to handling infant
- Mask during breastfeeding/contact
- 6 foot distance when not feeding
- Suspend visitors

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
8.4 Precautions

8.5 Kangaroo Mother Care (KMC)

KMC for Covid-19 positive neonates not only help them accrue all the stated benefits of KMC but also may prove to be of special use in allaying mother’s anxiety in this special situation.

The indications, preparation, procedure, monitoring precautions and follow-up for KMC remain the same as that for Non-COVID neonates requiring KMC with the following precautions:

- Washing of hands before and after KMC for 40-60mins, as per WHO hand-washing technique. There is no need for mother or any other care giver to clean the chest area with a special disinfectant as long as a good regular bath has been taken by them.

- Cleaning and disinfecting the surfaces around the neonate regularly before and after the requisite care `bundle` has been delivered.

- Mother or any other caregiver administering KMC should wear a mask for preventing accidental droplet transmission, apart from being educated on cough and sneeze hygiene.
Infographic showing the approach to neonates born to mothers with suspected or confirmed COVID-19. DR, delivery room; EBM, expressed breast milk; OR, operating room; PAPR, powered air-purifying respirator; PPE, personal protective equipment; SARS-CoV-2, severe acute respiratory syndrome–coronavirus 2. Image Courtesy: Satyan Lakshminrusimba. (With some changes)
9 INFECTION PREVENTION AND CONTROL(IPC) FOR COVID-19

9.1 Standard precautions

General Precautions

1. All health care personnel working can be done-in to hospital scrubs (if provisions are available)
2. Restrict the use of mobile phones, laptops inside the NICU
3. Limit your personal belonging inside NICU (like wallet, watches).
4. 100 % hand hygiene compliance to be ensured.
5. Proper hand washing is the key to the prevention of infections. Follow all the steps of hand hygiene.
6. Use non-dominant hand for opening doors, switching on and off the fans, warmers, lights.
7. Social distancing of minimum 1 meter should be maintained between the team members (doctors/nurses/support staff, mothers and patient attendants).
8. Counselling area to be shifted to the main entrance of NICU or a suitable place where you can maintain social distance norms
9. Restrict patient attendants’ entry inside the NICU.
10. Instruct the mothers and patient attendants to do hand washing before entering the NICU and wear mask
11. Labelled Milk containers with expressed milk should be carried into NICU after surface cleaning
12. Keep the neonates born to mothers with suspect/confirmed COVID-19 status in a separate designated area. If possible separate entry and exit can be facilitated to this area

Hand hygiene:
Best way to prevent the spread of germs in the health care setting and community

Our hands are our main tool for work as health care workers- and they are the key link in the chain of transmission
Use appropriate product and technique
- Soap and water
- Wash hands for 40–60 seconds!
- Alcohol-based hand rub when tap and running water is not available
- Rub hands for 20–30 seconds! When hands are visibly dirty or contaminated with proteinaceous material, always use soap, running water and single use tissue paper
STEPS OF HANDWASHING

**STEP 1** - With soap, rub the palms of your hand together

**STEP 2** - Right palm over back of Left hand & Left palm over back of Right hand

**STEP 3** - Palm to palm, fingers interlaced

**STEP 4** - Backs of fingers to opposing palms with fingers interlaced

**STEP 5** - Grasp your thumb with the opposing palm and rub while rotating

**STEP 6** - With clasped fingers, rotationally rub each hand onto the opposing palm
Personal Protective Equipment:
1. Staff caring for suspected and confirmed COVID 19, should follow strict precaution measures
2. Donning and doffing areas to be ear marked near the NICU
3. Follow the protocol of Donning and Doffing

Respiratory protection
- Triple layered surgical mask.
- N95 facemasks.
- These are needed when performing an aerosol-generating procedure or in an area where neonates are being provided respiratory support by CPAP device/ventilator.

Eye protection
- Goggles (will not be usable by those using vision glasses) or face shield.

Body protection
- Long-sleeved water-resistant complete gown including head and shoe cover. A single piece head to toe water resistant body cover will be ideal for attending resuscitation in delivery room or OT.
- Hand protection
- Well-fitting gloves.

The use of following PPE is recommended according to the risk profile:

<table>
<thead>
<tr>
<th>Area of Care</th>
<th>Risk Profile</th>
<th>PPE Recommended</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>NICU – Level I</td>
<td>Low risk</td>
<td>Triple layered mask Latex examination gloves</td>
<td>Non aerosol generating activities</td>
</tr>
<tr>
<td>NICU – Level II &amp; III</td>
<td>Moderate risk</td>
<td>N95 mask Goggles / Face shield Sterile latex gloves PPE gown</td>
<td>Aerosol generating activities such as Intubation, Extubation, Suctioning, CPAP, HFO, High flow nasal cannula</td>
</tr>
<tr>
<td>Labour room/ OT For resuscitation</td>
<td>Moderate risk</td>
<td>N95 mask / Triple layer medical mask Goggles / Face shield Sterile latex gloves,PPE gown</td>
<td>If mother is suspected COVID-19</td>
</tr>
</tbody>
</table>
Putting on (Donning) Personal Protective Equipment (PPE)

1. **HAND HYGIENE**
   - A. Using an alcohol-based hand rub is the preferred way to clean your hands.
   - B. If your hands look or feel dirty, soap and water must be used to wash your hands.

2. **Gown**
   - A. Make sure the gown covers from neck to knees to wrist.
   - B. Tie at the back of neck and waist.

3. **Procedure/Surgical mask**
   - A. Secure the ties or elastic around your head so the mask stays in place.
   - B. Fit the moldable band to the nose bridge. Fit snugly to your face and below chin.

3b. **N95 respirator**
   - There are different styles of N95 respirators (pictured below). They include:
     a) molded cup, b) duckbill, c) flat-fold and d) v-fold
     - a
     - b
     - c
     - d
   - All styles have the same basic steps for donning; molded cup and duckbill are pictured below. Refer to the manufacturer for specific donning instructions.

4. **Eye protection or face shields**
   - Place the lenses (or face).
   - Adjust to fit.

5. **Gloves**
   - Pull the cuffs of the gloves over the cuffs of the gown.
Taking off (Doffing) Personal Protective Equipment (PPE)

1. Gloves
   - A. Grasp the outside edge of the glove near the wrist and peel away from the hand, turning the glove inside-out.
   - B. Hold the glove in the opposite gloved hand.
   - C. Slide an ungloved finger or thumb under the wrist of the remaining glove.
   - D. Peel the glove off and over the first glove, making a bag for both gloves.
   - E. Put the gloves in the garbage.

2. HAND HYGIENE
   - A. Using an alcohol-based hand rub is the preferred way to clean your hands.
   - B. If your hands look or feel dirty, soap and water must be used to wash your hands.

3. Gown
   - A. Carefully unfasten ties.
   - B. Grasp the outside of the gown at the back of the shoulders and pull the gown down over the arms.
   - C. Turn the gown inside out during removal.
   - D. Put in hamper or, if disposable, put in garbage.

4. HAND HYGIENE
   - A. Clean your hands. (See No. 2)
   - B. Exit the patient room, close the door and clean your hands again.

5. Eye protection or face shield
   - A. Handle only by headband or ear pieces.
   - B. Carefully pull away from face.
   - C. Put reusable items in appropriate area for cleaning.
   - D. Put disposable items into garbage.

6. Mask or N95 respirator
   - A. Bend forward slightly and carefully remove the mask from your face by touching only the ties or elastic bands.
   - B. Start with the bottom tie, then remove the top tie.
   - C. Throw the mask in the garbage. There are different styles of N95 respirators but all styles have the same basic steps for donning.

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
# VARIOUS TYPES OF MASKS

<table>
<thead>
<tr>
<th>Type of Mask</th>
<th>Feature</th>
<th>Benefit</th>
<th>Disadvantage</th>
<th>Approx. Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust mask</td>
<td>Disposable, molded face mask made of paper pad</td>
<td>Protection against non-toxic dust</td>
<td><strong>Does not offer any protection against airborne pathogen such as Coronavirus</strong></td>
<td>Rs.60/-</td>
</tr>
<tr>
<td>Single layer face mask</td>
<td>Consists of a single layer of wood pulp tissue paper or non-woven fabric</td>
<td>Used commonly in the food processing industry</td>
<td><strong>Not recommended</strong> for protection against coronavirus transmission Should not be reused as it is a single use item and cannot be washed</td>
<td>Rs.3/-</td>
</tr>
<tr>
<td>Cloth mask</td>
<td>100% cotton made</td>
<td>Practical for General public Available in the market and can even be made at home</td>
<td>Two to three layers of cloth is optimal as increasing layers can improve efficacy but makes breathing difficult</td>
<td>Rs.60-200/-</td>
</tr>
</tbody>
</table>

**Dust mask**

**Single layer face mask**

**Cloth mask**
<table>
<thead>
<tr>
<th>Type of Mask</th>
<th>Feature</th>
<th>Benefit</th>
<th>Disadvantage</th>
<th>Approx. Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Three layered surgical mask</strong></td>
<td>Most commonly used&lt;br&gt;It consists of 3 layers:&lt;br&gt;The <strong>inner layer</strong> has absorbent property to <strong>absorb moisture from exhaled air</strong>.&lt;br&gt;The <strong>middle layer</strong> acts as a <strong>filter</strong> and is made up of nonwoven mat of thin fibre or melt blown (The melt blown process is a nonwoven manufacturing system) material. The <strong>outer most layer repels liquid</strong>.</td>
<td>Have pleats to increase the surface area&lt;br&gt;Disposable Prevents the release of respiratory emissions from the user into their immediate environment</td>
<td>Not protective to wearer against airborne infection</td>
<td>Rs 6-60/-</td>
</tr>
<tr>
<td><strong>Respirator mask</strong>*</td>
<td>Tight fitting&lt;br&gt;Provide two way protection by filtering both outflow as well as inflow of air&lt;br&gt;Filters are made from flat and nonwoven mats of thin fibers made of material like wool felt, fiberglass paper or polypropylene. Most important layer is <strong>melt blown layer</strong> for filtration. The quality of mask depends on the quality of this layer and electrostatic charge over heat. Efficiency of the filter depends on the <strong>diameter of individual fibers</strong>, the ratio of open space to fibers termed <strong>porosity</strong> and overall <strong>thickness of the filter</strong>. Four functional mechanisms which enable them to capture aerosol particles. these are: <strong>Interception</strong>&lt;br&gt;<strong>Inertial impaction</strong>&lt;br&gt;<strong>Diffusion</strong>&lt;br&gt;<strong>Electrostatic attraction</strong>&lt;br&gt;***</td>
<td>Protect the wearer from airborne particles</td>
<td>Uncomfortable to wear</td>
<td>Rs 400/-</td>
</tr>
<tr>
<td><strong>Respirators with expiratory valve</strong></td>
<td>Expiratory valve included to increase comfort&lt;br&gt;Exhaled air is not passing through the filter but getting out through the valve</td>
<td>Makes it easier to exhale and also less moisture build up inside the</td>
<td>It doesn’t protect the environment if the person wearing this mask is already infected by a respiratory pathogen. (When used, wearer should be instructed to wear surgical mask over respirator with expiratory valve)</td>
<td>Rs 750-1200/-</td>
</tr>
<tr>
<td><strong>Powered air-purifying respirator (PAPR)</strong></td>
<td>A battery-powered fan is used in these respirators to make air flow through a filter and facilitate easier breathing</td>
<td>Reduces heat related stress&lt;br&gt;Easy breathing</td>
<td>Expensive&lt;br&gt;Difficulty in communication because of noise of the fan and risk of contamination during doffing</td>
<td>Rs 28000-1.5lakhs (based on specifications)</td>
</tr>
</tbody>
</table>

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| **Elastomeric respirators** | Half-face piece, tight-fitting respirators that are made of synthetic or rubber material. Equipped with replaceable filter cartridges. | Can be repeatedly disinfected, cleaned, and reused. | Should not be used without a surgical mask over it due to concerns that air coming out of the exhalation valve may contaminate the surrounding area. |

---

- Elastomeric respirators
- Three layered surgical mask
- Respirator mask
- Respirator mask with expiratory valve
- Powered air-purifying respirator (PAPR)
- 3m Particulate Filter P100 Round HEPA Filter 2091 2097 Used with 3m Face Mask 6200 7502 6800

Key features:
- can reuse for no more than 40 hours or 30 days
- relieve any particle including oil-based liquid aerosols
- At least 99.97% filter efficient
KAWWACH Ultimate face guard, designed & developed in India in association with engineers and approved by doctors in ease of long term usage day to day usage. (Available online for purchase)

Salient Features:-
- 4-in-1 Protection - covers ears, eyes, nose mouth.
- Avoids accidental touch of face
- Easy to use with spectacles
- Easy to use with mobiles & cellphones, without any risk of touching the ear.
- Anti fogging shield (until washed)
- Dual respirators for easy breathing
- Lab tested and approved by FDA, WHO-GMP, EU, ISO.

This is the best mask available in a cost effective setting. Respirator mask with an expiratory valve should be used along with a surgical mask over it, so as to protect oneself as well as to prevent environmental spread. Recently Govt. of India issued a warning against the use of respirator mask with expiratory valve, as it does not prevent virus spread and are ‘detrimental’ to the measures adopted for its containment.
*Filtering efficacy of respirators:*

Based on rating by different institutions such as CDC and European Committee for Standardization, masks are labelled.

The mask with **CDC 95 rating** can collect at least **95% of the aerosol particles** and doesn’t allow them to pass through.

**CDC 99 rating** means at least **99% aerosol particles** get filtered out and there are even respirators with **CDC100 rating** which can filter **almost 100%** (practically up to 99.7%) of aerosol particles.

Oil can impact the efficacy of the filter used in these masks as **electrostatic charges** in the filter media can change on contact with oil. This gives rise to another rating based on permeability of oil. These are ‘N ‘meaning not resistant, ‘R’ meaning resistant but not absolute while ‘P’ meaning oil proof or strongly resistant.

**First two mechanisms namely inertial impaction interception and electrostatic attraction are responsible for obstructing and filtering larger particles.**

**Diffusion mechanism** is responsible for collecting particles measuring 0.1 mm and smaller which have constant Brownian motion leading them to collide with the filter fiber. **Electrostatic attraction** which relies on attraction between the charged fibers and particles with opposite charge. This is very important for filter efficiency as it improves efficiency in particle collection without increasing resistance of breathing.

**NIOSH certified respirator**

**Identification of NIOSH certified respirator:** National Institute for Occupational Safety and Health (NIOSH) approves all respirators used in healthcare settings to ensure standards of quality and performance. Only NIOSH authorized manufacturer can use the NIOSH logo or NIOSH name in block letters or on respirator.

An established quality program to ensure respirator meeting the NIOSH requirements is expected from manufacturer. NIOSH website has a list of approved respirators buyer can verify this at the website: [http://www.cdc.gov/niosh/npptl/topics/respirators/disp](http://www.cdc.gov/niosh/npptl/topics/respirators/disp).

The (FFP) “filtering face piece” score comes from EN standard 149:2001, EN 143 standard covers P1/P2/P3 ratings. Both standards are maintained by CEN ([European Committee for Standardization](http://www.cdc.gov/niosh/npptl/topics/respirators/disp)).

<table>
<thead>
<tr>
<th>Respirator Standard</th>
<th>Filter Capacity (removes x% of of all particles that are 0.3 microns in diameter or larger)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFP1 &amp; P1</td>
<td>At least 80%</td>
</tr>
<tr>
<td>FFP2 &amp; P2</td>
<td>At least 94%</td>
</tr>
<tr>
<td>N95</td>
<td>At least 95%</td>
</tr>
<tr>
<td>N99 &amp; FFP3</td>
<td>At least 99%</td>
</tr>
<tr>
<td>P3</td>
<td>At least 99.95%</td>
</tr>
<tr>
<td>N100</td>
<td>At least 99.97%</td>
</tr>
</tbody>
</table>

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9.2 Environmental Cleaning and Disinfection

General Principles

- Healthcare environment contains a diverse population of microorganisms but only few are significant pathogens
- Microbiologically contaminated surfaces can serve as reservoirs of potential pathogens
- Transfer of microorganisms from contaminated surfaces to patients/staff is mostly via hand contact with the surface
- Hand hygiene is important to minimize the impact of this transfer
- Cleaning and disinfecting environmental surfaces is fundamental in reducing healthcare-associated infections

**COVID-19 virus can potentially survive in the environment for several hours/days**

- Premises and areas potentially contaminated with the virus to be cleaned before their re-use
- Products containing antimicrobial agents known to be effective against coronaviruses may be used
- Established cleaning strategies to be used
- Remove the majority of bioburden
- Disinfect equipment and environmental surfaces
## Housekeeping Practices

<table>
<thead>
<tr>
<th>Cleaning solution</th>
<th>Concentration</th>
<th>Method of preparation</th>
<th>Site of application</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl alcohol</td>
<td>70 %</td>
<td>Readily available</td>
<td>Reusable equipment and small area cleaning (e.g. table top) Laryngoscope, stethoscope, measuring tape and probe tip.</td>
<td>Daily and also after each use</td>
</tr>
<tr>
<td>Sodium Hypochlorite 5%</td>
<td>0.5% (5000 ppm)</td>
<td>1:9 ratio (eg. 1 liter of Sodium hypochlorite + 9 liter of water)</td>
<td>Wall and floors</td>
<td>Once per shift Avoid dry dusting and sweeping</td>
</tr>
<tr>
<td>Hydrogen peroxide (H2O2)</td>
<td>10 % v/v</td>
<td>100 ml of H2O2 + 900 ml of water</td>
<td><strong>Surface disinfection</strong> - Incubators, open care systems, infusion pumps, weighing scales, standby equipment-ventilators, monitors, phototherapy units, and shelves <strong>May be used for fumigation</strong></td>
<td>Contact period of 1 hour required for efficacy</td>
</tr>
<tr>
<td>Glutaraldehyde (Cidex)</td>
<td>2%</td>
<td>Add activators to the jar of the Glutaraldehyde solution. Do not use activated solution beyond 14 days.</td>
<td>Resuscitation bag and mask, Suction tubes</td>
<td>Contact period 6-8 hours</td>
</tr>
<tr>
<td>Phenol or Lysol</td>
<td>3% 5%</td>
<td>Readily available</td>
<td>Cot, mattresses, Suction bottle, Wall, Sink Floor</td>
<td>-</td>
</tr>
<tr>
<td>Detergent</td>
<td>-</td>
<td>Readily available</td>
<td>Radiant warmer, Canopy, mattresses, oxygen hood</td>
<td>-</td>
</tr>
</tbody>
</table>
## House Keeping Protocols for Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Disinfectant</th>
<th>Frequency of Cleaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Radiant Warmer Canopy and Mattress</strong></td>
<td>Detergent solution</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thorough cleaning after every discharge</td>
</tr>
<tr>
<td><strong>Cots and Mattresses</strong></td>
<td>3% Phenol or 5% Lysol</td>
<td>Daily</td>
</tr>
<tr>
<td><strong>Suction apparatus</strong></td>
<td>Should contain 3% Phenol or 5% Lysol</td>
<td>Daily</td>
</tr>
<tr>
<td>Suction bottle</td>
<td>Bottle to be cleaned with detergent</td>
<td>Change suction tube daily</td>
</tr>
<tr>
<td></td>
<td>Flushed with water and soak maintenance</td>
<td>Use disposable suction catheter</td>
</tr>
<tr>
<td>Suction tube connected to the bottle</td>
<td>Soak for disinfection with 2% Glutaraldehyde</td>
<td>Daily</td>
</tr>
<tr>
<td><strong>Oxygen hood</strong></td>
<td>Detergent</td>
<td>Daily and after each use</td>
</tr>
<tr>
<td><strong>Resuscitation bag and mask</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mask</td>
<td>Detergent 2% Glutaraldehyde</td>
<td>Disinfect daily and sterilize weekly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clean with detergent daily after each use</td>
</tr>
<tr>
<td>Bag</td>
<td>Detergent 2% Glutaraldehyde</td>
<td>Immerse in 2% Glutaraldehyde for 6-8 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rinse with clean water and dry with sterile linen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(washed and sun dried)</td>
</tr>
<tr>
<td><strong>Laryngoscope</strong></td>
<td>70% isopropyl Alcohol</td>
<td>Wipe after each use</td>
</tr>
<tr>
<td><strong>IV Equipment</strong></td>
<td></td>
<td>Disposable</td>
</tr>
<tr>
<td>Disposable needles and infusion set</td>
<td></td>
<td>Changed every 24 hours</td>
</tr>
<tr>
<td>Feeding utensils</td>
<td>Soap and water</td>
<td>Clean with soap and water and boil for 10 minutes before each use</td>
</tr>
<tr>
<td><strong>Thermometer</strong></td>
<td>Alcohol</td>
<td>Wipe with alcohol after use. Store in bottle containing dry cotton</td>
</tr>
<tr>
<td>Stethoscope, measuring tape and probe tips</td>
<td>70% Isopropyl Alcohol</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whenever being used for another baby</td>
</tr>
<tr>
<td><strong>Walls and sink</strong></td>
<td>3% Phenol or 5% Lysol</td>
<td>Cleaning once a day</td>
</tr>
<tr>
<td><strong>Floor</strong></td>
<td>3% Phenol or 5% Lysol</td>
<td>Wet mopping should be in each shift (3 times a day)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Avoid sweeping and dry dusting</td>
</tr>
<tr>
<td>Cleaning of spill</td>
<td>10 gram of bleach in 1 litre of water</td>
<td>Cover the area with solution for 20 minutes and mop with newspaper or cloth</td>
</tr>
<tr>
<td><strong>Needles and sharp</strong></td>
<td>Polar bleach</td>
<td>Discard in polar bleach in a needle-proof container</td>
</tr>
<tr>
<td>Cup, spoon and paladai</td>
<td>-</td>
<td>Should be boiled for 15 minutes before each use</td>
</tr>
</tbody>
</table>
9.3 Biomedical Waste Management

BMW guidelines COVID-19

COVID-19 Isolation wards: (isolation wards are those where COVID-19 positive patients are being kept for treatment/ diagnosis)

- Healthcare Facilities having isolation wards for COVID-19 patients need to follow these steps to ensure safe handling and disposal of biomedical waste generated during treatment;
- Keep separate colour coded bins/bags/containers in wards and maintain proper segregation of waste as per BMWM Rules, 2016 as amended and CPCB guidelines for implementation of BMW Management Rules.
- As precaution double layered bags (using 2 bags) should be used for collection of waste from COVID-19 isolation wards so as to ensure adequate strength and no-leaks.
- Collect and store biomedical waste separately prior to handing over the same CBWTF. Use a dedicated collection bin labelled as “COVID-19” to store COVID-19 waste and keep separately in temporary storage room prior to handing over to authorized staff of CBWTF. Biomedical waste collected in such isolation wards can also be lifted directly from ward into CBWTF collection van.
- In addition to mandatory labelling, bags/containers used for collecting biomedical waste from COVID-19 wards, should be labelled as “COVID-19 Waste”. This marking would enable CBWTFs to identify the waste easily for priority treatment and disposal immediately upon the receipt.
- General waste not having contamination should be disposed as solid waste as per SWM Rules, 2016.
- Maintain separate record of waste generated from COVID-19 isolation wards.
- Use dedicated trolleys and collection bins in COVID-19 isolation wards. A label “COVID-19 Waste” to be pasted on these items also.
• The (inner and outer) surface of containers/bins/trolleys used for storage of COVID-19 waste should be disinfected with 1% sodium hypochlorite solution daily.

• Report opening or operation of COVID-19 ward and COVID ICU ward to SPCBs and respective CBWTF located in the area.

• Depute dedicated sanitation workers separately for biomedical waste and general solid waste so that waste can be collected and transferred timely to temporary waste storage area.

• Faeces from COVID-19 confirmed patient, who is unable to use toilets and excreta is collected in diaper, must be treated as biomedical waste and should be placed in yellow bag/container. However, if a bedpan is used, then faeces to be washed into toilet and cleaned with a neutral detergent and water, disinfected with a 0.5% chlorine solution, then rinsed with clean water.

• Collect used PPEs such as goggles, face-shield, splash proof apron, Plastic Coverall, Hazmet suit, nitrile gloves into Red bag.

• Collect used masks (including triple layer mask, N95 mask, etc.), head cover/cap, shoe-cover, disposable linen Gown, non-plastic or semi-plastic coverall in Yellow bags.

**Labelling of BMW bags**

Label should be non-washable and prominently

| Waste category number........ | Day............. Month............. |
| Waste quantity........ | Year............ |
| senders name and address: | Date of generation............. |
| Phone number........ | Receivers’ Name and Address: |
| Fax number........ | Phone Number............. |
| Contact person........ | Fax Number............. |
| In case of emergency please contact...... | Contact Person............. |
| Name and address..... | |
| Phone No. | |

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# DISPOSAL OF BMW

<table>
<thead>
<tr>
<th>Category</th>
<th>Type of bag/container</th>
<th>Type of waste</th>
<th>Treatment disposal options</th>
</tr>
</thead>
</table>
| Yellow   | Non chlorinated colour coded Bags in colored bins | • Human anatomical waste  
• Animal anatomical waste  
• Soiled waste - items contaminated with blood or body fluids – like dressings, cotton swabs and bags containing residual blood/blood components  
• Chemical waste - chemicals used in production of biologicals  
• Micro, biotech & clinical lab waste (to be pre-treated by autoclaving before discarding):  
  • Blood bags  
  • Laboratory cultures  
  • Stocks or specimens of microorganisms  
  • Live or attenuated vaccines  
  • Human and animal cell cultures  
  • Discarded linen contaminated with blood or body fluid including mask and gown  
  • Expired or discarded medicines | Incineration/deep burial |
| Red      | Non chlorinated plastic bags in colored bins/container | • Contaminated recyclable waste  
• Waste from disposable items:  
  • Tubing and bottles  
  • Intravenous tubes and sets  
  • Catheters and urine bags  
  • Syringes (without needles), vacutainers  
  • Gloves  
  • Plastic petri-plates containing infectious material to be pre-treated by autoclaving and discarded in red bags | Auto/Micro/Hydro and then sent to recycling |
| White    | Translucent puncture, leak and tamper proof | • Sharps waste (used, discarded and contaminated metal sharps)  
• Needles  
• Syringes with fixed needles  
• Needles from needle tip cutter or burner  
• Scalpels  
• Blades  
• Any other contaminated sharps | Auto/dry heat sterilization followed by shredding/mutilation/encapsulation |
| Blue     | Puncture and leak proof boxes | • Glassware  
• Broken or discarded glass including medicine vials & ampoules (except those contaminated with cytotoxic waste)  
• Broken or discarded contaminated glass | Disinfection or Auto/Micro/Hydro and then sent to recycling |

*Disposal by deep burial is permitted only in rural or remote areas where there is no access to common bio-medical waste treatment facility. This will be carried out with prior approval from the prescribed authority.*
Transport within health-care facilities

- On-site transportation should take place whenever possible during less busy times (i.e. in the evenings or very early morning).
- Set routes should be used to prevent exposure to staff and patients and to minimize the passage of loaded carts through patient care and other clean areas.
- Depending on the design of the health-care facility, the internal transportation of waste should use separate floors, stairways or elevators from patients as far as possible.
- Regular transport routes and collection times should be fixed and reliable.
- Transport staff should wear adequate personal protective equipment (PPE) including gloves, closed shoes, overalls and masks.
- Education and training must be provided to all waste transport workers and include how to safely handle waste containers that leak or are broken.

**Note:**

- Hazardous and non-hazardous waste should always be transported separately!
- Health-care waste can be bulky and heavy and should be transported by using wheeled trolleys or carts that are not used for any other purpose.
- Waste, especially hazardous waste, should never be transported by hand due to the risk of accident or injury from infectious material or incorrectly disposed sharps that may protrude from a container.
- It is recommended that spare trolleys are available in the case of breakdowns and maintenance.
- The vehicles should be thoroughly cleaned and disinfected daily as per a written protocol.
- Separate routes for transporting hazardous and non-hazardous waste should be planned and used.
- In general, a waste route should follow the principle from “clean to dirty”.
- Collection should start from the most hygienically sensitive medical areas (e.g. intensive care, dialysis, operating theatres) and follow a fixed route around other medical areas and interim storage locations.
• The frequency of collection should be refined through experience to ensure that there are no overflowing waste containers at any time.

**Waste storage requirements**

- Infectious and sharp waste storage:
  The storage place must be identifiable as an infectious waste area by using the biohazard symbol.
- Floors and walls should be sealed or tiled to allow easy cleaning and disinfection.

Storage times for infectious waste (e.g. the time gap between generation and treatment) should not exceed the following periods:
- Temperate climate: 72 hours in winter/48 hours in summer.
- Warm climate: 48 hours during the cool season/24 hours during the hot season.
- If a refrigerated storage room is available, infectious waste can be stored for more than a week cooled to a temperature no higher than 3°C to 8°C.

**Pathological waste storage:**

- Pathological waste is considered biologically active and gas formation during the storage should be expected.
- To minimize the possibility of this happening, storage places should have the same conditions as for infectious and sharps wastes.
- Where possible, waste should be stored under refrigerated conditions.
- In some cultures, body parts are passed to the family for ritual procedures or are buried in designated places.
- Bodies should be placed in sealed bags prior to release to the family to reduce the risk of infection.

**Pathological waste disposal**

- Placenta pits can be effective in low-resource settings.
- They need to be located at specific sites to avoid contamination of groundwater, locked and fenced for security.
• Natural degradation and draining of liquid into the subsoil greatly reduces the volume of waste in the pit and facilitates the inactivation of pathogens.
• Pathological waste may be disposed of at a landfill when no other treatment options are available.
• However, disposal should be in a pre-specified area to prevent recyclers or scavengers coming into contact with the waste.
• Waste should also be covered as quickly as possible.

**Management of Specific Infectious Wastes**

Treatment of anatomical, pathological, and placental and fetal remain wastes may be bound by socio-cultural, religious, and aesthetic norms and practices

Disposal Options:
• Interment (burial) in cemeteries or special burial sites
• Alkaline digestion, especially for contaminated tissues and animal carcasses
• Burning in crematories or specially designed incinerators
• Promession (freeze drying), especially for human cadavers

Placental waste is sometimes composted or buried in placenta pits designed to facilitate natural decomposition
**10. VISITOR POLICY**

Visitor’s policy in COVID situation (in Non-COVID newborn care areas)

- Mother with suspected or confirmed COVID 19 should not be allowed to neonatal care area.
- COVID-19 mother may be allowed to visit her neonate admitted in NICU if she fulfills all of these:
  - Resolution of fever without the use of antipyretics for at least 72 hours
  AND
  - Improvement (but not full resolution) in respiratory symptoms
  AND
  - Negative results of a molecular assay for detection of SARS-CoV-2 in case of severe disease
- For neonates roomed in with mother having suspected or confirmed COVID 19, allow one healthy attendant to assist her in baby care activities after training in respiratory and hand hygiene maintenance
- If the mother is sick and cannot visit the baby due to her co- morbidities
  Unstable baby - Show the baby once daily and explain the prognosis and restrict the frequency of visits by patient attendants. Use digital technology like video calls for showing the baby multiple times.
  Stable baby fit to be taken care by the attenders - Allow single designated attendant who is symptom free (fever, cough, cold) (aged<60 years)
- The visitor should be advised about hand washing before entering into the care area
- The mother/ Visitor should wear mask (cloth/ surgical mask) throughout their stay in the NICU
- The visitor should be asked to frequently sanitize their hand using alcohol-based hand sanitizer after touching the surfaces in the NICU
- Once neonate is stable, explain to the parents and shift the baby to postnatal ward in order to restrict the entry of visitors.
- Use video-counselling facilities to limit the visitors. All visitors should be screened using a checklist for ILI
11. PLACENTAL SAMPLING

**Placenta Biopsy:**
A placental biopsy from the fetal side (a cone with a base of about 3 cm including membranes) should be obtained, washed in sterile saline solution and inserted in a sterile container with screw cap. Freeze at -80 ° (as an alternative to -20 °).

Send the sample to the reference laboratory: Molecular Biology Laboratory, Dept of Obstetrics & Gynecology

**Histological Placenta Examination:**
Should be performed on the remaining pathological samples following the Aforementioned Tissue Biopsies.

**Methods of Conservation and Transfer of A Positive COVID-19 Placenta:**
- If the structure has formalin, immerse the placenta + membranes + cord in the container with the fixative,

Seal tightly, insert the container in a plastic bag and the bag in a rigid tertiary container (as per regional provisions).

Storage and dispatch at room temperature.

- If the structure does not have formalin, insert the placenta + membranes + cord in the vacuum bag and follow the procedures already established for closing the bag itself; then put the vacuum bag in a second plastic container and the latter in a third rigid container
- Storage and dispatch better if at controlled temperature (4-6 ° C, thermal bag with ice sticks).
- Placenta + membranes + cord, both in fixative and in vacuum, must be sent to the Pathology.
12. GUIDELINES FOR ABORTION & COVID-19 DISEASE (MoHF&W)

- Reproductive health services enlists safe abortion services as essential.
- The guidance states that all appropriate health facilities should ensure provision of medical and surgical abortion services, with appropriate infection prevention measures comprising counselling for post-abortion care and provision of contraception.
- The need of the hour is to ensure that this guidance is widely disseminated and implemented across all levels of the health system – but the guidance also raises some pertinent questions on access and availability.
- Abortion in India, though legal, is highly stigmatized. It is estimated that approximately 1.5 crore abortions take place in the country every year and so the need for ensuring immediate access to safe abortions is quite established.
- Denial or delay of an abortion is not an option.
- This can lead women to seek services from an untrained provider damaging her health and body; it can also increase the burden on the health system that will have to cater to emergency complications of an incomplete abortion.
- Telling women to delay their abortion will only increase their requirement for a Late-term abortion – something that is more complicated and less available.
- However, at a time when the country is in an extended lockdown, movement is highly restricted and public transport services are not available; how is a woman in need of an abortion to reach a health facility, especially in a context where her mobility is restricted even in normal times and she does not have support for an abortion?
- Even if she manages to reach, is it safe for her to wait to see a doctor who is surely not expected to prioritize her need in these times?
- Given the nature of the pandemic and the treatment course it requires, health facilities are stretched to their limits in places where the outbreak has been significant.
- Most secondary- and tertiary-level facilities have either been converted to dedicated COVID-19 hospitals or have a considerable number of beds dedicated for it.
- Majority of doctors and nursing staff have been redeployed for care and treatment of COVID-19 patients. There has mostly been a decline in OPD
caseload across all levels of health facilities. This does not point to the gaps in the health system but is just a reiteration of the intensity of crisis we are facing.

- Telemedicine can make it possible for women to undergo legal abortions with the opinion, and under the guidance of a trained abortion provider.
- With the advent of medical abortion, providers can assess women with some key questions to determine whether they are eligible to terminate their pregnancy via medical abortion – the whole process can be contactless, safe, and legal.
- Telemedicine practice can prevent the transmission of infectious diseases reducing the risks to both healthcare workers and patients.

**Termination of pregnancy (MTP), sexual and reproductive healthcare in times of COVID-19**

- Abortion and reproductive healthcare may be affected by delayed presentations by the woman, lack of availability of providers and disruptions of the supply chain of material and drugs.
- Abortion care is essential healthcare.
- It is critical to ensure that women who seek abortion and family planning do not suffer from lack of access.
- It is well established that early abortions are safer for women and the MTP Act places limits on the gestational age for abortions.
- This makes the provision of abortion time-sensitive. It is also well established that women who seek an abortion tend to get it one way or another.
- A lack of these services may mean that women seek an abortion from unsafe providers and put themselves in harm's way.
- The services should therefore continue to be provided by public and private providers.
13. BASIC HOSPITAL RESPONSIBILITIES

It is desirable that the following facilities MUST be provided by the hospital:

1. The hospital must provide basic care for the pregnant women. In case of referral, ambulance facility and coordination with the referral center is essential.
2. A designated labor room and post-natal ward for pregnant and post-natal COVID-19 suspect /positive mothers should be identified.
3. The hospital must provide basic new born care and resuscitation for each newborn delivered.
4. Separate isolation beds /SNCU for admitting suspect / COVID -19 positive neonates must be identified by the hospital administration.
5. Mother and baby (suspect and positive) should be kept together after appropriate counselling to the parents regarding COVID-19 transmission and appropriate infection prevention.
6. Hospital should have facility to collect Nasopharyngeal swab of both mother and baby.
7. Newborn should be breast fed as per the guidelines provided.
8. Newborn should be immunized before discharge.
9. All health care workers should be trained in infection control protocol.
10. Adequate and appropriate personal protective equipment must be provided to all health care workers.
11. Adequate supply of essential medicine and basic diagnostics must be provided by the hospital.
12. Dedicated ambulances must be provided by the hospital.
Occupational health policy specific to the COVID-19 pandemic

- Healthcare workers directly involved in the care of COVID-19 patients are eligible for Hydroxychloroquine (HCQ) prophylaxis as per the ICMR guideline released on 22 March 2020. Eligible healthcare workers should contact their hospital teams for a prescription.
- Health care workers should be asked to avoid travel outside the city unless necessary.
- Health care workers who have traveled to a district in a red zone or a containment area should be home quarantined for 2 weeks from the date of arrival before allowing them to resume work.
- Health care workers who have had household members returning from international travel or another state should be asked to maintain social distancing from them.
- Health care workers who have a fever and/ or respiratory symptoms should get themselves evaluated by the local COVID19 team of physicians. They may be categorized as NOT suspect and advised home quarantine for a short period or SUSPECT and advised COVID19 testing with hospital quarantine. These policies are evolving and updated guidance from ICMR and local health authorities should be sought.
- Every pregnant healthcare worker, should have a risk assessment, which may involve occupational health. Employee should modify the work environment to limit contact with suspected or confirmed COVID-19 patients to minimize the risk of infection as far as possible.
14. ETHICAL PRINCIPLES FOR OPTIMUM CARE DURING THE COVID-19 PANDEMIC

- Ethics are central to the clinical care of COVID-19 patients in the same way that ethics pertains to all patients.

- Clinical care involves using clinical expertise to do what is best for patients within a relationship of care. This section provides a brief introduction to some of the ethical considerations that are important to remember in the context of COVID-19

Ethical considerations that affect all persons affected by COVID-19

- **Equal moral respect:** Every person is equally valuable. Treatment and care decisions should be based on medical need and not on irrelevant or discriminatory features such as **ethnicity, religion, sex, age, disability or political affiliation**.

- Patients with similar health problems or symptoms must receive equal treatment and care. Showing moral respect means involving patients and their caregivers in decision-making to the greatest extent possible, explaining options and limitations in treatment.

- **Duty of care:** Every patient is owed the best possible care and treatment available in the circumstances. Even when resources need to be rationed during a crisis, health care professionals and frontline workers have a duty of care to promote their patients’ welfare within available resources.

- Health care professionals and frontline workers are also owed a duty of care. In this regard, appropriate PPE for health care professionals and frontline workers should be provided to promote their safety and well-being. This is a benefit to them but also to the whole of society by ensuring that they are available to support the clinical response for as long as possible.

- **Non-abandonment:** It follows from consideration of equal moral respect and duty of care, that no person in need of medical care should ever be neglected or abandoned.

- Care will extend to families and friends of patients and options to maintain communication with them should be explored. Palliative care
must be accessible for all patients with respiratory failure for whom ventilatory support will be withheld or withdrawn.

- **Protection of the community:** Appropriate IPC should be in place, respected and enforced. Such actions protect patients, health care professionals and the community. During a pandemic the focus should be on both clinical care for patients and the promotion of public health.

- **Confidentiality:** All communications between patient and clinician must remain confidential except in the case of compelling public health concerns (e.g. contact tracing and surveillance etc.) or other accepted justifications for breach of confidentiality. Private individual information must be kept secure unless it is a justified breach.

*We recommend that hospitals and health systems at local, regional, national and global level plan prepare and be ready to surge clinical care capacity (staff, structure, supplies and systems) in order to be able to provide appropriate care of all COVID-19 patients and maintain essential health services*

*Allocation of scarce resources:* We recommend that each institution should establish a plan for what to do in situations of resource scarcity to cover the allocation or access to critical medical interventions (such as oxygen, intensive care beds and/or ventilators). Such a plan should establish a clear overall aim.

*Decision-making regarding allocation:* Part of planning for scarcity is ensuring that a fair system of decision-making for allocation is in place.

**Remarks:**

1. Personnel familiar with the medical triage criteria and allocation protocols, who are distinct from the clinical treating team are one option. Allocation decisions should be done according to the established plan and regularly reviewed. If necessary, there should be a reallocation of a resource that was previously allocated where it is not proving beneficial.

2. For example, the aim might be to ensure the best possible use of limited resources based upon chosen medical criteria. Triage criteria should seek to balance medical utility and equity, and ease of implementation. The same criteria should be applied for all patients with similar levels of need, regardless of COVID-19 status.
We recommend that it be clear when decision-making will move from routine allocation to pandemic allocation, so that institutions do not move too soon to restrict access in anticipation of possible future scarcity that might not arise.

Remarks:
1. It should be clear what the “tipping point” is to change to pandemic allocation (e.g. a declaration by a ministry of health, or hospitals reaching ICU bed and ventilator capacity). This should take into account maximizing surge clinical capacity.
2. Whatever method is chosen should be subject to a fair process, such as using the following procedural principles:
   - **Inclusiveness:** Input should be obtained from the most affected population(s).
   - **Transparency:** The mechanism should be easily accessible and understandable at an elementary school level and in all major languages in the institution’s catchment area.
   - **Accountability:** A mechanism should be available to review the application of an approved triage protocol, or requests to review a particular decision, in light of novel or updated clinical information or other concerns.
   - **Consistency:** Allocation principles should be applied consistently.

We recommend that caregivers should be:
- Given access to adequate training in caregiving, including IPC.
- Given access to appropriate and adequate PPE.
- Exempted from travel restrictions that would preclude caring for the patient.
- Be given access to psychological, social and spiritual care, and also to respite and bereavement support as needed.

Remark: Caregivers are at risk for the same types of psychological, social and spiritual distress as patients. They are also at risk for becoming infected. Basic mental health and psychosocial support should be provided for all caregivers by asking them about their needs and concerns, and addressing them.
15. REPORTING OF DEATH DURING THE COVID-19 PANDEMIC

We recommend the use of emergency ICD codes as outlined in the International guidance for certification and coding of COVID-19 as cause of death. As there are six types of coronaviruses, we recommended not to use “coronavirus” in place of COVID-19.

Remarks:

1. The primary goal is to identify all deaths due to COVID-19. A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 disease (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death. A death due to COVID-19 may not be attributed to another disease (e.g. cancer) and should be counted independently of pre-existing conditions that are suspected of triggering a severe course of COVID-19.

2. Specification of the causal sequence leading to death in Part 1 of the certificate is important. For example, in cases when COVID-19 causes pneumonia, sepsis and acute respiratory distress; then pneumonia, sepsis and acute respiratory distress should be included, along with COVID-19, in Part 1. Certifiers should include as much detail as possible based on their knowledge of the case, from medical records, or about laboratory testing.

3. The use of official terminology, COVID-19, should be used for all certification of this cause of death. COVID-19 should be recorded on the medical certificate as cause of death for all decedents where the disease caused, or is assumed to have caused, or contributed to death. This helps to reduce uncertainty for the classification or coding and to correctly monitor these deaths.
16. DISPOSAL OF DEAD BODIES OF COVID-19

Precautions for Health Care Workers:
These are some standard precautions to be followed by health care workers while handling dead bodies of COVID as per the directions of the ministry guidelines.
1. Maintaining hand hygiene.
2. Use of personal protective equipment (e.g., water-resistant apron, gloves, masks, eyewear).
3. Safe handling of sharps.
4. Disinfect bag housing dead body; instruments and devices used on the patient.
5. Disinfect linen. Clean and disinfect environmental surfaces.

Training in infection and prevention control practices:
All staff identified to handle dead bodies in the isolation area, mortuary, ambulance and those workers in the crematorium/burial ground should be trained in the infection prevention control practices.

Body removal from isolation room or area:
1. The health worker attending to the dead body should perform hand hygiene, ensure proper use of PPE (water-resistant apron, goggles, N95 mask, gloves).
2. All tubes, drains and catheters on the dead body should be removed.
3. Any puncture holes or wounds (resulting from the removal of the catheter, drains, tubes, or otherwise) should be disinfected with 1 per cent hypochlorite and dressed with impermeable material.
4. Apply caution while handling sharps such as intravenous catheters and other sharp devices. They should be disposed into a sharps container.

Throat swab should be taken in the following cases:
- Death of a symptomatic neonate in isolation NICU born to COVID-19 positive mother
- Brought dead neonate born to a suspected/confirmed COVID-19 mother
- Neonate who is born to a suspected or confirmed COVID-19 positive mother,
- Symptomatic neonate who came to emergency ward whose mother is having symptoms of COVID-19 (send for COVID test of mother & father also)
5. Plug oral, nasal orifices of the dead body to prevent leakage of body fluids.
6. If the family of the patient wishes to view the body at the time of removal from the isolation room or area, they may be allowed to do so with the application of Standard Precautions.
7. Place the dead body in a leak-proof plastic body bag. The exterior of the body bag can be decontaminated with 1 per cent hypochlorite. The body bag can be wrapped with a mortuary sheet or sheet provided by the family members.
8. The body will be either handed over to the relatives or taken to a mortuary.
9. All used or soiled linen should be handled with standard precautions, put in a biohazard bag and the outer surface of the bag disinfected with hypochlorite solution.
10. Used equipment should be autoclaved or decontaminated with disinfectant solutions in accordance with established infection prevention control practices.
11. All medical waste must be handled and disposed of in accordance with biomedical waste management rules.
12. The health staff who handled the body will remove personal protective equipment and will perform hand hygiene.
13. Provide counselling to the family members and respect their sentiments.

**Environmental cleaning and disinfection:**
All surfaces of the isolation area (floors, bed, railings, side tables, IV stand, etc.) should be wiped with 1 per cent Sodium Hypochlorite solution; allow a contact time of 30 minutes, and then allowed to air dry.

**Dead body handling in Mortuary:**
1. Mortuary staff handling COVID dead body should observe standard precautions.
2. Dead bodies should be stored in cold chambers maintained at approximately 4°C.
3. The mortuary must be kept clean. Environmental surfaces, instruments and transport trolleys should be properly disinfected with 1 per cent Hypochlorite solution.
4. After removing the body, the chamber door, handles and floor should be cleaned with sodium hypochlorite 1 per cent solution.

**Embalming**
Embalming of the dead body should not be allowed.

**Autopsies on Covid-19 dead bodies:**
Autopsies should be avoided. If autopsy is to be performed for special reasons, the following infection prevention control practices should be adopted.
1. The Team should be well trained in infection prevention control practices.
2. The number of forensic experts and support staff in the autopsy room should be limited.
3. The Team should use the full complement of PPE (coveralls, head cover, shoe cover, N 95 mask, and goggles/face shield).
4. Round ended scissors should be used.
5. PM40 or any other heavy-duty blades with blunted points to be used to reduce prick injuries.
6. Only one body cavity at a time should be dissected.
7. Unfixed organs must be held firm on the table and sliced with a sponge care should be taken to protect the hand.
8. Negative pressure to be maintained in the mortuary. An oscillator saw with suction extraction of the bone aerosol into a removable chamber should be used for sawing skull, otherwise, a hand saw with a chain-mail glove may be used.
9. Needles should not be re-sheathed after fluid sampling needles and syringes should be placed in a sharps bucket.
10. Reduce aerosol generation during autopsy using appropriate techniques especially while handling lung tissue.
11. After the procedure, the body should be disinfected with 1 per cent Sodium Hypochlorite and placed in a body bag, the exterior of which will again be decontaminated with 1 per cent Sodium Hypochlorite solution.
12. The body thereafter can be handed over to the relatives.
13. Autopsy table to be disinfected as per standard protocol.

**Transportation:**
1. The body, secured in a body bag, the exterior of which is decontaminated poses no additional risk to the staff transporting the dead body.
2. The personnel handling the body may follow standard precautions (surgical mask, gloves).
3. The vehicle, after the transfer of the body to cremation/ burial staff, will be decontaminated with 1 per cent Sodium Hypochlorite.

**At Crematorium or Burial Ground:**
1. The Crematorium or Burial Ground staff should be sensitized that Covid-19 does not pose additional risk.
2. The staff will practice standard precautions of hand hygiene, use of masks and gloves.
3. Viewing of the dead body by unzipping the face end of the body bag (by the staff using standard precautions) may be allowed, for the relatives to see the body for one last time.
4. Religious rituals such as reading from religious scripts, sprinkling holy water and any other last rites that do not require touching of the body can be allowed.
5. Bathing, kissing, hugging, etc. of the dead body should not be allowed.
6. The funeral or burial staff and family members should perform hand hygiene after cremation or burial.
7. The ash does not pose any risk and can be collected to perform the last rites.
8. The large gathering at the crematorium or burial ground should be avoided as a social distancing measure as it is possible that close family contacts may be symptomatic and/or shedding the virus.
17. TELEMEDICINE DURING COVID-19

- Telemedicine, which is also used synonymously with ‘remote medical care’ refers to providing clinical health care through electronic communication technologies, rather than through in-person meeting between a patient and a doctor.
- How telemedicine is carried out – Through telephone/video conference
- 3 common types of telemedicine:
  - Interactive medicine – real time doctor – patient
  - Store and forward – patients particulars sharing where needed
  - Remote patient monitoring – by using mobile devices and apps
- Advantages:
  - Ease in health services operation
  - Proper appointment and show ups
  - Higher degree of quality health services
  - Cost reduction
  - Time reduction in Health services
  - Greater outreach
Telemedicine Platform function

- On-line Clinic Consulting
- Psychological Consulting
- Health Science

Community Residents

- Screening Latent Severe Patients
- Consulting

Patients

Medical Staff

- Training
- Consulting
- Quality Improvement
- Panel Discussion

Psychological Consulting

Broadcasting
COVID-19 Patient management protocol by Telemedicine

Telemedicine

Online Clinic Consulting

Stay at home

Hospital

Suspected case Distinguished in Fever Clinic

Fever of Unknown Origin?

Telemedicine Consulting by Experts

NO

Specialized Department or Stay at Home

YES

Telemedicine Consulting by Multiple Disciplinary Team

Hospitalized for Treatment

Non-Severe patients: Screening latent severe patients by Telemedicine Consulting

Severe patients: Telemedicine Consulting by Experts Group

Follow up by Telemedicine

Aarogya Setu

- ‘The bridge for liberation from disease’
- Is an Indian open source COVID-19 ‘Contact tracing, Syndromic mapping and Self-assessment’ digital service, primarily a mobile app, developed by the National Informatics Centre under the Ministry of Electronics and Information Technology
- Aarogya Setu has four sections:
  - User status – tells the risk of getting COVID-19 for the user
  - Self-Assess – helps the users identify COVID-19 symptoms and their risk profile
  - COVID-19 Updates – gives updates on local and national COVID-19 cases
  - E-pass integration – if applied for E-pass, it will be available.
APTHAMITRA

- Karnataka Chief Minister B.S. Yediyurappa launched Apthamitra, a toll-free helpline, 14410, and mobile app to answer all COVID queries
- The Apthamitra helpline, 14410, is meant exclusively for Corona-related queries, telemedicine, counseling and facilitating testing and treatment for those in need
- The aim of Apthamitra is to reach out to all Karnataka residents, especially those living in COVID hotspots and also identify patients with Influenza Like Illness (ILI), Severe Acute Respiratory Infection (SARI) and Coronavirus like symptoms.
- Operating from 8 a.m. to 8 p.m., the helpline will be run from six centres, four locations in Bengaluru and one each at Mysuru and Mangaluru.
- People who have downloaded the app can seek advice from doctors directly via telemedicine
- Apthamitra is run by the Health and Family Welfare Department and Karnataka State Disaster Management Authority (KSDMA) with support from other entities.

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
18. MENTAL HEALTH SUPPORT FOR PATIENTS & PROFESSIONALS

**Reasons for psychological disturbances**

- Fear of contracting the virus and being quarantined
- Anxiety about the wellbeing of family members, especially for the frontline workers or those living in severely affected areas and countries.
- Concern over economic slowdown and fear of losing livelihood including losing jobs, pay cuts, lockouts, financial stress and possible lifestyle changes.
- Increase in domestic violence and marital discord
- Living alone with no social support or inability to go back to their native places/not being allowed to enter their villages resulting in social stigma.
- Non-availability of liquor and other addictive drugs.
- Extreme work pressure and burnout in the case of frontline workers.

**PROBLEMS FACED BY WOMEN AT HOME**

- A recent report from WHO says that there is a 60% rise in domestic violence calls
- UN WOMEN also has reported increased violence against women and children including physical, emotional or sexual abuse
- Those quarantined go through anxiety, depression, low mood, fear, nervousness, irritability, boredom, frustration and sleep disturbances which can lead on to acute stress reaction or exacerbation of preexisting psychiatric conditions
- A significant increase in self-reported levels of depression and anxiety, and substantial reductions in physical activity in pregnant women from before to during the COVID-19 pandemic was reported.
- Depression and anxiety are well-established to have both acute (e.g., preterm delivery, attenuated fetal/neonatal growth) and long-term consequences (e.g., increased risk of future anxiety and depression, cognitive delays for the offspring) for the psychological and physical health of both mother and baby.
PROBLEMS FACED BY HEALTHCARE PROFESSIONALS

- They witness extreme suffering, deaths
- They can have disturbed sleep, nightmares, frustration but have to maintain an outward calmness and empathetic outlook, and some of them develop posttraumatic stress disorder (PTSD) later.
- Continuous and direct exposure, Extended hours of work with little or no incentives, Non-availability of expensive personal protective equipment (PPE),
- Inability to eat/ sleep properly, not visit toilets for 8 hours or more, harassment and at times assaults.
- In addition, they are unable to complain or quit as it is politically and ethically incorrect.
- Health care workers also face burn outs and are unable to visit their families. Hence their physical, psychological wellbeing is of utmost importance during this time

SIMPLE AND PRACTICAL INTERVENTIONAL STRATEGIES

1. Accept their emotional stress non judgmentally and ensure confidentiality.
2. Create an environment of acceptance and taking positive action - encourage them to ventilate their feelings and ask for help as necessary.
3. Learn to break bad news and handle grief reaction.
4. Help sort out problems by effective communication with significant others.
5. Give simple reliable information from neutral sources such as WHO, ICMR, Indian Academy of Pediatrics and reputed journals.
6. Check for overestimating the problem and avoid negative contagion - reduce the infodemic through rumours and fake news - social media distancing.
7. Maintain a routine of daily activities (adequate sleep, healthy eating, exercise, meditation, yoga, time for hobbies) and regular social contacts.

   Physical activity is an accessible measure to blunt the mental health crisis currently being experienced by pregnant and postpartum women

8. Ensure adequate family time for interactions, discussions and to prepare for life style changes as normalcy will be redefined.
9. Never hesitate to ask them to get in touch with mental health professionals, especially if they have suicidal ideation, worsening of symptoms in spite of adequate intervention and when they are aggressive, sleepless, experience severe health anxiety or indulge in self injurious behaviour.
19. VIDEO LINKS RELATED TO COVID-19

1. COVID-19 (Animated) Awareness Video for Pregnant Women and Lactating Mothers_ENGLISH
   https://www.youtube.com/watch?v=GDS7jycu4cY
2. How the coronavirus affects pregnancy and childbirth
   https://youtu.be/ITZ9T3gswzQ
3. COVID-19: Personal Protective Equipment Function and Usage
   https://youtu.be/49gKSsPCIG8
4. Pandemic COVID 19 Personal Protective Equipment PPE
   https://youtu.be/_mnyyaKuzeU
5. Personal Protective Equipment for COVID-19 Care
   https://youtu.be/84CydmuHXD8
6. Transfer to OR for Urgent Caesarean (Covid-19 era)
   https://youtu.be/llkKTnQbCNw
7. Neonatal Resuscitation adjacent to the OR Covid 19 Precautions
   https://www.youtube.com/watch?v=QS8pLIrplvEU
8. Neonatal Resuscitation in the OR Covid 19 Precautions
   https://www.youtube.com/watch?v=6hzOqUXvEFs
9. NICU COVID 19 Intubation Demonstration
   https://www.youtube.com/watch?v=Jf_XuxZ-L6o\0
10. Collection of Oropharyngeal throat, Nasal Middle Turbinate or Nasopharyngeal Swabs
    https://youtu.be/Jmhp9C15iK0
11. COVID-19 Diagnostics: Performing a Nasopharyngeal and Oropharyngeal Swab
    https://youtu.be/syXd7kgLSN8
    https://youtu.be/TdIsTLg7RQM
13. Covid-19 Rx: Treatment Simulations:
15. Black Light Simulation Shows How Quickly COVID-19 Spreads in Restaurants
   [https://youtu.be/nj18ZWnprBs]

16. Simulation shows deadly COVID-19 cough droplets can spread more than three and half metres
   [https://youtu.be/cDE5J7og_xM]

17. Recognizing Day to Day Signs and Symptoms of Coronavirus
   [https://youtu.be/U8r3oTVMtQ0]

18. COVID Chronicles- Continulus, BACCN and COVID Simulation video

19. Office Sneeze | Examining the Spread of COVID 19 from Person-To-Person in Air-Conditioned Spaces
   [https://youtu.be/UEM5gE-AcXM]

20. Mentice - Medical Simulation during COVID-19
    [https://youtu.be/ugsAF9UjRMc]

21. 3D model shows how an indoor cough can spread a 'cloud' of coronavirus

22. HOW DOES COVID-19 AFFECT THE BODY?
    [https://youtu.be/Xj1nUFFVK1E]

23. Coronavirus (Covid19) Simulation of sneeze using Cradle scFLOW.
    [https://youtu.be/ICc_H75R05A]

24. Aerosols: Key to control the coronavirus spread?
    [https://youtu.be/jMLGyL5neik]

25. COVID-19: Yale Physicians Discuss the Coronavirus
    [https://youtu.be/dh9kyIMiKqU]

26. How does Coronavirus affect our lungs?
    [https://youtu.be/4HPlSm94czk]

27. This 3-D model shows what coronavirus looks like inside your lungs
    [https://youtu.be/NfKocnRkKek]

28. Staying Safe When COVID-19 Strikes
    [https://youtu.be/UcFDdfueQRg]
29. COVID 19 Code Blue
   https://youtu.be/n_JGBpdc_U
30. Covid-19 Social Distancing Simulation Tutorial - Greenfoot
   https://youtu.be/32YhPVo6LIs
31. Cytokine Storm in COVID-19
   https://youtu.be/rpmUG6pb0zs
32. 3D Animation: SARS-CoV-2 virus transmission leading to COVID-19
   https://youtu.be/PSnSo9kYlH4
33. 360° VR VIDEO - CORONAVIRUS - How To Protect Yourself!
    SENSIBILISATION - VIRTUAL REALITY 3D
   https://youtu.be/jqUwVXo4B3s
34. Telehealth before and after COVID-19
   https://youtu.be/_T-fUjYDfqc
35. COVID-19: Lessons Learned: Telemedicine in Primary Care
   https://youtu.be/Kg9jSLtvXcU
36. Strengthening Your Telehealth Program to Respond to COVID-19 Demand
   https://youtu.be/mx_b_DmtjQ8
37. Coronavirus outbreak (covid 19) explained through 3D Medical Animation
   https://youtu.be/I-Yd-_XIWJg
20. COVID-19 VACCINES AND DRUGS

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<td>13</td>
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- **Preclinical Testing**: Scientists give the vaccine to animals such as mice or monkeys to see if it produces an immune response.
- **Phase I Safety Trials**: Scientists give the vaccine to a small number of people to test safety and dosage as well as to confirm that it stimulates the immune system.
- **Phase II Expanded Trials**: Scientists give the vaccine to hundreds of people split into groups, such as children and the elderly, to see if the vaccine acts differently in them. These trials further test the vaccine’s safety and ability to stimulate the immune system.
- **Phase III Efficacy Trials**: Scientists give the vaccine to thousands of people and wait to see how many become infected, compared with volunteers who received a placebo. These trials can determine if the vaccine protects against the coronavirus.
- **Approval**: Regulators in each country review the trial results and decide whether to approve the vaccine or not. During a pandemic, a vaccine may receive emergency use authorization before getting formal approval.
- **Warp Speed**: The U.S. government’s Operation Warp Speed program is expected to name five or more vaccine projects to receive billions of dollars in federal funding before there’s proof that the vaccines work.
**Types of vaccines**

**Genetic vaccines**: Vaccines that use one or more of the coronavirus’s own genes to provoke an immune response.

**Viral vector vaccines**: Vaccines that use a virus to deliver coronavirus genes into cells and provoke an immune response.

**Protein based vaccines**: Vaccines that use a coronavirus protein or a protein fragment to provoke an immune response.

**Whole Virus vaccines**: Vaccines that use a weakened or inactivated version of the coronavirus to provoke an immune response.
## 23 candidate vaccines in clinical evaluation (as per WHO)

<table>
<thead>
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<th>Platform</th>
<th>Type of candidate vaccine</th>
<th>Developer</th>
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<th>Current stage of clinical evaluation/regulatory status- Coronavirus candidate</th>
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<td>Inactivated</td>
<td>Inactivated + alum</td>
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<td>SARS-CoV2</td>
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<td>University of Oxford/AstraZeneca</td>
<td>SARS-CoV2</td>
<td>Phase 3 ISRCTN89951424 Phase2b/3 2020-001228-32 Phase 1/2 PACTR202006922165132 2020-001072-15</td>
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<td>Bharat Biotech</td>
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<td>Phase 1/2 CTRI/2020/07/026300</td>
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140 candidate vaccines in preclinical evaluation (as per WHO)

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Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
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<td>S1 or RBD protein</td>
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<td>Subunit protein, plant produced</td>
<td>iBio/CC-Pharming</td>
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<tr>
<td>Recombinant protein, nanoparticles (based on S-protein and other epitopes)</td>
<td>Saint-Petersburg scientific research institute of vaccines and serums</td>
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<td>Pre-Clinical</td>
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<td>COVID-19 XWG-03 truncated S (spike) proteins</td>
<td>Innovax/Xiamen Univ./GSK</td>
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<td>Adjuvanted microsphere peptide</td>
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<td>Synthetic Long Peptide Vaccine candidate for S and M proteins</td>
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<td>Oral E. coli-based protein expression system of S and N proteins</td>
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<td>Nanoparticle vaccine</td>
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<td>Plant-based subunit (RBD-Fc + Adjuvant)</td>
<td>Baiya Phytopharm/Chula Vaccine Research Center</td>
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<td>OMV-based vaccine</td>
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<td>Flu A, plague</td>
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<td>OMV-based vaccine</td>
<td>BioMVIS Srl/Univ. of Trento</td>
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<td>Pre-Clinical</td>
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<td>structurally modified spherical particles of the tobacco mosaic virus (TMV)</td>
<td>Lomonosov Moscow State University</td>
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<td>rubella, rotavirus</td>
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<td>Spike-based</td>
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<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
<td>Hepatitis C</td>
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<tr>
<td>Recombinant S1-Fc fusion protein</td>
<td>AnyGo Technology</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>Protein Subunit</td>
<td>Recombinant protein</td>
<td>Yisheng Biopharma</td>
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<td>Protein Subunit</td>
<td>Recombinant S protein in IC-BEVS</td>
<td>Vabiotech</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<td>Protein Subunit</td>
<td>Orally delivered, heat stable subunit</td>
<td>Applied Biotechnology Institute, Inc.</td>
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<td>Pre-Clinical</td>
</tr>
<tr>
<td>Protein Subunit</td>
<td>S-2P protein + CpG 1018</td>
<td>Medigen Vaccine Biologics Corporation/NIAID/DynaVax</td>
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<td>Pre-Clinical</td>
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<tr>
<th>Protein Subunit</th>
<th>Protein Subunit</th>
<th>MOGAM Institute for Biomedical Research, GC Pharma</th>
<th>SARS-CoV2</th>
<th>Pre-Clinical</th>
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<tr>
<td>Protein Subunit</td>
<td>RBD-based</td>
<td>Neovii/Tel Aviv University</td>
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<td>Pre-Clinical</td>
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<tr>
<td>Protein Subunit</td>
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<td>Kentucky Bioprocessing, Inc.</td>
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<tr>
<td>Protein Subunit</td>
<td>Outer Membrane Vesicle (OMV)-subunit</td>
<td>Intravacc/Epivax</td>
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<td>Pre-Clinical</td>
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<tr>
<td>Protein Subunit</td>
<td>Outer Membrane Vesicle (OMV)-peptide</td>
<td>Intravacc/Epivax</td>
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<td>Pre-Clinical</td>
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<tr>
<td>Protein Subunit</td>
<td>Spike-based (epitope screening)</td>
<td>ImmunoPrecise/LiteVax BV</td>
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<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>YF17D Vector</td>
<td>KU Leuven</td>
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<td>Replicating Viral Vector</td>
<td>Measles Vector</td>
<td>Cadila Healthcare Limited</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>Measles Vector</td>
<td>Institute Pasteur/Themis/Univ. of Pittsburgh Center for Vaccine Research/Merck</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>Measles Virus (S, N targets)</td>
<td>FBRI SRC VB VECTORS, Rospotrebnadzor, Koltsovo</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>Horsepox vector expressing S protein</td>
<td>Tonix Pharma/Southern Research</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>Live viral vectored vaccine based on attenuated influenza virus backbone (intranasal)</td>
<td>BiOCAD and IEM</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
</tr>
<tr>
<td>Replicating Viral Vector</td>
<td>Recombinant vaccine based on Influenza A virus, for the prevention of COVID-19 (intranasal)</td>
<td>FBRI SRC VB VECTORS, Rospotrebnadzor, Koltsovo</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
</tr>
<tr>
<td>Replicating Viral Vector</td>
<td>Attenuated Influenza expressing an antigenic portion of the Spike protein</td>
<td>Fundação Oswaldo Cruz and Instituto Buntantan</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>Influenza vector expressing RBD</td>
<td>University of Hong Kong</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
<table>
<thead>
<tr>
<th>Replicating Viral Vector</th>
<th>Replication-competent VSV chimeric virus technology (VSVΔG) delivering the SARS-CoV-2 Spike (S) glycoprotein.</th>
<th>JAVI/Merck</th>
<th>SARS-CoV2</th>
<th>Pre-Clinical</th>
<th>Ebola, Marburg, Lassa</th>
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<tbody>
<tr>
<td>Replicating Viral Vector</td>
<td>VSV-S</td>
<td>University of Western Ontario</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
<td>HIV, MERS</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>VSV-S</td>
<td>Aurobindo</td>
<td>SARS-CoV2</td>
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<td>Replicating Viral Vector</td>
<td>VSV vector</td>
<td>FBRI SRC VB VECTOR, Rospotrebnadzor, Koltsovo</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>VSV-S</td>
<td>Israel Institute for Biological Research/Weizmann Institute of Science</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>M2-deficient single replication (M2SR) influenza vector</td>
<td>UW-Madison/FluGen/Bhar at Biotech</td>
<td>SARS-CoV2</td>
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<td>influenza</td>
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<td>Replicating Viral Vector</td>
<td>Newcastle disease virus vector (NDV-SARS-CoV-2/Spike)</td>
<td>Intravacc/ Wageningen Bovinoveterinary Research/Utrecht Univ.</td>
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<td>Pre-Clinical</td>
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<tr>
<td>Replicating Viral Vector</td>
<td>Avian paramyxovirus vector (APMV)</td>
<td>The Lancaster University, UK</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<p>| RNA | Self-amplifying RNA | Gennova | SARS-CoV2 | Pre-Clinical |
| RNA | mRNA | Selcuk University | SARS-CoV2 | Pre-Clinical |
| RNA | LNP-mRNA | Translate Bio/Sanofi Pasteur | SARS-CoV2 | Pre-Clinical |
| RNA | LNP-mRNA | CanSino Biologics/Precision NanoSystems | SARS-CoV2 | Pre-Clinical |
| RNA | LNP-encapsulated mRNA cocktail encoding VLP | Fudan University/ Shanghai JiaoTong University/RNACure Biopharma | SARS-CoV2 | Pre-Clinical |
| RNA | LNP-encapsulated mRNA encoding RBD | Fudan University/ Shanghai JiaoTong University/RNACure Biopharma | SARS-CoV2 | Pre-Clinical |
| RNA | Replicating Defective SARS-CoV-2 derived RNAs | Centro Nacional de Biotecnología (CNB-CSIC), Spain | SARS-CoV2 | Pre-Clinical |
| RNA | LNP-encapsulated mRNA | University of Tokyo/ Daiichi-Sankyo | SARS-CoV2 | Pre-Clinical | MERS |
| RNA | Liposome-encapsulated mRNA | BIOCAD | SARS-CoV2 | Pre-Clinical |
| RNA | Several mRNA candidates | RNAimmune, Inc. | SARS-CoV2 | Pre-Clinical |
| RNA | mRNA | FBRI SRC VB VECTOR, Rospotrebnadzor, Koltsovo | SARS-CoV2 | Pre-Clinical |
| RNA | mRNA | China CDC/Tongji University/Stermina | SARS-CoV2 | Pre-Clinical |
| RNA | mRNA | Arcturus/Duke-NUS | SARS-CoV2 | Pre-Clinical | multiple candidates |
| RNA | LNP-mRNA | Chula Vaccine Research Center/University of Pennsylvania | SARS-CoV2 | Pre-Clinical |
| RNA | mRNA in an intranasal delivery system | eTheRNA | SARS-CoV2 | Pre-Clinical |
| RNA | mRNA | Greenlight Biosciences | SARS-CoV2 | Pre-Clinical |</p>
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<th>RNA</th>
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<td>Middle East Technical University</td>
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<td>VLP</td>
<td>Enveloped Virus-Like Particle (eVLP)</td>
<td>VBI Vaccines Inc.</td>
<td>SARS-CoV-2, SARS-CoV1, &amp; MERS-CoV</td>
<td>Pre-Clinical</td>
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<td>S protein integrated in HIV VLPs</td>
<td>IrsiCaixa AIDS Research/IRTA-CReSA/Barcelona Supercomputing Centre/Grifols</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
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<tr>
<td>VLP</td>
<td>VLP + Adjuvant</td>
<td>Mahidol University/ The Government Pharmaceutical Organization (GPO)/Siriraj Hospital</td>
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<td>Pre-Clinical</td>
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<tr>
<td>VLP</td>
<td>Virus-like particles, lentivirus and baculovirus vehicles</td>
<td>Navarrabiomed, Oncoimmunology group</td>
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<td>Pre-Clinical</td>
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<td>VLP</td>
<td>Virus-like particle, based on RBD displayed on virus-like particles</td>
<td>Saiba GmbH</td>
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<tr>
<td>VLP</td>
<td>ADDomerTM multiepitope display</td>
<td>Imophoron Ltd and Bristol University’s Max Planck Centre</td>
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<td>Doherty Institute</td>
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<tr>
<td>VLP</td>
<td>VLP + Adjuvant</td>
<td>OSIVAX</td>
<td>SARS-CoV1</td>
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<tr>
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<td>eVLP</td>
<td>ARTES Biotechnology</td>
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<td>VLP peptides/whole virus</td>
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<td>Unknown</td>
<td>Unknown</td>
<td>Tulane University</td>
<td>SARS-CoV2</td>
<td>Pre-Clinical</td>
</tr>
</tbody>
</table>

**COVAXIN**
- First Indigenous COVID-19 vaccine candidate
- NIV isolated strain from an asymptomatic COVID-19 patient
- Transferred to Bharat Biotech International Limited (BBIL) in May
- Inactivated vaccine: Killed Virus
Antivirals, Immuno-modulators and other adjunctive therapies for COVID-19

It is recommended that the following drugs can be administered as treatment or prophylaxis for COVID-19 in non-pregnant adults:

1. Chloroquine and hydroxychloroquine (+/- Azithromycin), including but not limited to:
2. Antivirals, including but not limited to:
   - Lopinavir / Ritonavir
   - Remdesivir
   - Umifenovir
   - Favipiravir
3. Immunomodulators, including but not limited to:
   - Tocilizumab
   - Interferon-beta-1a
4. Plasma therapy
### HYDROXYCHLOROQUINE

**Dose:** 6.5mg/kg/dose BD PO on day 1  
3.25mg/kg BD PO for 4 days  
**Adverse effects:** Retinopathy, Rash, Nausea, glucose fluctuations and diarrhoea  
**Contraindications:** QT prolongation >500ms, porphyria, retinal pathology, myasthenia gravis.

### LOPINAVIR / RITONAVIR

**Action:** Antiretroviral agent; Protease inhibitor  
**Inhibits proteolysis**  
**Dose:** 14 days to 6 months-16mg/kg/dose PO BD  
<15kg – 12mg/kg/dose PO BD  
15-25kg – 200mg/50mg PO BD  
26-35kg- 300mg/75mg PO BD  
>35kg- 400mg/100mg PO BD  
**Duration:** 14 days or 7 days after becoming asymptomatic.  
**Adverse events:** Hepatotoxicity, pancreatitis, QT prolongation

### REMDESIVIR

**Action:** Anti-viral drug, Inhibits viral RNA- dependent RNA polymerase.  
**Formulation:** available as a lyophilized powder for Injection only  
**Dose:** 3.5kg to <40kg- Day 1- 5mg/kg single dose  
Day 2 – 2.5 mg/kg single dose  
**Storage and handling of prepared dosages:** – contains no preservative, single dose vial should be discarded after a diluted solution is prepared.  
**Side effects:** hypersensitivity including transfusion related and anaphylactic reactions  
Increased risk of transaminase elevations  
**Contraindications:** severe renal impairment, pregnancy or lactating females, children <12 years of age.
CONVALESCENT PLASMA THERAPY
Composition: mixture of inorganic salts, organic compounds, water and more than 1000 proteins, albumin, immunoglobulins, complement, coagulation and anti-thrombotic factors.
Actions: direct neutralization of the virus, control of an overactive immune system and immunomodulation of a hypercoaguable state.
Dose: 3ml/kg/dose in two days
Subjects: Convalescent donors between 18-65 years. Negative test for COVID after 14 days of recovery.
Procedure: - Apheresis is done to obtain plasma. Continuous centrifugation of blood from donor to allow selective collection of plasma.
- Around 400-800ml is obtained from single apheresis donation. Should be frozen within 24 hours of collection.
- Convalescent plasma should be free of any infection. Tests of HIV, Hep. B, Hep. C, Syphilis, human T cell lymphoma virus 1 and 2 and Trypanosoma cruzi should be ruled out

CORTICOSTEROIDS
- Role of steroids is unclear
- Studies are based on similar SARS-Co-V and MERS-C0-V
- Use: Refractory shock, or in patients who fail to improve with conventional management of severe ARDS.
- Inhaled > systemic
- Dose: 0.5-1mg/kg/day for <7 days

ROLE OF IVIG IN SEVERE COVID -19
- IVIG confers passive immunity and has been proven efficiency as an immunomodulatory treatment
- Exact mechanism for improved immune function after IVIG is not fully understood.
- Dose: 0.3-0.5 g/kg/ day for five days.
21. GOVERNMENT OF INDIA & KARNATAKA

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO

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21.1 Circulars & Notifications (GoK)

21.1.1 Guidelines for Home-isolation

GOVERNMENT OF KARNATAKA

No: HFW 242 ACS 2020

Karnataka Government Secretariat,
Vikasa Soudha,
Bengaluru, Date: 4th July 2020.

CIRCULAR

Guidelines for isolation of COVID positive person at home

The guideline for home isolation of COVID-19 cases has been issued by Ministry of Health and Family Welfare-Government of India. In view of evolving situation of COVID-19 in the state, the following guidelines are issued:

The persons who have tested COVID positive shall be permitted to be in “home isolation” with the following conditions:

1. Only those who are asymptomatic or mild symptomatic shall be allowed to be in isolation at home
2. They shall be oriented to the protocol of home isolation
3. Health team from district health authority/ BBMP/ authorised private institution/agency shall visit the house and assess the suitability of house for home isolation and also do triage of the person.
4. Dedicated tele-monitoring link shall be established for daily follow-up of the person during the entire period of home isolation
5. The person shall report to the physician/ health authorities about their health status every day
6. The person shall have pulse oximeter, digital thermometer and personal protective equipment (facemasks, gloves) to be used during home isolation.
7. The release of the person from home isolation shall be as per the existing discharge protocol of the state for COVID-19 (vide below sl. no.10)
8. The home isolation shall be with the knowledge of the family members, neighbours, treating physician and local health authorities.

The detailed guidelines for home isolation are as follows:

1. Initial assessment and triage of person by health team at person’s house
   - After receipt of Covid positive report, the person shall isolate himself/herself at home in a separate room. Health team shall visit and assess the suitability of the house for isolation of the person at home and also do triage of the person
   - Ask regarding following symptoms: Fever, cold, cough, throat pain, difficulty in breathing, etc.
   - The health staff shall assess the following parameters (Triage)
     - Thermal scanning for fever
     - Pulse oximetry for SpO₂ and pulse rate
     - Glucometer for random blood sugar
     - Blood pressure recording using BP apparatus
• Enquire for co-morbidities like hypertension, diabetes, obesity, thyroid disease, cancer, kidney disease including persons on dialysis, heart disease, stroke, Tuberculosis, People living with HIV, immune-compromised, on steroids and immune-suppressants, etc.
• Link the person to tele-monitoring centre for daily follow-up
• For further daily follow-up of the person, tele-monitoring through government or private institution/agency shall be arranged as desired by the person.

2. Eligibility for Home Isolation
• The person shall be clinically assigned as asymptomatic/mild case by the treating medical officer/physician
• Such cases should have the requisite facility at their residence for self-isolation and also for quarantining the family contacts
• A caregiver should be available to provide care on a 24 x 7 basis. A regular communication link between the caregiver and hospital is a pre-requisite for the entire duration of home isolation
• Mild fever < 38°C (< 100.4°F)
• Oxygen saturation should be ≥ 95%
• Age shall be less than 60 years
• If the person has the following co-morbidities- Hypertension, diabetes mellitus, obesity, thyroid disease; they are well managed and under good clinical control as assessed by medical officer/physician
• Shall not have any comorbid conditions like kidney diseases including persons on dialysis, heart diseases, stroke, Tuberculosis, cancer, people living with HIV, immune-compromised, on steroids and immune-suppressants, etc.
• The person shall provide a signed undertaking on self-isolation (Annexure-1) and follow guidelines of home isolation
• The person shall agree to monitor his/her health (Annexure-2) and regularly inform their health status to the physician and District Surveillance Officer (DSO) for further follow up by the surveillance teams.
• Home isolation shall not be applicable for pregnant women 4 weeks before expected date of delivery (EDD)

3. Requisite facility at home for isolation
• Separate well ventilated room with a separate toilet for the person in isolation
• The person shall stay in the identified room and away from other persons in the home especially the elderly and those with comorbid conditions like hypertension, cardiovascular disease, renal disease, etc.)

If the person does not fit to the above criteria for home isolation or the house is not suitable for home isolation, then isolation at a facility (CCC/DCHC/DCH) is recommended
The following criteria shall be used for shifting the person to CCC, DCHC or DCH as applicable:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>COVID care Centre* (CCC)</th>
<th>Dedicated COVID Health Centre(DCHC) (Beds with Oxygen facility)</th>
<th>Dedicated COVID Hospital (DCH) (ICU Beds Available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical condition</td>
<td>Asymptomatic or Mild</td>
<td>Moderate</td>
<td>Severe</td>
</tr>
<tr>
<td>Measure Oxygen Saturation</td>
<td>SpO₂ more than 94%</td>
<td>SpO₂ between 90 to 94%</td>
<td>SpO₂ less than 90%</td>
</tr>
<tr>
<td>Pulse Rate</td>
<td>&lt;100/ min</td>
<td>100-120/min</td>
<td>&gt;120/ min</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td>-</td>
<td>-</td>
<td>&lt;100 mm Hg</td>
</tr>
<tr>
<td>Respiratory Rate</td>
<td>&lt; 24/ min</td>
<td>24-30/min</td>
<td>&gt;30/min</td>
</tr>
</tbody>
</table>

Co-morbid Conditions
- Hypertension, diabetes mellitus, obesity, thyroid disease under good clinical control as assessed by medical officer/physician
- Without any other co-morbid conditions
- With co-morbid conditions
- Pregnant women - 4 weeks before expected date of delivery (EDD)
- with comorbid conditions

Note: * when the house is found not suitable for isolating the person at home; besides, shifting of the person may also be considered if the asymptomatic person opts for CCC

Algorithm for deciding Home isolation

1. A person tests positive for COVID-19
2. Health team/medical officer/physician decides whether the infected individual is eligible for isolation at home
3. Eligible for home isolation (Asymptomatic/mild symptoms)
   - Assess Suitability of house for isolation (separate well ventilated room preferably with attached toilet)
   - Suitable
     - Isolate the person at home
   - Not Suitable
     - Shift the person to Covid Care Centre (CCC)
4. Not Eligible for home isolation (Moderate/Severe cases)
   - DCHC/DCH
4. When to seek further medical advice

Further medical advice shall be immediately sought if the following symptoms and signs develop:
- Difficulty in breathing
- Oxygen saturation ≤ 94% using fingertip pulse oximeter
- Persistent fever of ≥38°C (100.4°F) for more than 24 hours
- Persistent pain/pressure in the chest
- Mental confusion or inability to arouse
- Slurred speech/seizures
- Weakness or numbness in any limb or face
- Developing bluish discolorations of lips/face
- Any other symptom the person considers serious
- As advised by treating physician

5. Instructions to health staff monitoring the person in home isolation

- Ensure strict enforcement of isolation of person at home
  - Home isolation notice shall be pasted on the front door of the house
  - Hand stamping shall be done for the person in home isolation for a duration of 17 days
  - Quarantine watch app shall be downloaded and used for daily monitoring
  - Inform at least two neighbours regarding isolation of person at home
  - Three member team in the ward/ village/ booth level/ resident welfare or apartment owners’ association shall oversee compliance of the person to isolation at home
  - If the person is found violating the protocol of home isolation, action will be taken under the Disaster management Act read with IPC and he/she shall be shifted to CCC.
  - Link the person to tele-monitoring centre for daily follow-up
  - IVRS outbound calls through Aaphamitra helpline (14410) shall be made to the person on a daily basis
- The caregiver and all close contacts of such cases shall take Hydroxychloroquine prophylaxis as per protocol and as prescribed by the treating medical officer/physician
- Telephonically or using tele-monitoring mode, check the person for development of new symptoms or fever or deterioration in oxygen saturation(≤94%) at least once daily
- Gloves, masks, and other waste generated during home isolation are placed in a closed bin in the person’s room before disposing of it as infectious waste. The disposal of infectious waste shall be the responsibility of the local municipal authority.
- Inform the neighbours to be kind to the person in isolation and his/her family and not to stigmatise the person in isolation/family
- Concerned area medical officer (PHC/UPHC/CHC/GH) shall report details about patients under home isolation to DSO on daily basis. The same shall be updated on GOI-COVID-19 portal and facility app by DSO every day
6. Instructions to the person in home isolation

- The person shall wear medical facemask/ N-95 facemask at all times. The mask shall be discarded after 8 hours of use or earlier if it becomes wet or visibly soiled.
- Mask shall be discarded only after disinfecting it with 1% sodium hypo-chlorite solution
- The person must stay in the identified room only and maintain a physical distance of 2 meters/ 6 feet from other people in the home, especially elderly and those with comorbid conditions like hypertension, cardiovascular disease, renal disease, etc.
- The person shall take rest and drink a lot of fluids to maintain adequate hydration. Drink atleast 2 litres of water per day. Use boiled and cooled water for drinking.
- Shall follow cough etiquettes at all times
- Hands shall be washed often with soap and water for at least 40 seconds or cleaned with an alcohol-based sanitizer.
- Do not share personal items like utensils, towels, etc. with other family members. Keep them separate.
- Clean surfaces in the room that are touched often (table-tops, doorknobs, handles, etc.) with 7% Lysol or 1% sodium hypochlorite solution
- Clean and disinfect bathroom and toilet surfaces at least once daily. Regular household soap or detergent should be used first for cleaning, followed by 1% sodium hypochlorite solution.
- The person shall strictly follow the physician’s instructions and medication advice (Annexure-3)
- The person shall self-monitor his/her health with a fingertip pulse oximeter and digital thermometer daily
- The person shall report promptly if he/she develops any worsening of symptoms, as mentioned above (SI no. 4)
- The person shall take healthy and nutritious diet. A Model diet plan is given vide annexure-4
- Smoking, chewing tobacco and alcohol intake shall be strictly avoided
- The person shall receive counselling services when necessary
- Download Arogya Setu App on mobile (available at https://www.mygov.in/aarogya-setuapp/) and it should remain active at all times (through Bluetooth and Wi-Fi)

7. Instructions to caregivers

- The caregiver shall wear medical facemask/ N-95 facemask appropriately when in the same room with the ill person. The front portion of the mask should not be touched or handled during use.
- If the mask gets wet or dirty with secretions, it shall be changed immediately. Discard the mask after use and perform hand hygiene after disposal of the mask into separate closed bin.
- He/she shall avoid touching eyes, nose or mouth.
- Hand hygiene shall be ensured following contact with the person.
• Hand hygiene shall be practised before and after preparing food, before eating, after using the toilet, and whenever hands look dirty. Use soap and water for hand washing at least for 40 seconds. Alcohol-based hand rub can be used if hands are not visibly soiled.
• After using soap and water, use of disposable paper towels to dry hands is desirable.
• Exposure to a person: Avoid direct contact with body fluids of the person, particularly oral or respiratory secretions. Use disposable gloves while handling the person. Perform hand hygiene before and after removing gloves.
• Avoid exposure to potentially contaminated items (e.g. avoid sharing food, utensils, dishes, drinks, used towels or bed linen).
• Food must be provided to the person in his/her room.
• Utensils and dishes used by the person shall be cleaned with soap/detergent and water wearing gloves. The utensils and dishes may be re-used—clean hands after taking off gloves or handling used items.
• Person’s clothes, bed linen, and bath and hand towels shall be washed separately using regular laundry soap and warm water or machine wash at 60–90 °C (140–194 °F) with common household detergent, and sundried thoroughly.
• Gloves and protective clothing (e.g. plastic aprons) shall be used when cleaning surfaces or handling clothing or linen soiled with body fluids. Single-use gloves shall be used and discarded after each use. Perform hand hygiene before putting on and after removing gloves.
• The caregiver shall make sure that the person follows the prescribed treatment.
• The caregiver shall ensure counselling services to the person, whenever necessary.
• The caregiver and all close contacts will self-monitor their health with daily temperature monitoring and report promptly if they develop any symptom suggestive of COVID-19 (fever, cough, cold, sore throat, difficulty in breathing, etc.)

8. Instructions to the family members of person in home isolation
• Do not panic. Do not stigmatise.
• Keep the person cheerful and boost their morale
• Ensure that the person is in strict home isolation
• Maintain a physical distance of at least 2 metres/6 feet
• Visitors are strictly not allowed until the person has completely recovered and has no signs or symptoms of COVID-19
• Remember, the fight is against the disease and not the person
• For any assistance, please call Apathamitra helpline – 14410

9. Instructions to neighbours of persons who are home isolated
• Do not panic. Do not stigmatise.
• Support the person and his/her family by providing essential items like medicines, rations, vegetables, etc. until they get cured as may be required
• Keep a vigil on the person in home isolation to ensure strict home isolation.
• Maintain a physical distance of 2 metres/6 feet.
• Remember, the fight is against the disease and not the person
• For any assistance, please call Apathamitra helpline – 14410
10. When to release the person from isolation at home

- Person under home isolation shall end home isolation 17 days after onset of symptoms (or date of sampling, for asymptomatic cases) and no fever for 3 days.

- They shall be released if the following criteria are met:
  - No symptoms
  - No fever (recorded temperature ≤ 37.5°C or ≤ 99.5°F)
  - Maintains saturation above 95%
  - Respiratory rate less than 24 per minute

- There is no need for the RT-PCR/CBNAAT/True-NAT test after the home isolation period is over.

- The person shall be allowed to resume duty only after satisfactory completion of home isolation.

- A fitness certificate shall be issued by the concerned area medical officer (PHC/UPHC/CHC/GH)/treating physician. (Annexure-5)

- If the person in home isolation is under consultation/daily monitoring by private hospital, the concerned private hospital shall report to district surveillance officer (DSO) regarding release of person from home isolation.

- Disinfection of the house: After completion of home isolation, disinfect all the commonly touched surfaces and objects inside the house with 7% Lysol or 1% sodium hypochlorite solution. Spraying the 1% sodium hypochlorite solution on the floors, walls above 6 feet, ceiling and open places shall not provide any benefit. The floors shall be wet mopped with common household detergent.

To,

1. All Deputy Commissioners.
2. All CEOs of Zilla Panchayats.
3. All District Health Officers.

Copy for information:
1. Chief Secretary, Government of Karnataka
2. Commissioner, BBMP, Bengaluru.
3. Additional Chief Secretary to Govt., Health & Family Welfare Dept.
4. Principal Secretary to Govt., Horticulture Dept. & Special Officer, COVID Care Centre
5. Principal Secretary to Govt., Cooperation Dept. & Special Officer – Management, Designated COVID Health Centre
6. Commissioner, Health & Family Welfare Services
7. Mission Director, National Health Mission

(Signed) A. Akhtar
Additional Chief Secretary to Government
Health & Family Welfare Department

Page 7 of 12
Annexure 1: Undertaking on home-isolation

I ........................................ S/W of ................................... resident of .................................................. being diagnosed as a laboratory confirmed/positive of COVID-19, do hereby voluntarily undertake to maintain strict home-isolation at all times for the prescribed period. During this period, I shall monitor my health and of those around me. I shall co-operate with the physician and the surveillance team and with the call centre (14410). In case I suffer from any deteriorating symptoms or develop new symptoms or any of my close family members develop any symptoms consistent with COVID-19, shall immediately inform the physician and surveillance team.

I have been explained in detail about the precautions that I need to follow while I am under home-isolation.

I hereby declare that I have the following comorbid conditions (encircle):
1. Hypertension
2. Diabetes Mellitus
3. Thyroid disorder
4. Obesity
5. Others (specify)..........................

I hereby declare that I do not have the following comorbid conditions: kidney diseases, heart disease, stroke, Tuberculosis, cancer, HIV, immune-compromised conditions, etc.

I am liable to be acted on under the prescribed law for any non-adherence/violation to home-isolation protocol.

Signature of the person in home isolation: ........................................
Name: ..........................................................................................
Age/sex: .....................................................................................
Date: ..........................................................................................
Contact Number: ..........................................................................

Signature of the witness (household member): .........................
Name: ..........................................................................................
Age/sex: .....................................................................................
Relationship to the person: ..........................................................
Date: ..........................................................................................
Contact Number: ..........................................................................

Countersignature by Treating Medical Officer/Physician:
Name: 
Date: 

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
## Annexure 2: Daily Self-Monitoring and Reporting

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Pulse rate</th>
<th>Body temperature</th>
<th>Oxygen Saturation (Fingertip Pulse oximetry)</th>
<th>Remarks (if any)</th>
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<tr>
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<td>Morning 7 am</td>
<td>Afternoon 2 pm</td>
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<td>Afternoon 2 pm</td>
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</tbody>
</table>
Annexure 3: Management Plan for Home isolation of COVID-19 persons

<table>
<thead>
<tr>
<th>Recommended Investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Blood Count</td>
</tr>
<tr>
<td>Random Blood Sugar</td>
</tr>
<tr>
<td>HbA1C (if known diabetic)</td>
</tr>
<tr>
<td>Electrocardiogram (ECG)</td>
</tr>
</tbody>
</table>

Note: Any other investigations as deemed necessary by the attending medical officer/physician

<table>
<thead>
<tr>
<th>Recommended Treatment Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
</tr>
<tr>
<td>1. Tab Hydroxychloroquine Sulphate (HCQS) – 400 mg BD for 1 Day followed by 200 mg 1-0-1 for 4 Days</td>
</tr>
<tr>
<td>Contraindications for HCQS:</td>
</tr>
<tr>
<td>1) QT interval &gt; 500ms</td>
</tr>
<tr>
<td>2) Porphyria</td>
</tr>
<tr>
<td>3) Myasthenia Gravis</td>
</tr>
<tr>
<td>4) Retinal Pathology</td>
</tr>
<tr>
<td>5) Epilepsy</td>
</tr>
<tr>
<td>2. Tab Zinc 50 mg 0-1-0 for 7 Days</td>
</tr>
<tr>
<td>3. Tab Vitamin C 500 mg 1-1-1 for 7 days</td>
</tr>
<tr>
<td>Vitals should be re-assessed regularly</td>
</tr>
<tr>
<td>HCQS is not contraindicated in pregnancy</td>
</tr>
</tbody>
</table>

- Additional Medications
  - a. All persons to continue the regular medications for the pre-existing comorbid illnesses like Hypertension, Diabetes Mellitus, Hypothyroidism, etc.
  - b. Tab Pantoprazole 40 mg 1-0-0 (empty stomach), if required
  - c. Antitussive cough syrups – For dry cough
  - d. Tab Cetrizine 10 mg 0-0-1 – For running nose if required
  - e. Tab Paracetamol 500 mg/ 650 mg SOS – For Fever

- Tab Hydroxychloroquine Sulphate (HCQS) Prophylaxis for the Household Contacts/Caregiver of COVID19 Positive Person:
  - o Tab HCQ 400mg 1-0-1 (BD) on First day followed by 400mg/week for next 3 weeks

However, the treatment protocol as by advised by your physician shall be followed

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Annexure 4: Nutrition guide

Model Diet Plan
(Similar diet plan may be suggested as per staple diet suitable locally)

<table>
<thead>
<tr>
<th>On Rising</th>
<th>Coffee/Tea/Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>Mon</td>
</tr>
<tr>
<td>Break-fast 7:00 AM</td>
<td>Rava Idli</td>
</tr>
<tr>
<td>Mid-Morning 10:00 AM</td>
<td>Watermelon</td>
</tr>
<tr>
<td></td>
<td>Ragi Ganji</td>
</tr>
<tr>
<td>Lunch 1:00 PM</td>
<td>Pulka-2 nos + Palya + Rice + Dal + Curd</td>
</tr>
<tr>
<td>Evening 5:30 PM</td>
<td>Elaichi Banana + Marie Biscuits – 3 Nos/Protein biscuits- 2 Nos/Fresh Dates- 2 Nos + Mango bar (Vit-C rich)</td>
</tr>
<tr>
<td>Dinner 7:00 PM</td>
<td>Pulka-2 nos + Palya + Rice + Dal + Curd</td>
</tr>
<tr>
<td>Bedtime 9:00 PM</td>
<td>Flavoured Milk</td>
</tr>
</tbody>
</table>

**Do's**
- Eat whole grains such as brown rice, whole wheat flour, oats, millets, etc.
- Include beans, lentils & pulses as these are good sources of protein
- Include fresh fruits & vegetables (Bright coloured fruits & vegetables like red capsicum, carrots, beetroot & greens etc.)
- Drink 8-10 Glasses of water and Hydrate yourself. Water helps to flush out toxins
- Citrus fruits like lemons & oranges are a good source of Vit C which is key in improving immunity levels & to fight off infections
- Include spices like ginger, garlic & turmeric which are natural immunity boosters
- Eat home-cooked food. Use low fat and less oil for cooking food
- Wash fruits & vegetables before use Include Low-fat milk & yogurt as they are good sources of protein & calcium

**Don'ts**
- Strictly avoid alcoholic drinks
Annexure 5: Fitness certificate for release from home isolation

(To whomsoever it may concern)

This is to certify that……………………………… S/W of ………………………………, residing at…………………………………… has satisfactorily completed home isolation for COVID-19. He/ she is deemed fit to resume his/her duties.

Signature of Medical officer/ Treating Physician

Name:

Date:

*****

Page 12 of 12
21.1.2 Scheme for COVID-19 patients

NOTIFICATION

Whereas the State Government recognizes that the State is threatened with the spread of COVID-19 epidemic, already declared as a pandemic by the World Health Organization. A large number of persons affected by COVID-19 are in the need of treatment, which at present is being mainly provided by Public Health institutions (PHIs) and it has become imperative to involve private hospitals, nursing homes etc.,(herein after referred as Private Healthcare Providers(PHPs)) registered under KPME Act, in the treatment of such patients.

Whereas the National Health Authority in its Office Memorandum No. S-12015/20/2020-NHA(HN&QA), dated 04.04.2020 has directed to utilize codes available in the Ayushman Bharat-Arogya Karnataka (Ab-Ark) scheme for payments and has allowed the State to decide the cost of additional requirements like PPEs and other consumables that would add to the package rates.

Whereas a Committee headed by Executive Director, Suvarna Arogya Suraksha Trust (SAST) was constituted by the Government vide G.O. No. Aakaka 197 (a) Aamuka 2020, dated 4.6.2020 with the mandate of submitting a proposal for fixing the package rates for the treatment of COVID-19 patients for General ward, HDU, ICU without ventilator and ICU with ventilator.

Whereas the Committee held many rounds of consultations with the Associations of private hospitals, chains of hospitals and other private hospitals and has submitted its report. The report of the Committee was placed before the Task Force Committee in their meeting held on 18.6.2020. The Task Force Committee after going through the package rates recommended obtaining Government approval for the rates suggested by the Committee. The Government has accepted the package rates suggested by the Committee.

Now, therefore, in exercise of the powers conferred under the Disaster Management Act, 2005, the undersigned in his capacity of Chairman of the State Executive Committee, under the Powers vested under Section 24(I) and Section 24(I) of the Disaster Management Act, 2005, issues the following orders to share the number of beds in private hospitals between Government referred and Private patients and to regulate the package rates to be charged by the PHPs for the treatment of Government referred COVID-19 patients and the Package rate ceiling for treating Private COVID-19 patients:

(1) 50% of the beds in Private hospitals having facilities to treat COVID-19 patients shall be reserved for the treatment of patients referred by the public health authorities. This will -
include the HDU and ICU beds both with and without ventilator. The hospitals may utilize the remaining 50% of COVID beds for admitting COVID-19 patients privately.

(2) The following package rates inclusive of PPEs and other consumables shall apply for the treatment of COVID patients:

(a) Package rates for COVID-19 patients referred by the Public Health Authorities shall be as follows:

1. General ward - Rs.5,200/-
2. HDU - Rs.7,000/-
3. Isolation ICU without ventilator - Rs.8,500/-
4. Isolation ICU with ventilator - Rs.10,000/-

(b) Package rate ceilings for private COVID-19 patients directly admitted by PHPs making cash payment (non-insurance) shall be as follows:

1. General ward - Rs.10,000/-
2. HDU - Rs.12,000/-
3. Isolation ICU without ventilator - Rs.15,000/-
4. Isolation ICU with ventilator - Rs.25,000/-

(3) The terms and conditions connected to the treatment of COVID-19 patients in the private hospitals shall be as follows:

(i) These rates will not be applicable for the patients subscribing to insurance packages as well as for the agreements / MOUs entered into between the hospitals and corporate entities.
(ii) While calculating 50% of the beds to be utilized by the Government patients, the number will be counted irrespective of the fact that the beds are located in general wards, sharing wards or in private wards.
(iii) The package rate ceilings for private patients are for General Wards / Multi Sharing Wards. An additional 10% may be charged for Twin Sharing Wards & 25% more for Single Rooms. There will be no ceiling for Suites.
(iv) Requisitioning of hospitals for sending government patients will be done by Commissioner, BBMP in respect of BBMP area Bangalore Urban and Bangalore Rural Districts and Deputy Commissioners in respect of other districts.
(v) In respect of unforeseen complications / surgeries / other co-morbid conditions / pregnancy etc., of the COVID-19 patients additional packages under AB-ArK packages will apply.
(vi) The Clinical Treatment and Discharge protocols issued by the State Government from time to time shall be strictly followed.
(vii) All the hospitals shall get empanelled through the online portal of the Suvarna Arogya Suraksha Trust with desktop review of statutory documents by the SAST on a fast forward basis.

(viii) Referral of a COVID-19 patient by a Public Health Authority will be treated as Auto Authorization by SAST.

(ix) All COVID-19 patients including those belonging to BPL and APL categories, migrant labourers and interstate returnees not possessing PDS card shall be considered as eligible in view of the unprecedented pandemic situation.

(x) There should be no compromise on the quality of medical services rendered to the patients referred by the Public Health Authorities and those admitted privately.

(xi) The Suvarna Arogya Suraksha Trust will be the Nodal Agency for the settlement of claims.

(4) Non-compliance to this Order will attract punishment under the relevant Sections of the Disaster Management Act, 2005 and the Indian Penal Code.

(5) This order will be in operation until further orders.

Srinivas
(T.M. Velayudhan)
Chief Secretary to Government & Chairman, State Executive Committee, SDMA

To: The Compiler, Karnataka Gazette, Bangalore for publication in the Special Gazette immediately.

Copy for information, compliance and circulation to all the concerned:
1. The Commissioner, BBMP / Special Commissioner, BBMP.
2. Additional Chief Secretary to Govt., HFW Dept
3. All the Regional Commissioner in the State of Karnataka.
4. The Commissioner / Director, Department of Health and Family Welfare, Bangalore.
5. Executive Director, Suvarna Arogya Suraksha Trust.
6. All the Deputy Commissioners in the State of Karnataka.
7. Mission Director, NHM Bangalore.
8. The Director, Medical Education, Bangalore.
9. All Divisional / Joint Directors, Health and Family Welfare Department.
10. Chief Health Officer, BBMP.
11. The President, Indian Medical Association, Karnataka for information and circulation to all the members.
12. All the District Health Officers / District Surgeons / Administrative Medical Officers and Taluk Medical Officers and Medical Superintendents of all General Hospitals in Karnataka.
13. All Private Medical Establishments in the State.
21.1.3 Insurance scheme for Health workers

CIRCULAR


With reference to the above subject and as per the reference letter from MoHFW, Dept. of Health & Family Welfare, Nirman Bhavan, New Delhi dated: 28-03-2020 and DO letter from the Secretary, Govt. of India Dept. of Health & Family Welfare, Ministry of Health and Family Welfare No. Z.21020/16/2020-PH Dated: 30-03-2020 “Pradhan Mantri Garib Kalyan Package insurance scheme for Health Workers fighting COVID-19” provides an insurance cover of Rs. 50.00 Lakh for health care providers, including community health workers who may be at risk of being impacted with COVID-19. This insurance cover is applicable to private health care providers who are in direct contact and providing care of COVID-19 patients. (The reference letter and guidelines letter are enclosed)

To:
1. DHO of all districts.
2. API, IAP, PHANA, IMA, Pulmonology.
3. Dean and Director of Medical colleges.

Copy to:
1. Additional Chief Secretary, HFW, Vikas Soudha, Bengaluru, for kind information.
2. Commissioner, HFW, Bengaluru, for kind information.
3. MD, NHM, Bengaluru, for kind information.
4. Vice Chancellor, RGUHS.
5. DC of all districts.
6. CEO of all districts.
7. DME, Medical Education.
8. Joint Director (Medical), HFW
9. Office Copy
As per the announcement made under the Pradhan Mantri Garib Kalyan Package, the competent authority has approved the launch of ‘Pradhan Mantri Garib Kalyan Package; Insurance Scheme for Health Workers Fighting COVID-19’ with the following conditions:

i. It will be a comprehensive personal accident cover of Rs. 50 lakh for ninety (90) days to a total of around 22.12 lakh public healthcare providers, including community health workers, who may have to be in direct contact and care of COVID-19 patients and who may be at risk of being impacted by this. It will also include accidental loss of life on account of contracting COVID-19;

ii. On account of the unprecedented situation, private hospital staff/retired/volunteer/local urban bodies/contract/daily wage/ad-hoc/out-sourced staff requisitioned by States/ Central hospitals/autonomous hospitals of Central/States/UTs, AIIMS & INIs hospitals of Central Ministries can also be drafted for COVID19 related responsibilities. These cases will also be covered subject to numbers indicated by MoHFW;

iii. The scheme will be funded through the NDRF Budget operated by the Health Ministry for this purpose;

iv. Actual payment by the Insurance Company the beneficiary will be under certification of the authorised Central/ State Government Officials; and

v. The insurance provided under this scheme would be over and above any other insurance cover being availed by the beneficiary.

2. This Order is issued with the concurrence of Integrated Finance Division vide their CD no. 4593.

[Signature]
Joint Secretary to the Government of India

Scanned with CamScanner
21.1.4 Quarantine and testing of Healthcare workers

GOVERNMENT OF KARNATAKA

No. HFW/248/ACS/2020

Karnataka Government Secretariat
Vikasa Soudha,
Bengaluru, dated: 13.07.2020

CIRCULAR

Subject: Quarantine and testing of healthcare workers following ‘high risk exposure’ to COVID positive person.

In view of increase in number of COVID-19 cases in the State, more and more healthcare workers are getting exposed to COVID-19 infection. In this context, to ensure safety and continual availability of health care workers both in hospital and community settings, the following guidelines are issued.

Quarantine:

- Following a ‘high risk exposure*’ to a COVID-19 positive case, the healthcare worker shall be advised home quarantine for 7 days.
- In case home quarantine is not feasible, institutional quarantine shall be arranged by government/private health institution.

Testing:

- If the healthcare worker is symptomatic, the person shall be immediately tested for COVID-19.
- If health care worker is asymptomatic, the person shall be tested for COVID-19 on 7th day after high risk exposure to a COVID positive case.
- If the test result is negative, such healthcare workers shall be allowed to resume duty.

*High risk exposure:

- Had direct physical contact with COVID positive person including physical examination without PPE.
- Anyone in close proximity (within 1 meter/3 feet) of the confirmed case without appropriate PPE.
- Accidentally has come in contact with body fluids of the patient like respiratory secretions, blood, vomit, saliva, urine, faeces, etc.
- Touched or cleaned the linens, clothes, or utensils of the COVID-19 positive person.
- Lives in the same household as the COVID-19 positive person.
- Passenger in close proximity of within 1 meter and travelling for more than 6 hours duration with a symptomatic person, who later tested positive for COVID-19.

Copy to:

1. Commissioner-BBMP
2. Commissioner-Health and Family Welfare Services, Bengaluru
3. Mission Director-NHM, Bengaluru
4. Deputy Commissioners of all Districts

Additional Chief Secretary to Government
Health and Family Welfare Department
5. CEOs of ZP of all Districts
6. Director, HPWS, Bengaluru
7. Director, Medical Education Department
8. District Health and Family Welfare Officers/ District Surgeons of Bengaluru Urban

Copy for kind information to:

1. Chief Secretary to GoK, Vidhana Soudha
2. ACS to Hon. Chief Minister, Vidhana Soudha
3. Principal Secretary, Medical Education
21.1.5 Guidelines on the use of Rapid Antigen Testing kits for COVID-19

No. HFW/246/ACS/2020
Karnataka Government Secretariat
Vikasa Soudha,
Bengaluru, dated: 10.07.2020

CIRCULAR

Subject: Guidelines on the use of Rapid Antigen Testing kits for COVID-19

Reference:
1. ICMR-GOI advisory on newer additional strategies for COVID-19 testing dated 23/06/2020
2. Order No. HFW 205 CGM 2020 regarding revised lab testing protocol –Karnataka dated 08.06.2020
3. Addendum to revised lab testing protocol dated 09.06.2020

In view of evolving situation of COVID-19 in Karnataka, testing protocol has been revised from time to time. There is a need to enhance testing using a reliable point-of-care (PoC) rapid antigen detection test with good sensitivity and specificity for early detection of infection. Based on the advisory issued by ICMR on rapid antigen detection test kits, the following guidelines are issued.

A. The COVID-19 antigen detection tests are recommended as mentioned in the flowchart in Annexure-1

B. All hospitals, laboratories, medical establishments (both government and private) intending to perform rapid antigen tests should mandatorily register with ICMR, and enter positive and negative results of each person on ICMR portal (Annexure-2). Failure to register with ICMR or uploading COVID-19 results of each person on portal will be liable for action under Epidemic Diseases Act.

C. Brief description and video guide link for PoC Rapid Antigen Test as mentioned in Annexure-3 shall be followed.

D. The testing protocol issued by Government of Karnataka in reference (2) & (3) vide above should be strictly followed.
E. The following categories shall be given priority for Rapid Antigen testing: ILI in containment zones and fever clinics, SARI, suspected COVID-19 deaths, healthcare workers, international travellers and asymptomatic patients undergoing chemotherapy, immunosuppressed patients including those who are HIV positive, patients diagnosed with cancer, transplant patients, elective and emergency surgical procedures, etc.

[Signature]
Additional Chief Secretary to Government
Health and Family Welfare Department

Copy to,

1. Commissioner-BBMP
2. Commissioner-Health and Family welfare services, Bengaluru
3. Mission Director NHM, Bengaluru
4. Deputy Commissioners of all districts
5. CEOs of ZP of all districts
6. Director- HFWS, Bengaluru
7. Director, Medical Education Department
8. District Health and Family welfare officers/ District Surgeons of Bengaluru Urban
9. All COVID-19 testing labs in the state

Copy for kind information to:

1. Chief Secretary to GoK, Vidhana Soudha
2. ACS to Hon. Chief Minister, Vidhana Soudha
3. Principal Secretary, Medical Education
Annexure 1: Flow chart for COVID-19 testing

Person requires COVID-19 Test (as per Government of Karnataka protocol)

Rapid Antigen Test Kit

Available

Rapid Antigen Test done

Positive

Asymptomatic

To be reported as ‘Positive’
(RT-PCR test not required)

Negative

Symptomatic

Collect fresh nasopharyngeal swab and throat swab in UTM tube

Result urgently needed*

Result not urgent

True-NAT or CBNAAT available

Positive

RT-PCR

True-NAT or CBNAAT NOT available

Negative

To be reported as ‘Positive’

To be reported as ‘Negative’

*Death, SARI, HCW after high risk exposure

Page 3 of 5

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
Annexure-2

Rapid antigen PoC test is recommended for use subject to the following conditions:

i) All hospitals, laboratories, medical establishments (both government and private) intending to perform rapid antigen tests 'should mandatorily register with ICMR, and enter positive and negative results of each person on ICMR portal. Failure to register with ICMR or uploading COVID-19 results of each person on portal will be liable for action under epidemic diseases Act.

For registration with ICMR and to obtain the login credentials for data entry, send request on the following email id’s:

ag-pythosp-nabh@icmr.gov.in
ag-govthosp@icmr.gov.in

ii) All data of testing needs to be entered into the ICMR portal on a real time basis. The ICMR portal has been modified to include a component on antigen testing. Detailed video is available on ICMR website at:

http://www.icmr.gov.in/video/Data_Entry_Antigen_v4.mp4

iii) All labs/hospitals initiating testing through the rapid antigen PoC test need to ensure that all ‘symptomatic negative patients’ should be essentially referred to a RT-PCR/CBNAAT/True-NAAT test for COVID-19. This is particularly essential as the rapid antigen PoC test has a moderate sensitivity. Fresh nasopharyngeal swab and throat swab shall be collected in VTM tube for such patients requiring RT-PCR/CBNAAT/True-NAAT test.
Annexure 3: Brief description on the COVID-19 Rapid Antigen detection kit

- Samples (only nasopharyngeal swab) shall be collected by a trained healthcare worker following full infection control practices including the use of full PPE kit.

- The test should be conducted on-site under strict medical supervision with maintaining kit temperature between 2° to 30° C and within one hour of sample collection in extraction buffer Standard QI COVID-19 Ag detection

- Each Standard QI COVID-19 Ag detection kit comes with an inbuilt COVID antigen test device, viral extraction tube with viral lysis buffer and sterile swab for sample collection.

- One Nasopharyngeal swab needs to be collected using the customized sample collection swab provided with the kit. No other sample (throat swab, bronchoalveolar lavage or sputum) should be used.

- After sample collection, the swab should be immersed and squeezed in the viral extraction buffer, provided with the kit. This buffer inactivates the virus thereby reducing biosafety and bioburden requirements. The test does not work if the sample is collected in the usual Viral Transport Media (VTM), routinely used for collection of OP/NP swabs.

- Once the sample is collected in the extraction buffer, it is stable only for one hour. Therefore, the antigen test needs to be conducted at the site of sample collection in the healthcare setting. Transportation to the lab is not recommended.

- Once the sample goes into the buffer and is mixed properly, the buffer tube cap needs to be replaced with a nozzle provided with the kit and 2-3 drops of the sample with buffer are put into the well of the test strip.

- The test can be interpreted as positive or negative after 15 minutes of putting the sample into the well by appearance of test and control lines, which can be read with a naked eye, requiring no specialized equipment. Minimum duration for interpreting a positive or negative test is 10 minutes. After that the test strip should be discarded.

- The test kit should be stored between 2° to 30° C.

- Detailed instructions for use can be accessed through the video link:

  https://youtu.be/mI3daQHiWx4
Dear Citizens,

We have received 100% of the beds in the following hospitals along with the beds in Government run institutions for treatment to COVID-19 patients and this list will be updated by central and allied institutions on completion of treatment. The name of these hospitals with RTF and positive ward where the admission and treatment will be provided by the hospital subject to the availability of the beds at other hospitals which the ceiling has been prescribed by the Government.

The patients with severe distress shall not be denied admission in any institution even if the lab reports are not available.

COVID-19 patients can contact these Hospitals. In case of any inconvenience, you may contact Nodal person.

For more information/details call TOLL-FREE NUMBER 11117

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of the Hospitals</th>
<th>Address of the Hospital</th>
<th>Hospital Contact</th>
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<tbody>
<tr>
<td>1</td>
<td>Apollo Institute of Medical Sciences &amp; Research Centre</td>
<td>No. 2/PP Amma, Natural Park, Mysuru - 570014</td>
<td>Nishanta Phagumbe Tel: 0821-2323225</td>
</tr>
<tr>
<td>2</td>
<td>Aru Hospital</td>
<td>No. 3, Sector 1, Old Pete, Mysuru, Mysuru-570001</td>
<td>Chitravati Amravati Tel: 0821-2323225</td>
</tr>
<tr>
<td>3</td>
<td>Asthagiri Medical College</td>
<td>No. 1, Asthagiri Medical College, Mysuru 570037</td>
<td>Santosh Gopal Tel: 0821-2323225</td>
</tr>
<tr>
<td>4</td>
<td>Asthma &amp; Pulmonary Hospitals, Bangalore</td>
<td>No. 9, 1st Floor, J. P. Road, Bangalore 560004</td>
<td>Pratap Bhargava Tel: 0821-2323225</td>
</tr>
<tr>
<td>5</td>
<td>Asthma Speciality Hospitals, Bangalore</td>
<td>No. 1/1, 2nd Floor, J. P. Road, Bangalore 560004</td>
<td>Bhagawan Yelagiri Tel: 0821-2323225</td>
</tr>
<tr>
<td>6</td>
<td>Asthma Speciality Hospitals, Bangalore</td>
<td>No. 5, 1st Floor, J. P. Road, Bangalore 560004</td>
<td>Babu Ramakrishna Tel: 0821-2323225</td>
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<tr>
<td>7</td>
<td>Asthma Speciality Hospitals, Bangalore</td>
<td>No. 7, 1st Floor, J. P. Road, Bangalore 560004</td>
<td>Radhakrishna Tel: 0821-2323225</td>
</tr>
</tbody>
</table>

For more information/details call TOLL-FREE NUMBER 11117

In case the patient is unable to contact Hospitals/Nodal person, they can call Toll-Free Number 11117

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
# 21.2 COVID-19 Designated Government and Private Hospitals

## COVID 19 Government Hospitals

<table>
<thead>
<tr>
<th>Place</th>
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<th>Contact</th>
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<tr>
<td>Bagalkote</td>
<td>District Hospital</td>
<td>DH Navanagar Bagalkot</td>
<td>08354-236260</td>
</tr>
<tr>
<td>Ballari</td>
<td>District Hospital</td>
<td>Modalimar DH Rajkumar Road Sangam Circle</td>
<td>08392-274254</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Bowrung Medical College</td>
<td>BOWRING LADY CURZON, Lady Curzon road, Shivajinagar, Bengaluru - 560001</td>
<td>9036304558</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Victoria Hospital</td>
<td>BMCRJ Fort Road near City Market, New Taragupet, Bengaluru - 560002</td>
<td>080-26701150</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Command Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bengaluru</td>
<td>HAL Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Sir.C.V.Raman General Hospital</td>
<td>No.68/1,9th B cross, Michael Paley, Indiranagar, Bengaluru-560038</td>
<td>+91-80-2528-1245</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>ESIC Hospital</td>
<td>Survey No 11-55-1, Plot No 1, 5 Main Road, Pti Campus, Yeshwanthpur, Bangalore-560022</td>
<td>+91-80-2972-3468</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>General Hospital</td>
<td>Near T B Circle, Chikkaballapura Main Road, Doddaballapura Bangalare Rural - 561203</td>
<td>+91-80-2762-2141</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Taluk General Hospital</td>
<td>General Hospital (Hoskote), NH-4, Old Madras Road, Santheget, Hoskote - 562114</td>
<td>+91-94482-10755</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>ED Hospital</td>
<td>Indiranagar 1st Stage, Hoysala nagara, Bengaluru - 560038</td>
<td>+91-80-2551-0258</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Jayanagar General Hospital</td>
<td>4th Block, Jayanagar, Bengaluru - 560011</td>
<td>+91-80-2244-5711</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>K.C. General Hospital</td>
<td>5th Cross, Malleshwaram, Bengaluru - 560003</td>
<td>+91-80-2334-4022</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Rajiv Gandhi Institute Of Chest Disease</td>
<td>Someshwarana nagara, 1st Main Road, Dharvaram College Post, Near NIMHANS Bengaluru - 560029</td>
<td>+91-80-2608-8682</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Yelahanka Taluka Hospital</td>
<td>Yelahanka, Bengaluru-560064</td>
<td>+91-80-2856-4436</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>GH Anekal</td>
<td>Near KSRTC Bus Stand, Anekal, Anekal Taluk, Bangalore Urban-562106</td>
<td>+91-80-2785-9291</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>K.R.Puram Taluk Hospital</td>
<td>Old Madras Road, Bengaluru-560036</td>
<td>+91-80-2561-2238</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>ESIC Model Hospital PGIMSR</td>
<td>#2366/27, 12th Main, 2nd Stage A Block, Rajajinagara 3rd Block, Bengaluru - 560010</td>
<td>+91-80-2332-0271</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>General Hospital (Nelamanagala)</td>
<td>BH Road, Nelamangala, Near Police Station and Mini Vidhana Soudha, Bengaluru Rural - 562123</td>
<td>+91-80-2772-2808</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>General Hospital 562110</td>
<td>Devanahalli, Binnamangala - 561210</td>
<td>+91-80-2978-0027</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>Indira Gandhi institute of Child Health</td>
<td>1st Block, Siddapura, Jayanagar, Bengaluru, Karnataka 560029</td>
<td>+91-80-2244-3414</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>ESI Indira Nagar</td>
<td>7th main road Appareddipalya, Indiranagar, Bengaluru-560008</td>
<td>+91-80-2526-6993/4</td>
</tr>
<tr>
<td>Belagavi</td>
<td>BIMS</td>
<td>Dr B R Ambedkar Road, Belagavi</td>
<td>0831-2420320</td>
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<td>Bidar</td>
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<td>Chamarajnagar</td>
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<td>Chikkaballapur</td>
<td>District Hospital</td>
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<td>Chitradurga</td>
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<td>Haveri</td>
<td>District Hospital</td>
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<td>08375-234231</td>
</tr>
<tr>
<td>Kalaburagi</td>
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<td>8742265546</td>
</tr>
<tr>
<td>Kodagu</td>
<td>KIMS, Kodagu</td>
<td>Near Toll Gate, Kodagu</td>
<td>08272-221448 08272-298220</td>
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<tr>
<td>Kolar</td>
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<td>Koppal</td>
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<tr>
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<td>District Hospital</td>
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<td>0821-2517555</td>
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</table>

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
<table>
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<th>Sl. No.</th>
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<td>Bagalkot</td>
<td>Extensive Area Mahaveer Road Bagalkot Dist Bagalkot 587101</td>
<td>8354226533</td>
<td><a href="mailto:dhanushpati@rediffmail.com">dhanushpati@rediffmail.com</a></td>
</tr>
<tr>
<td>2</td>
<td>M S Kerudi Hospital And Research Centre Bagalkot</td>
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<td>Oph Axis Bank Extension Area Bagalkot 587101</td>
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<td><a href="mailto:kerudikgk@gmail.com">kerudikgk@gmail.com</a></td>
</tr>
<tr>
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<td>166A 1A Near Old Ib Extension Area Bagalkot 587101</td>
<td>7829907977</td>
<td><a href="mailto:abasitchkp@gmail.com">abasitchkp@gmail.com</a></td>
</tr>
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<td>8350271236</td>
<td><a href="mailto:ajitvijayho@yahoo.co.in">ajitvijayho@yahoo.co.in</a></td>
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<tr>
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<td>Bagalkot</td>
<td>Laxmi Nagar Near Rural Police Station Bagalkot</td>
<td>8354221888</td>
<td><a href="mailto:daddanavarchospital@yahoo.co.in">daddanavarchospital@yahoo.co.in</a></td>
</tr>
<tr>
<td>7</td>
<td>Ashirwad Hospital</td>
<td>Bagalkot</td>
<td>VithalS Vantage Building Deepam Colony Near Rotary Circle Bagalkot 587101</td>
<td>9008663093</td>
<td><a href="mailto:chimsagasi@gmail.com">chimsagasi@gmail.com</a></td>
</tr>
<tr>
<td>8</td>
<td>Dr R G Karudagimath Memorial Nursing Home Badami</td>
<td>Bagalkot</td>
<td>Tippu Nagar Station Road Badami Bagalkot</td>
<td>8357220191</td>
<td><a href="mailto:sunilkarudagimath@hotmail.com">sunilkarudagimath@hotmail.com</a></td>
</tr>
<tr>
<td>9</td>
<td>Dr Katti Hospital</td>
<td>Bagalkot</td>
<td>Bendigeri Layout Extension Area Bagalkot 587101</td>
<td>9845378505</td>
<td><a href="mailto:kattihospital@gmail.com">kattihospital@gmail.com</a></td>
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<tr>
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<td>Spandana Multispeciality Hospital</td>
<td>Bagalkot</td>
<td>Pm Nadaguruda Road Virayak Nagar Bagalkot</td>
<td>8354226688</td>
<td><a href="mailto:siddappasm02@gmail.com">siddappasm02@gmail.com</a></td>
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<tr>
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<td>Dr A R Belgali Surgical Clinic And Maternity Home</td>
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<td>Dr A R Belgali Surgical Clinic And Maternity Home Vidyavangar Mudhol Road Mahalingpur Bagalkot 587101</td>
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<td><a href="mailto:drbelgalaghospital@gmail.com">drbelgalaghospital@gmail.com</a></td>
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<td>Arogyadharm Hospital</td>
<td>Bagalkot</td>
<td>Arogyadharn Hospital Gokak Road Mahalingpur Bagalkot 587101</td>
<td>8350270839</td>
<td><a href="mailto:drchandimalp@gmail.com">drchandimalp@gmail.com</a></td>
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<tr>
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<td>Sai Aadhari Hospital Cts No 4018 4026 A1 D 789 Yadawad Road Mudhol 587112</td>
<td>8350280720</td>
<td><a href="mailto:sainaadhari2010@gmail.com">sainaadhari2010@gmail.com</a></td>
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<tr>
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<td>Bagalkot</td>
<td>Near Lion B School Extension Area Bagalkot</td>
<td>8354221121</td>
<td><a href="mailto:girishbanagar@rediffmail.com">girishbanagar@rediffmail.com</a></td>
</tr>
<tr>
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<td>Riti Life Care Hospital</td>
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<td>8350270916</td>
<td><a href="mailto:drmanc7@gmail.com">drmanc7@gmail.com</a></td>
</tr>
<tr>
<td>16</td>
<td>Patil Medicare Multispeciality Hospital Bagalkot</td>
<td>Bagalkot</td>
<td>Behind Kerudi Hospital Bagalkot 587101</td>
<td>8354221933</td>
<td><a href="mailto:patilmediccarehospital@gmail.com">patilmediccarehospital@gmail.com</a></td>
</tr>
<tr>
<td>17</td>
<td>Bests Kuntoji Multispeciality Hospital Bagalkot</td>
<td>Bagalkot</td>
<td>Plot No D1 Sector No 20 Near Kalahasvan Navanagaran Bagalkot</td>
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<td>Bagalkot</td>
<td>Rotary Circle Navanagar Road Bagalkot 587101</td>
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<td>SNMC Hs Hospital Navanagar Bagalkot 587102</td>
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<td>JOSHHUALLI OPP BB BAGALKOT</td>
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<td>Bagalkote</td>
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<td>Citi Hospital S2 A Near Life Office Dam Road Hosptel Bellary 583203</td>
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<td>Shri J G Co Operative Hospital Society Ltd Dr Gangadhar Nagar Ghatpahabrah Gokak Belagavi 591307</td>
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<td>8312432999</td>
<td><a href="mailto:vijayaothandtraumacentre14@gmail.com">vijayaothandtraumacentre14@gmail.com</a></td>
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**COVID 19 Private Hospitals**

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
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<td>Karnataka Health Institute</td>
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<td>Shree Ortho And Trauma Centre</td>
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<td>Kottureshwara Hospital</td>
<td>Shivamogga</td>
<td>0th Ward 100 Ft Road Vinayaka Nagar Shimoga 577201</td>
<td>9449400000</td>
<td><a href="mailto:drkottureswh@gmail.com">drkottureswh@gmail.com</a></td>
</tr>
<tr>
<td>394</td>
<td>Unity Center For Advanced Pediatric Care</td>
<td>Shivamogga</td>
<td>Kuvempu Road Bhavarrathi Nagaram 577201</td>
<td>9739963933</td>
<td><a href="mailto:unitycenterpc@gmail.com">unitycenterpc@gmail.com</a></td>
</tr>
<tr>
<td>395</td>
<td>Durga Nursing Home</td>
<td>Shivamogga</td>
<td>B H Road Bhadravathi</td>
<td>9449836532</td>
<td><a href="mailto:durphospital267225@gmail.com">durphospital267225@gmail.com</a></td>
</tr>
<tr>
<td>396</td>
<td>Mallikarjun Nursing Home</td>
<td>Shivamogga</td>
<td>Hotel Jewel Rock Road Durugudi Shimoga</td>
<td>9448125850</td>
<td><a href="mailto:mallikarjunahospital@yahoo.in">mallikarjunahospital@yahoo.in</a></td>
</tr>
<tr>
<td>397</td>
<td>Nirnala Hospital</td>
<td>Shivamogga</td>
<td>Taluk Office Road Old Town</td>
<td>9449551275</td>
<td><a href="mailto:nirnala@gmail.com">nirnala@gmail.com</a></td>
</tr>
<tr>
<td>398</td>
<td>Mudra Hospital</td>
<td>Tumkur</td>
<td>KR Extension 3 Rd Main Road Tiptur</td>
<td>8134250100</td>
<td><a href="mailto:tipturct@gmail.com">tipturct@gmail.com</a></td>
</tr>
<tr>
<td>399</td>
<td>Swathi Hospital</td>
<td>Tumkur</td>
<td>Swathi Hospital Gandhi Nagar Near Canara Bank Road Sira 572137</td>
<td>8135276212</td>
<td><a href="mailto:swathihospitalap@gmail.com">swathihospitalap@gmail.com</a></td>
</tr>
<tr>
<td>400</td>
<td>Raghu Hospital</td>
<td>Tumkur</td>
<td>Balajinagara Sira Tumkur</td>
<td>9880839084</td>
<td><a href="mailto:drraghuok@gmail.com">drraghuok@gmail.com</a></td>
</tr>
<tr>
<td>401</td>
<td>Kumar Hospital</td>
<td>Tumkur</td>
<td>Kumar Hospital Mst Road Tiptur</td>
<td>8134253176</td>
<td><a href="mailto:mstipturct@yahoo.co.in">mstipturct@yahoo.co.in</a></td>
</tr>
<tr>
<td>402</td>
<td>Mm Multi Speciality Hospital</td>
<td>Tumkur</td>
<td>Mm Multi Speciality Hospital Krs Agrahara Bm Road Kunigal 572130</td>
<td>8132220033</td>
<td><a href="mailto:m.m.hospital12@gmail.com">m.m.hospital12@gmail.com</a></td>
</tr>
<tr>
<td>403</td>
<td>Secretary Sri Siddartha Academy Of Higher Education</td>
<td>Tumkur</td>
<td>Aglapalote Tumkur B H Road</td>
<td>9482434714</td>
<td><a href="mailto:info@ssmtumkur.org">info@ssmtumkur.org</a></td>
</tr>
<tr>
<td>404</td>
<td>Shridevi Institute Of Medical Sciences And Hospital</td>
<td>Tumkur</td>
<td>Shridevi Institute Of Medical Sciences Nh4 Sira Road Tumkur 572106</td>
<td>8162211999</td>
<td><a href="mailto:Raman.shridevi@gmail.com">Raman.shridevi@gmail.com</a></td>
</tr>
<tr>
<td>405</td>
<td>Tumkur Specialty Hospital</td>
<td>Tumkur</td>
<td>Tumkur Specialty Hospital 4th Cross KR Extension Barline Road Tumkur 572102</td>
<td>9844777202</td>
<td><a href="mailto:shashipersa6@gmail.com">shashipersa6@gmail.com</a></td>
</tr>
<tr>
<td>406</td>
<td>Sharada Hospital For Mother and child</td>
<td>Tumkur</td>
<td>Sharada Hospital For Mother And Child Peshramani Mohalla Nr 4 Road Sira 572137</td>
<td>8135277527</td>
<td><a href="mailto:drraga2kt1@yahoo.co.in">drraga2kt1@yahoo.co.in</a></td>
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<tr>
<td>407</td>
<td>Swami Vivekananda Integrated Rural Health Centre</td>
<td>Tumkur</td>
<td>Swami Vivekananda Integrated Rural Health CentreSharahadadi Eye Hospital Swami Vivekananda Nagarapaguda Tumkur 561202</td>
<td>8136244030</td>
<td><a href="mailto:swapanjaji@yahoo.com">swapanjaji@yahoo.com</a></td>
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<tr>
<td>408</td>
<td>Spandana Nursing Home</td>
<td>Tumkur</td>
<td>Spandana Nursing Home Dr Rajkumar Road Huliyar Chikkanayakanahalli 572218</td>
<td>8133257111</td>
<td><a href="mailto:dr.khs18271@gmail.com">dr.khs18271@gmail.com</a></td>
</tr>
<tr>
<td>409</td>
<td>Shri Vijaya Nursing Home</td>
<td>Tumkur</td>
<td>Shri Vijaya Nursing Home Near Anakatte B H Road Tiptur 572201</td>
<td>8134250267</td>
<td><a href="mailto:dr.tharadevi@gmail.com">dr.tharadevi@gmail.com</a></td>
</tr>
<tr>
<td>410</td>
<td>Mookambikha Modi Eye Hospital</td>
<td>Tumkur</td>
<td>Mookambikha Modi Eye Hospital 3rd Main Shinh Dodda Maste Nursing Home Shankarapuram B H Road Tumkur 572102</td>
<td>8162254400</td>
<td><a href="mailto:mookambikhamediyehospital@yahoo.com">mookambikhamediyehospital@yahoo.com</a></td>
</tr>
<tr>
<td>411</td>
<td>Ganadal Ent And Dental Hospital</td>
<td>Tumkur</td>
<td>Ganadal Ent And Dental Hospital 3rd Cross Puram Tumkur 572102</td>
<td>8162271225</td>
<td><a href="mailto:munish_ent@yahoo.com">munish_ent@yahoo.com</a></td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Name</td>
<td>District</td>
<td>Address</td>
<td>Phone number</td>
<td>Mail id</td>
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<tr>
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<tr>
<td>463</td>
<td>Al Ameen Medical College Hospital</td>
<td>Vijayapura</td>
<td>Al Ameen Medical College Hospital Al Ameen Campus Athani Road Vijayapur 586108</td>
<td>8352270077</td>
<td><a href="mailto:amcbhijapur@gmail.com">amcbhijapur@gmail.com</a></td>
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<tr>
<td>464</td>
<td>BiderDiShri B.M.Patil Medical College And Research Centre</td>
<td>Vijayapura</td>
<td>Bide University Shri Bin Patil Medical College Hosp Bangarma Sajjan Campus Asram Road Bijapur 586103</td>
<td>8352267770</td>
<td><a href="mailto:bdkhospatil@gmail.com">bdkhospatil@gmail.com</a></td>
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<tr>
<td>465</td>
<td>Mahalakshmi Children Hospital</td>
<td>Vijayapura</td>
<td>Mahalakshmi Children Hospital Jamkahan Street Menaxi Circle Vijayapur Bijapur 586101</td>
<td>8352264754</td>
<td><a href="mailto:dr.aasitn@gmail.com">dr.aasitn@gmail.com</a></td>
</tr>
<tr>
<td>466</td>
<td>Korbu Womens Care Hospital</td>
<td>Vijayapura</td>
<td>Korbu Womens Care Hospital Near Secab School behind Bus stand Vijayapur</td>
<td>8352230379</td>
<td><a href="mailto:drkorbus@gmail.com">drkorbus@gmail.com</a></td>
</tr>
<tr>
<td>467</td>
<td>SHRI SAI HOSPITAL</td>
<td>Vijayapura</td>
<td>S 32 33 VIJAYPUR BENGALURU HIGHWAY JUNCTION</td>
<td>8050499300</td>
<td>shri <a href="mailto:saisaihospital@yahoo.com">saisaihospital@yahoo.com</a></td>
</tr>
<tr>
<td>468</td>
<td>ANUAPURNA MULTI SPECIALITY HOSPITAL</td>
<td>Vijayapura</td>
<td>ANUAPURNA OPPOSITE KARIGODU LABORATORY GODbole MALA TAJ BAVADI ROAD VIJAYAPURA</td>
<td>8352242655</td>
<td><a href="mailto:dr.sureshk2007@yahoo.com">dr.sureshk2007@yahoo.com</a></td>
</tr>
<tr>
<td>469</td>
<td>Vaihav orthopaedic And Dental Care Hospital</td>
<td>Vijayapura</td>
<td>Mukund Nagar Station Road Near Madhuvan Hotel</td>
<td>8352244436</td>
<td><a href="mailto:info@vaihavhospital.com">info@vaihavhospital.com</a></td>
</tr>
<tr>
<td>470</td>
<td>Dr G R BHAT HOSPITAL TALIKOT</td>
<td>Vijayapura</td>
<td>Dr G R BHAT M G Road Opp Town Municipal Corporation Talikote</td>
<td>9972636472</td>
<td><a href="mailto:aanandhbit@yahoo.com">aanandhbit@yahoo.com</a></td>
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<tr>
<td>471</td>
<td>Patil Multispeciality Hospital</td>
<td>Vijayapura</td>
<td>menaxi chowk Vijayapura</td>
<td>9731467014</td>
<td><a href="mailto:venkat27mp@rediffmail.com">venkat27mp@rediffmail.com</a></td>
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<tr>
<td>472</td>
<td>Medhub Hospital</td>
<td>Vijayapura</td>
<td>Medhub Hospital Alipur Base JM Road Bijapur</td>
<td>8352241513</td>
<td><a href="mailto:sajidmedhub@yahoo.com">sajidmedhub@yahoo.com</a></td>
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<tr>
<td>473</td>
<td>Sparshah Multispeciality Hospital</td>
<td>Vijayapura</td>
<td>Opp Sainik School 2 nd Gate Athani Road Bijapur 586102</td>
<td>8073326926</td>
<td><a href="mailto:drdayaortho@gmail.com">drdayaortho@gmail.com</a></td>
</tr>
<tr>
<td>474</td>
<td>Shri Bhagavanti Multi speciality Hospital And Rs</td>
<td>Vijayapura</td>
<td>Shri Bhagavanti Multi speciality Hospital And Rs 10 Malikkarjum Nagar Near Ganesh Nagar Bus Stop Bijapur 586109</td>
<td>8352267070</td>
<td><a href="mailto:shribhagavantihospital888@gmail.com">shribhagavantihospital888@gmail.com</a></td>
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<tr>
<td>475</td>
<td>Dr Munir Bangi Hospital</td>
<td>Vijayapura</td>
<td>Dr Munir Bangi Hospital No 20 Doudal Koti Road Near Jamiai Manjid Bijapur 586101</td>
<td>8352253558</td>
<td><a href="mailto:drmunirbangihospitals@rediffmail.com">drmunirbangihospitals@rediffmail.com</a></td>
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<tr>
<td>476</td>
<td>Akki Hospital</td>
<td>Vijayapura</td>
<td>Akki Hospital Bhairav Nagar Near Swatantra Yodhar Colony Athani Road Vijayapur 583102</td>
<td>8352271488</td>
<td><a href="mailto:rajashreekhuba@gmail.com">rajashreekhuba@gmail.com</a></td>
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<td>Mathoshree Hospital</td>
<td>Vijayapura</td>
<td>Mathoshree Hospital Desai Chawl Menaksi Chouk Vijayapur 586101</td>
<td>8352255523</td>
<td><a href="mailto:drshaileshkg@rediffmail.com">drshaileshkg@rediffmail.com</a></td>
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<tr>
<td>478</td>
<td>Basaanagouda Patil Sunag Memorial Hospital</td>
<td>Vijayapura</td>
<td>New Vittal Madir Road Bijapur</td>
<td>9449838855</td>
<td><a href="mailto:drshpatilortho@gmail.com">drshpatilortho@gmail.com</a></td>
</tr>
<tr>
<td>479</td>
<td>Kembhavi Eye Hospital</td>
<td>Vijayapura</td>
<td>Kembhavi Eye Hospital Shivaji Circle Bijapur 586101</td>
<td>83522564995</td>
<td><a href="mailto:sulabhahs95@gmail.com">sulabhahs95@gmail.com</a></td>
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<tr>
<td>480</td>
<td>Anugraha Eye Hospital</td>
<td>Vijayapura</td>
<td>Anugraha Eye Hospital Navahbag Main Road Behind Central Bus Stand Near Secab College Bijapur 586101</td>
<td>8352220646</td>
<td><a href="mailto:Anugraha.eyehospital@gmail.com">Anugraha.eyehospital@gmail.com</a></td>
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<tr>
<td>481</td>
<td>Yashodhara Super Speciality Hospital Pvt Ltd</td>
<td>Vijayapura</td>
<td>107 2B Solapur Bypass Junction NH13 Bhatanal Vijayapur</td>
<td>8352264444</td>
<td><a href="mailto:yasho@yahdharahospital.com">yasho@yahdharahospital.com</a></td>
</tr>
<tr>
<td>482</td>
<td>alnabi hospital</td>
<td>Vijayapura</td>
<td>Near Zandakatta J M Road Vijayapur</td>
<td>9740811647</td>
<td><a href="mailto:farooqgundagi@gmail.com">farooqgundagi@gmail.com</a></td>
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<tr>
<td>483</td>
<td>Liymanız Usani Medical College Hospital</td>
<td>Vijayapura</td>
<td>12 Naubag Vijayapur 586101</td>
<td>8352204763</td>
<td><a href="mailto:principalumc@yahoo.co.in">principalumc@yahoo.co.in</a></td>
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</tbody>
</table>
21.3 Government District-wise Helplines

- To combat coronavirus, the Karnataka government has set up district-wise helpline numbers. The public can call these numbers to seek help. Below listed are the COVID-19 helpline numbers in Karnataka as well as district-wise.

COVID-19 Helpline Numbers in Karnataka

Coronavirus Queries: National Helpline Number – 1075 / 1800-112-545 / +91-11-2397-8046

Apthamitra for Medical Help – COVID-19 Symptoms
- Helpline: 14410
- Download the App [here](#)
- Timing: 8 AM to 8 PM

If you think that you have Coronavirus related symptoms such as cold, fever, cough or breathing difficulty, call the number or use the app. Medical experts will provide you the guidance.

The helpline Centers are located in:
- Bengaluru
- Mysore
- Mangalore
<table>
<thead>
<tr>
<th>District</th>
<th>Helpline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengaluru (urban)</td>
<td>+91-80-2296-7200</td>
</tr>
<tr>
<td>Bengaluru (rural)</td>
<td>+91-80-2978-1021</td>
</tr>
<tr>
<td>Bidar</td>
<td>+1-800-425-4316</td>
</tr>
<tr>
<td>Chamarajanagad</td>
<td>+91-80-2262-2316</td>
</tr>
<tr>
<td>Chikkaballapura</td>
<td>+91-81562-77071</td>
</tr>
<tr>
<td>Chikkamagaluru</td>
<td>+91-80-2622-38950</td>
</tr>
<tr>
<td>Chitradurga</td>
<td>+91-81942-22056/44/ 27/ 35</td>
</tr>
<tr>
<td>Davanagere</td>
<td>+91-81912-34034/1077</td>
</tr>
<tr>
<td>Dharwad</td>
<td>+91-83624-47547</td>
</tr>
<tr>
<td>Gadag</td>
<td>+91-83722-39177</td>
</tr>
<tr>
<td>Hassan</td>
<td>+91-81722-61111</td>
</tr>
<tr>
<td>Haveri</td>
<td>+91-83752-49102/4</td>
</tr>
<tr>
<td>Kalaburgi</td>
<td>+91-84722-78698/77/48/04</td>
</tr>
<tr>
<td>Uttara Kannada</td>
<td>+91-83822-29857</td>
</tr>
<tr>
<td>Kolar</td>
<td>+91-81522-43521</td>
</tr>
<tr>
<td>Koppal</td>
<td>+91-85392-25001</td>
</tr>
<tr>
<td>Kodagu</td>
<td>+91-82722-20606</td>
</tr>
<tr>
<td>Bagalokot</td>
<td>+91-83542-36240</td>
</tr>
<tr>
<td>Bellari</td>
<td>+91-83922-77100/82778-88866 (WhatsApp)</td>
</tr>
<tr>
<td>Belagavi</td>
<td>+91-83124-07290/24284</td>
</tr>
<tr>
<td>Mandya</td>
<td>+91-82322-924655</td>
</tr>
<tr>
<td>Dakshina Kannada</td>
<td>+91-82424-42590</td>
</tr>
<tr>
<td>Mysuru</td>
<td>+91-82124-23800</td>
</tr>
<tr>
<td>Raichuru</td>
<td>+91-85322-28559/26383/26020</td>
</tr>
<tr>
<td>Ramanagara</td>
<td>+91-82775-17672/ +91-80-2727-1195/ 6615</td>
</tr>
<tr>
<td>Shivamogga</td>
<td>+91-81822-21010</td>
</tr>
</tbody>
</table>
COVID Response in Bangalore

If you are COVID positive:

- Bed Allocation Information
  - Dial 108 for ambulance to shift patients
  - Dial 1912 if any hospital denies bed

- Details of BBMP Health Officers (HO)
  - In cases of emergency you may call them.
  - The ambulances for shifting Covid+ are with them.
  - The testing of primary contacts is also assigned to them. For asymptomatic primary contacts testing is done after 12 days. For symptomatic patients it is done immediately at the fever clinic.

  1. East Dr. Siddappa 9480684214
  2. West - Dr. Hegde 9480683928
  3. South - Dr. Shivakumar 9480973395
  4. R.R. Nagar - Dr. Balasundar 9480685435 -
  5. Dasarahalli - Dr. Balasundar 9480685435
  6. Bommanahalli - Dr. Suresh 9480683473
  7. Yelahanka - Dr. Savitha 9480684570 .
  8. Mahadevapura - Dr. Surendra 9801750539

- For further COVID-19 Information and Government guidelines -
22. NEWER SPECULATIONS, HYPOTHESIS AND UPDATES REGARDING COVID-19

1) MMR –
   - Lot of speculations and studies about protection of serious COVID-19 by MMR
   - SARS-CoV-2 spike glycoproteins are Class I viral membrane fusion proteins, that share structural similarities with the fusion proteins from both Measles and Mumps viruses
   - The Macro domain of SARS-CoV-2 and Rubella virus share 29% amino acid sequence identity
   - The extensive pediatric vaccination with MMR vaccine, followed globally, could have resulted in innate immune response, eg: Induction of interferons and activated natural killer cells, thereby offering natural immunity against SARS-CoV-2 in young population
   - Commonalities between the MMR viruses and SARS-CoV-2 in terms of transmission and primary replication in the upper respiratory tract and possibility of cross-protective innate immunity offered by vaccination have promoted many studies to suggest repurposing MMR vaccination for both prophylaxis and preventing the transmission of less severe to life threatening complication of COVID-19

2) Blood Group -
   - Certain studies have shown that having type ‘A’ blood group was associated with 45% increased risk of severe COVID-19. On the other hand having type ‘O’ blood group was associated with 35% reduced risk of disease
   - No other blood groups were associated with greater or lesser risk of disease. In addition, blood type did not seem to be linked to the risk of needing to be put on mechanical ventilator

3) BCG -
   - There is no evidence that BCG protects people against infection with COVID-19 virus.
   - There is experimental evidence from both animal and human studies, that the BCG vaccine has non-specific effects on the immune system.
• This effect has not been well characterized and their clinical relevance is unknown.
• In the absence of evidence, WHO does not recommend BCG vaccination for the prevention of COVID-19

4) Recent studies show that COVID-19 spreads ten meters or more by breathing (Medical Xpress July 8th 2020)

5) The clinical trials of the world’s first vaccine for COVID-19 has been completed by Sechenov First Moscow State Medical University in Russia (Financial Express July 12th July)

6) Dr. Claudio Fenizia, Immunologist at University of Milan, Italy – Study found signs of the virus in several samples of umbilical cord blood, the placenta and, in one case, breast milk. Women shouldn’t panic. This doesn’t mean there’s a viable virus in those places and “it’s too early to make guidelines” or to change care, said the study leader. But it does merit more study, especially of women who are infected earlier in their pregnancies than these women (Los Angeles Times – July 9th 2020)
The virus’ genetic material was found in one umbilical cord blood sample, two vaginal swabs and one breast milk sample. Researchers also found specific, anti-coronavirus antibodies in umbilical cord blood and in milk. In one case, “there’s strong evidence suggesting that the newborn was born already positive because we found the virus in the umbilical cord blood and in the placenta,” In another case, a newborn had antibodies to the coronavirus that do not cross the placenta, so they did not come from the mother and were “due to direct exposure of the fetus to the virus,” Fenizia said. In any case, the possibility of fetal infection seems relatively rare, he said. Only two of the newborns tested positive for the coronavirus at birth and neither became ill from it.

Dr. Ashley Roman, a pregnancy specialist at NYU Langone Health, said she and colleagues also detected viral particles on the fetal side of the placenta in several of the 11 cases they examined. The new report adds evidence that in-womb transmission is possible, but it seems rare and to not cause serious problems in the infants, she said.
7) **Vitamin D** proved to interact both with the innate immune system, by activating Toll-like receptors (TLRs) or increasing the levels of cathelicidins and β-defensins, and adaptive immune system, by reducing immunoglobulin secretion by plasma cells and pro-inflammatory cytokines production, thus modulating T cells function. Promising results have been extensively described as regards the supplementation of Vitamin D in respiratory tract infection.

8) **Coronavirus test update**: IIT Delhi develops extremely affordable COVID-19 test kit; Price range around Rs 650/- (Times of India - July 15th 2020)

9) Eurofins, the World Leader in Bio-analytical testing, Launches ViroSure-19, one of the most accurate, safest, and fastest COVID-19 testing solution in India (India Today - July 8th 2020)

10) Recent studies show that transplacental transmission is indeed possible in the last weeks of pregnancy, although we cannot exclude a possible transmission and foetal consequences earlier during the pregnancy. [(CMAJ article-probable congenital SARS-CoV-2 infection in a neonate born to woman with active SARS-CoV-2 infection), (Nature Communications article-Transplacental transmission of SARS-CoV-2 infection)]

11) A coronavirus vaccine, ChAdOx1 nCoV-19 developed by the University of Oxford appears safe and triggers an immune response. (BBC News – July 20th 2020)
23. QUICK REFERENCE CHARTS
23.1 Pregnancy & Delivery Related

Antenatal Care

General measures to minimize exposure of patients and health care providers
• Consider decreasing number of antenatal clinic visits for low-risk pregnancies
• Request patients to arrive without partner/companion

Screen for symptoms/exposure over the phone (prior to arrival to clinic)

Negative OR not feasible
Proceed with visit as scheduled

Screen positive or known COVID positive

Is visit necessary for maternal/fetal reason?
Yes
Advise on precautions (mask, hand hygiene)
• Notify team to use PPE
Defer visit by at least 14 days
• Advise patient to monitor symptoms, and indications to present to Emergency Room

No

Screen at hospital Entrance/unit

Negative
Routine precautions
• Hand hygiene
• Keep 2m distance

Positive
Identify patient as screen positive
• Prioritize these patients to minimize their stay in the waiting area
• Patient to wear mask, Hand hygiene
• Team to use PPE
• Assess severity of symptoms, comorbidities and other risk factors
• Consider testing for COVID-19 if meets criteria

Routine antenatal care
-as discussed below

Mild
Advise patient to monitor symptoms, and indications to present to Emergency Room

Moderate/ severe symptoms or risk factors
Refer to triage for detailed assessment
• Notify team in triage

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
Algorithm for isolation of suspect/confirmed cases of COVID-19

Suspect COVID-19 Case

Screening at Fever Clinics

Suspect cases directly reporting to COVID dedicated facility

Mild and very mild
(Fever/ URTI)

Admit to “Suspect case” section of
COVID CARE CENTER
(hotels/lodges/hostels/ stadiums)

Test all for COVID-19

Negative

Discharge & symptomatic management

Positive

Shift to “Confirmed case” section of
COVID CARE CENTRE
Monitor health twice daily
Shift to DCHC or CDH if necessary

Moderate
(Pneumonia with no signs of severe disease)
( RR 15 to 30/minute, SpO2 90%-94%)

Admit to “Suspect case” section of
DEDICATED COVID HEALTH CENTRE

Test all for COVID-19

Negative

Shift to non-COVID hospital/block and manage according to clinical assessment.
Discharge as per clinical assessment

Positive

Shift to “Confirmed case” section of
DEDICATED COVID HEALTH CENTRE.
Monitor for clinical severity
Shift to CDH if necessary

Severe
(Respiratory rate ≥30/minute SpO2 < 90% in room air)

Admit to DEDICATED COVID HOSPITAL with ICU facility

Test all for COVID-19

Negative

Manage according to clinical assessment.
Observing all infection prevention and control practices.
Shift to non-COVID hospital/block when patient becomes stable

Positive

Patient to remain in COVID-19 ICU
Manage according to clinical assessment
Discharge as per clinical assessment

Courtesy: FOGSI article on Pregnancy with COVID-19 infection Version2 (28th April 2020)
Management of COVID-19 in pregnancy

Pregnant Women with SARS-CoV-2 exposure
History of travel within the last 14 days / Residing in clusters/containment areas
Close contact with a confirmed case of COVID-19
(<1 metre for >15 minutes, living together, direct contact with body fluids)

Clinical Examination + RT-PCR on deep nasopharyngeal and pharyngeal samples

Asymptomatic
NO Isolation Rooms

Symptomatic
Fever >38°C AND respiratory symptoms

Monitoring at Hospital
Isolated room prefer with negative pressure (IRNP)
Protective gear for visitors/ health personnel
Delivery and neonatal procedure on site

Asymptomatic

No Isolation Rooms

Monitoring at home
(Temp + respiratory symptoms)

SARS CoV-2 NEGATIVE
Isolation at home for 14 days
If Delivery:
Breast feeding as per guidelines
Mother isolated from newborn until viral shedding clears
USG Fetal surveillance
Growth + Doppler / 2 weeks

Stop monitoring

RECOVERY

SARS CoV-2 POSITIVE

SARS CoV-2 NEGATIVE

SARS CoV-2 POSITIVE

Hospitalisation at a tertiary centre
Maternal Surveillance
+ Temp, HR, BP, RR (3-4times/day)
Fetal +FHR (1 time a day)
Chest Imaging (HRCT or X-ray) if inevitable, with abdominal shield
+Fetal Maturation by steroid depending on maternal Status (24-34 weeks of gestation)
+ IV antibiotics treatment (depending local Protocol)

Isolation at home for 14 days
Clinical Self-monitoring
If Symptoms persist
RETEST (possible false negative)

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
Hydroxychloroquine, Chloroquine or Antiviral drugs not recommended
Choice of specific antiviral therapy & immunomodulatory agent is likely to change with rapidly emerging evidence

DELIVERY
Before 24 Weeks
If severe maternal illness, consider termination
After 24 weeks
On Site /IRNP
Vaginal Delivery (Induction of labour + instrumental Delivery when possible)
Delayed cord clamping
Newborn monitoring in IRNP
SARS-CoV-2 RT PCR of the newborn
Breastfeeding with due precautions and considerations

INTENSIVE CARE UNIT ADMISSION
(Quick SOFA Score)
More than 1 following Criteria:
Systolic Blood Pressure <100mm Hg
Respiratory rate >22
Glasgow Conscious score <15
Recommended – Oxygen therapy, respiratory support for treatment of hypoxemic respiratory failure, fluid therapy, antibiotics & management of shock

SEVERE FAILURE CRITERIA
(Consider caesarean delivery)
SEPTIC SHOCK
ACUTE ORGAN FAILURE
FETAL DISTRESS

The mode of delivery in a pregnant woman with suspected or confirmed COVID-19 should be guided by her obstetric assessment and her physiological stability (cardiorespiratory status & oxygenation). COVID-19 itself is not an indication for induction of labor or caesarean section

Protective Gear
Advanced PPE

If Neonate is Stable, >35wks, >1.8 kg and mother is stable, Baby can be shifted to mother side with adequate warmth and hygiene
If Neonate is unstable, <35wks, <1.8 kg or mother is not stable, Baby has to be shifted to the SNCU in a level 3 corridor in a proper sanitised transport box. And the corridor has to be sanitised after transport of the baby.
Routine Intrapartum care
Limit visitors

Identify patient as screen positive
- Patient to wear mask, hand hygiene
- Care team to use PPE
- Consider testing for COVID-19 if meets criteria
- Notify teams — OB, anesthesia, NICU, infection control
- C-section should be performed for the standard indications

Cesarean Delivery

C-section management
- Use operating room with negative pressure if possible
- Analgesia — as per routine care
- Extend PPE to cover aerosol in case of aerosol-producing procedure (e.g., intubation)

Vaginal Delivery

Intrapartum management:
- Limit visitors and staff caring for the patient
- Negative pressure isolation room
- Analgesia — as per routine care
- Close maternal monitoring — symptoms, vitals
- Continuous electronic fetal monitoring
- May require assisted second stage via instrumental if respiratory status limits pushing efforts
- Consider extending PPE for aerosol protection once maternal pushing begins.
- C-section should be performed for the standard indications

Postpartum care

Continue contact precautions in isolated/private room, PPE by team
- Monitor maternal symptoms, vitals
- Limit visitors

Points to be discussed with family (ideally before delivery):
- Counselling about care of infant & feeding options (See separate algorithm on neonatal care)

COVID-19 results becomes available

Negative
Routine postpartum and neonatal care, Limit visitors

Positive
Discussion above should be revisited

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
23.2 Neonatal Algorithms

**Delivery Room Management**

Pregnant women with Confirmed or Suspected COVID-19
Case review among care providers to decide on the site of delivery as per the existing site guidelines, preferably, dedicated OT or Labour

Ensure mother has performed hand hygiene and wears a triple layer mask before delivery

Neonatal team preparation before delivery (COVID-19 NRP guidelines):
- Assemble the neonatal COVID team
- Inform COVID on-call consultant
- Must ensure resuscitation trolley at least 2 metres away from the delivery table
- Minimum number of personnel to attend delivery
  - For low risk deliveries – 1 person trained in resuscitation
  - For high risk deliveries – at least 2 trained persons (standby person may wait in the next room)
  - The most experienced provider should perform intubation (using transparent intubation boxes) if needed, to limit aerosol generating procedure
- All must wear PPE
- Change of PPE kit: For units with a dedicated resuscitation team for all deliveries, each delivery warrants change into a fresh PPE kit with a fresh pair of double gloves. This is necessitated so that a delivered neonate does not come in contact with likely contaminated external surface of the PPE & gloves, due to a previous delivery. In case of shortage of PPE, sterile plastic gown can be worn on the PPE to avoid contamination of the PPE with blood or amniotic fluid. The plastic gown should be appropriately discarded after completion of initial resuscitation. A change of gloves SHOULD be done.

Resuscitation:
- As per COVID-19 NRP guidelines
- Aware of aerosol generating medical procedures
- Delayed cord clamping (not earlier than 1 minute) and avoid skin to skin contact (some institutions do recommend this)
- Vitamin K injection should be given to all neonates

Transport of Neonate from place of delivery to destination:
- Transport box must be thoroughly decontaminated before transport
- Neonates must be transported in closed transport box only
- If Neonate is Stable, >35wks, >1.8 kg and mother is stable, Baby can be shifted to mother side with adequate warmth and hygiene
- If Neonate is unstable, <35wks or <1.8 kg Baby has to be shifted to the NICU, in a level 3 corridor in a proper sanitised transport box. And the corridor has to be sanitised after transport of the baby……
- Any relative accompanying the neonate must wear triple layer mask

Delivery team hands over baby to NICU team
**Stable Neonate**

- **Suspected COVID 19 Mother**
  - **Care Area:** Isolation Room / If not available then to be cared in area for suspected cases with physical separation of 2 metres between beds and curtain
  - A healthy care giver to be allowed to do basic care of baby with full precautions & PPE OR
  - If healthy care giver not available, baby can stay in mother’s room with baby in bassinet at least 1 m distance and at the foot end

- **Feeding:**
  - Expressed mother’s breast milk / Pasteurised Donor milk / Formula feed by healthy care giver
  - Take verbal and written consent.
  - Multivitamin supplementation

- **Criteria:** ++
  - Viral Testing of the baby to be done within 24 hrs of birth if:
    - Mother is positive
    - Baby is symptomatic
    - Baby exposed to COVID-19 positive person (caregiver/ family member)
  - Serological testing – not recommended

- **Discharge:**
  - If mother is suspected & stable neonate – no need for Viral testing
  - **Follow up**
    - Telephonic/Telemedicine

**Confirmed COVID 19 Mother**

- **Stable Neonate**
  - If mother is willing, baby to be given to the mother. Strict hand and breast hygiene to be followed. Wear separate gown and mask while feeding.

- **Counselling:**
  - Avoid attendants,
  - Telephonic counselling to be done daily

- **Discharge:**
  - If MOTHER & NEONATE is positive but stable
    - If baby is asymptomatic, mild to moderate symptoms were present, baby should be stable and can be discharged after 10 days – **no need to repeat RT-PCR** (In some institutions, they do repeat the test)
    - **Follow up**
      - Telephonic/Telemedicine

- **Criteria:** ++
  - Early testing may lead to false positives (e.g. if the neonate's nares, nasopharynx and/or oropharynx is contaminated by SARS-CoV-2 RNA in maternal fluids) or false negatives (e.g. RNA may not yet be detectable immediately after exposure following delivery

- **Follow up**
  - Telephonic/Telemedicine

**Omega:** If baby has contact with COVID-19 positive person other than mother (healthcare worker, any family member), then baby needs to be tested after 5 days of contact

**Criteria:** ++

- Home quarantine look for government order

- Home/ institutional quarantine (if home quarantine criteria not met)**

- If mother does not want to take discharge & baby is roomed-in, some institutions do the 2nd test for baby after 5-14 days, due to possibility of exposure from the mother/caregivers/ ward

- If first test within 24 hours is negative, no need to do repeat test, rooming-in along with stable mother

- Discharge by 48-72 hrs to healthy caregiver.

- Follow up
  - Telephonic/Telemedicine
Management of Sick Neonate of Suspected/ Confirmed COVID-19 Mother

- **Suspected/ Confirmed COVID 19 Mother**
  - **Sick Neonate**
    - (PT/RDS/MAS/HIE/Surgical neonate)

**Care Area:**
- **Isolation Room in Intensive Care Unit**
- OR
- If not available, then separate area in ICU with physical separation of 2 m between the beds and partition

**Cared in Incubator;**
- If Open care system, then cover with cling wrap

**Feeding:**
- Expressed mother’s breast milk/ Pasteurised Donor milk / Formula feed
- Take verbal and written consent.
- Multivitamin supplementation

**Viral Testing**
- First test within 24 hours of birth
- If first test is negative a repeat test should be done 5-14 days after birth/ exposure.
- **However, the test should be done immediately** if new symptoms (RD, lethargy, seizures, apnea, refusal to feed, diarrhea appear)
- Serological testing – not recommended

**Specific anti-COVID-19 treatment is not recommended in symptomatic neonates, like**
- 4) Systemic corticosteroids
- 5) IVIG
- 6) Convalescent plasma

**Respiratory Support**
- Bubble CPAP or NIPPV (if needed) with head covered with headbox to prevent environmental contamination
- Invasive Ventilation: traditional
  - Negative pressure room
  - HEPA filters if available
  - Use of aerosol box if available
- Closed ET suction
  - CPAP preferred over HFNC & NIPPV
- Appropriate PPE for doctors & nurses

**Stepdown:**
- If baby becomes asymptomatic / mild-moderate symptoms (need oxygen <3 days only) step down to isolation room to healthy caregiver/ family member or stable mother

**Respiratory Support**
- Bubble CPAP or NIPPV (if needed) with head covered with headbox to prevent environmental contamination
- Invasive Ventilation: traditional
  - Negative pressure room
  - HEPA filters if available
  - Use of aerosol box if available
- Closed ET suction
  - CPAP preferred over HFNC & NIPPV
  - Appropriate PPE for doctors & nurses

**Counselling:**
- Avoid attendants, Telephonic counselling to be done daily

**Discharge:**
- **In severe symptomatic** baby, once baby is stable, keep the baby in isolation (with mother/caregiver/ward), Do RT-PCR & can be discharged if a single negative RT-PCR
- **If baby is asymptomatic,** mild to moderate symptoms were present, baby should be stable and can be discharged after 10 days no need to repeat RT-PCR (In some institutions, they do repeat the test)

**Follow up:**
- Telephonic/Telemedicine/SOS in OPD

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# Isolation in Postnatal ward (for COVID-19 Suspected/Confirmed mother)

**IRRESPECTIVE OF COVID-19 STATUS, DISCHARGE CRITERIA**

<table>
<thead>
<tr>
<th>For neonates &gt; 2.0 Kg</th>
<th>For neonates &lt; 2.0Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mother is confident in taking care of the baby</td>
<td>1. Mother is confident in taking care of the baby</td>
</tr>
<tr>
<td>2. Mother is able trained well in feeding the neonate and is able to give direct breast feeds and spoon feeds of expressed breast milk if necessary</td>
<td>2. Mother is trained well in feeding the neonate and is able to give direct breast feeds and paladai feeds of expressed breast milk</td>
</tr>
<tr>
<td>3. Neonate is stable, is feeding well, able to maintain normal temperature in room air</td>
<td>3. Consistent weight gain is noted especially in VLBW neonates</td>
</tr>
<tr>
<td>4. No significant jaundice</td>
<td>4. Neonate is stable, is feeding well, able to maintain normal temperature at room temperature with proper clothing.</td>
</tr>
<tr>
<td>5. Birth vaccination given (BCG, OPV-zero dose, Hepatitis B)</td>
<td>5. Able to maintain normal temperature at room temperature with proper clothing.</td>
</tr>
<tr>
<td>6. Proper discharge counselling has been given to the parents {Immunization schedule, follow up visit (2 weeks of age, or earlier, if the baby becomes sick), danger signs etc.}</td>
<td>6. No significant jaundice</td>
</tr>
<tr>
<td>7. KMC is being practised</td>
<td>7. KMC is being practised</td>
</tr>
<tr>
<td>8. Proper discharge counselling has been given to the parents {ROP screen, immunisation schedule, follow up visit (2 weeks of age, or earlier, if the baby becomes sick), danger signs etc.}</td>
<td>8. Proper discharge counselling has been given to the parents {ROP screen, immunisation schedule, follow up visit (2 weeks of age, or earlier, if the baby becomes sick), danger signs etc.}</td>
</tr>
</tbody>
</table>

**Isolation in Postnatal ward (for COVID-19 Suspected/Confirmed mother)**

- **Any signs & symptoms noted in the baby, requiring NICU Care**
  - Mother swab awaited
    - Shift to Isolation NICU
      - Send relevant investigations and manage accordingly
  - Mother swab negative
    - Shift baby to OUTBORN NICU and manage accordingly.
      - Avoid attendants, Telephonic counselling to be done, discharge from outborn NICU directly once stable.
Symptomatic outborn baby requiring NICU admission

- From Hotspot/containment zone
- Postnatal exposure to COVID infected Mother other COVID positive case
- Presenting with respiratory distress with without fever and cough, onset beyond 48-72h of age and no alternative explanation for the illness

Admit and Stabilise in Isolation NICU

Managed by Isolation PG

Send attenders to Screening OPD

If attenders are to be quarantined

Baby to be kept in Isolation NICU

FOLLOW TESTING PROTOCOL FOR THE BABY

Follow Testing Protocol for Baby

POSITIVE

NEGATIVE

Manage Accordingly

Shift baby to OUTBORN NICU and manage accordingly.
Avoid attendants, Telephonic counselling to be done, discharge from outborn NICU directly once stable.

Throat swab should be taken in the following cases:
- Death of a symptomatic neonate in isolation NICU born to COVID-19 positive mother
- Brought dead neonate born to a suspected/confirmed COVID-19 mother
- Neonate who is born to a suspected or confirmed COVID-19 positive mother,
- Symptomatic neonate who came to emergency ward whose mother is having symptoms of COVID-19 (send for COVID test of mother & father also)

WORK ENVIRONMENT IN ICU/ISOLATION FOR STAFF

The Doctors, nursing and other support staff working in these isolation rooms should be separate from the ones who are working in regular NICU/SNCU. The staff should be provided with adequate supplies of PPE. The staff also needs to be trained for safe use and disposal of PPE.
Algorithm for COVID-19 testing using rapid antigen point-of-care test according to ICMR guidelines

Rapid Antigen Test kit ▲

Available

Not available

Rapid Antigen Test done

Positive

Negative

Asymptomatic

Symptomatic

To be reported as ‘positive’
(RT-PCR test not required)

To be reported as ‘negative’
(RT-PCR test not required)

Collect fresh nasopharyngeal swab and throat swab in VTM° tube

Result urgently needed*

TrueNAT or CBNAAT available (Gene Xpert)

TrueNAT or CBNAAT NOT available

RT-PCR (Approx. cost 4500-5000)

Positive

Negative

To be reported as ‘Positive’

To be reported as ‘Negative’

RT-PCR (Throat swab)
If positive, Cycle threshold (Ct) have to be compulsorily given in report according to new ICMR rules (14th July 2020)
Ct value is the number of cycles required to detect the viral antigen. Lower the value (more viral load) higher the risk

Ct values:
- Value between 17 to 24 – high viral load
- Value between 24 to 31 – moderate viral load
Above both have to be admitted in hospital immediately
- Value above 31 – low viral load -> can be treated under home quarantine under constant observation

Result not Urgent

Death, Severe Acute Respiratory Illness (SARI), Healthcare worker (HCW) after high risk exposure

“Viral Transport Medium
CBNAAT – Cartridge Based Nucleic Acid Amplification Test

°Viral Transport Medium

Courtesy:

Prepared by: NNF Karnataka State Chapter in collaboration with UNICEF, HFO
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Render My Service for #FightAgainstCorona

I resolve, that I shall render my service to the nation when called upon to do so. I shall abide by all Government directions relating to Lockdown, Quarantine, Isolation or any other instructions and advisories for protecting my nation and my fellow citizens & strengthen the #FightAgainstCorona. I shall act responsibly in fulfilling my duty and inspire others also to do so.

#ItsMyDuty

June, 22 2020

Shubham Yedav
Signature
GUIDELINES
DURING COVID-19 PANDEMIC
FOR PREGNANT WOMEN
& NEWBORN CARE

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[Logos and emblems]