Dear IAP members,

Greetings from IAP.

In the last few weeks, we have witnessed an unprecedented spread of the COVID19 worldwide. The past few months has seen a lot of findings and learnings regarding the Novel Coronavirus illness, but there are still many things which needs more research. There are a number of queries which arise in our minds and we should keep ourselves constantly updated with the latest knowledge of this evolving science.

We had conceptualized and released the 1st edition of IAP COVID19 bulletin on 21st March 2020. Now we are pleased to present the 2nd edition of IAP COVID19 bulletin with the latest updates incorporated. We take this opportunity to thank all the contributors and experts for their valuable time and dedicated service. A special word of thanks to Dr. Digant D. Shastri, Senior Consultant Pediatrician and ID Expert for coordinating, editing and making this bulletin ready for all of us in such a short time.

We are sure that you all would find the information provided in this bulletin as utmost useful.

Stay safe!

Jai Hind! Jai IAP!

Kind regards,

Dr. Bakul Jayant Parekh
National President, IAP 2020

Dr. G. V. Basavaraj
Hon. Sec. Gen., IAP 2020-21

Dear Readers,

At the outset I thank president CIAP Dr. Bakul Parekh and Hon. Secretary General Dr. G V Basavraj for entrusting me to prepare the IAP COVID 19 second bulletin.

Novel Corona Virus infection is associated with lot many mysteries and abundant material (evidence bases/ experience based/ observation based / hypothetical) is in circulation. At times it confuses the members what to believe and what not to believe. The government directives and recommendations are dynamic process and it changes periodically. In view of all these, there is a pressing need to have 2nd edition of IAP COVID 19 bulletin with updated evidence based information.

Experts from Indian Academy of Paediatrics have shared the most updated information. I thank them for it. Big thanks to Dr. Vijay Yewale, Dr. Piyush Gupta, Dr. Jaydeep Chaudhary, Dr. Tanu Singhal and Dr. Dhanya Dharmapalan for reviewing the manuscript.

Update your knowledge and be more confident in the current pandemic situation.

Stay Safe

Dr. Digant D Shastri
Coordinator and Editor, IAP COVID 19 second bulletin
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Testing Protocol

Strategy for COVID19 testing in India (Version 4, dated 09/04/2020)

RT-PCR testing of upper respiratory tract swabs (Naso pharyngeal and Oropharyngeal swabs) for detection of SARS-CoV-2 nucleic acid has been recommended as the confirmatory test for COVID-19. Other alternative samples for RT-PCR include bronchoalveolar lavage or endotracheal aspirate.

The Government of India has now advised the use of antibody tests in patients with symptomatic influenza-like illness (ILI) in 25 districts across the country, or ‘COVID hotspots’. Based on the results of the antibody test, confirmatory RT-PCR and clinical assessment, hospital treatment or home isolation measures are instituted, with contact tracing measures as per protocol.

Following patients should be tested for Covid-19:
1. All symptomatic* individuals with history of travel to OR residence in a country/area/territory reporting local transmission of COVID 19 in the last 14 days.
2. All symptomatic contacts of laboratory confirmed cases
3. All asymptomatic healthcare personnel (HCP)
4. All patients with SARI (severe acute respiratory illness – fever AND cough and/or shortness of breath)
5. Asymptomatic direct and high-risk contacts# of a confirmed case (should be tested once between day 5 and day 14 after contact)

In hotspots/cluster (as per MoHFW) and in large migration gatherings/evacuees centres
6. All symptomatic ILI (fever, cough, sore throat, runny nose)
   a) Within 7 days of illness – rRT-PCR
   b) After 7 days of illness – Antibody test (If negative, confirmed by rRT-PCR)

*Symptomatic refers to fever/cough/shortness of breath.
#Direct and high-risk contacts include those who live in the same household with a confirmed case and HCP who examined a confirmed case.

- Contact: A contact is a person that is involved in any of the following:

  1. Providing direct care without proper personal protective equipment (PPE) for COVID-19 patients.
  2. Staying in the same close environment of a COVID-19 patient (including workplace, classroom, household, gatherings).
  3. Traveling together in close proximity (1 m) with a symptomatic person who later tested positive for COVID-19.
**High Risk Contact:**

1. Touched body fluids of the patient (Respiratory tract secretions, blood, vomit, saliva, urine, faeces)
2. Had direct physical contact with the body of the patient including physical examination without PPE.
3. Touched or cleaned the linens, clothes, or dishes of the patient.
4. Lives in the same household as the patient.
5. Anyone in close proximity (within 3 ft) of the confirmed case without precautions.
6. Passenger in close proximity (within 3 ft) of a conveyance with a symptomatic person who later tested positive for COVID-19 for more than 6 hours.

**Low Risk Contact:**

1. Shared the same space (Same class for school/worked in same room/similar and not having a high risk exposure to confirmed or suspect case of COVID-19).
2. Travelled in same environment (bus/train/flight/any mode of transit) but not having a high-risk exposure.

For initial diagnostic testing for COVID-19, it is recommended collecting and testing an upper respiratory specimen. Nasopharyngeal specimen is the preferred choice for swab-based SARS-CoV-2 testing. When collection of a nasopharyngeal swab is not possible, the following are acceptable alternatives:

- An oropharyngeal (OP) specimen collected by a healthcare professional,
- A nasal mid-turbinate (NMT) swab (using a flocked tapered swab)
- An anterior nares specimen (using a round foam swab).

If available the lower respiratory tract specimens also should be tested. For patients who develop a productive cough, sputum should be collected and tested for SARS-CoV-2. The induction of sputum is not recommended. When it is clinically indicated (e.g., those receiving invasive mechanical ventilation), a lower respiratory tract aspirate or bronchoalveolar lavage sample should be collected and tested as a lower respiratory tract specimen.

Specimens should be collected as soon as possible once a decision has been made to pursue COVID-19 testing, regardless of the time of symptom onset.

**Nasopharyngeal swab (NP)/oropharyngeal swab (OP)**

Use only synthetic fiber 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. Place swabs immediately into sterile tubes containing 2-3 ml of viral transport
media. If both swabs are used, NP and OP specimens should be combined at collection into a single vial.

*Nasopharyngeal swab:* 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. *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.

**Bronchoalveolar lavage, tracheal aspirate**

Collect 2-3 mL into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container.

**Sputum**

Have the patient rinse the mouth with water and then expectorate deep cough sputum directly into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container.

**Storage:** Store specimens at 2-8°C for up to 72 hours after collection. If a delay in testing or shipping is expected, store specimens at -70°C or below.

**Rapid antibody based blood test for COVID-19** (ICMR advisory 4 April 2020)

**Strategy for areas reporting clusters (containment zone) and in large migration**

At facility level, symptomatic ILI individuals to be tested using rapid antibody tests.

A. **Antibody test negative:**

   ▪ If warranted, confirm by real-time RT-PCR using throat/nasal swab.

   ▪ RT-PCR negative: Likely non-COVID-19 ILI
   ▪ RT-PCR positive: *Confirmed COVID-19 Case* and action as per protocol to be initiated for isolation, treatment and contact tracing. OR

   ▪ If real-time RT-PCR not done, home quarantine and repeat antibody testing after 10 days of the last rapid antibody test.

   ▪ Antibody test negative: Likely non-COVID-19 ILI.
   ▪ Antibody test positive: there is possibility of recent infection, quarantine for another 10 days.
B. **Antibody test positive**: After clinical assessment, treatment in hospital or isolation as per protocol. Action as per protocol to be initiated for contact tracing.

*If symptoms worsen, refer to designated COVID-19 hospitals. When home quarantine is not feasible, consider facility-based quarantine.*
General Guidelines:

- Healthcare workers doing the rapid antibody test to use gloves, mask, and head covers.
- Healthcare workers collecting throat/nasal swab to follow standard national infection control guidelines.
- The rapid antibody tests approved by US-FDA/CE-IVD or non-CE-IVD validated by ICMR-NIV with marketing approval by DCGI be used.
- In order to ensure that all such cases are monitored and necessary action is initiated with respect to infectious disease management, details of all test results shall be uploaded in ICMR port.
  - All such organizations are duty bound to register themselves to ICMR portal and upload the data in real-time.

Compiled on 14 April 2020 and all the documents were accessed on 12 April 2020.
Respiratory Sample Collection from Suspected COVID 19 Cases
(As per recent guidelines issued by ICMR and MoHFW)

General guidelines:

Health care providers should contact their local/state health department immediately to notify them of patients who meet the updated / recent case definition for COVID 19 as given by the health authorities, Government of India available on the website www.mohfw.gov.in

Complete the standard requisition form for each specimen submitted. Ensure restricted entry of visitors or attendants during sample collection.

Appropriate clinical sample should be collected by laboratory personnel/ health care worker trained in specimen collection following all biosafety and biosecurity precautions and using personal protective equipment (PPEs) with latex free purple nitrile gloves while collecting the sample from the patient.

Ensure proper disposal of all waste generated (yellow bin)

Clinical samples need to be sent to the Govt of India designated laboratory ensuring standard triple packaging for transportation.

Combined throat (ie oropharyngeal swab) and nasal swab should be sent for patients who are not on mechanical ventilator (alternatively nasopharyngeal swab may be sent). For mechanically ventilated patients, lower respiratory tract aspirate (BAL) is the preferred sample.

Sample collection technique

Upper respiratory tract

Oropharyngeal swab (e.g. throat swab): Tilt patient’s head back 70 degrees. Rub swab over both tonsillar pillars and posterior oropharynx and avoid touching the tongue, teeth, and gums. Use only synthetic fibre swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden shafts. Place swabs immediately into sterile tubes containing 2-3 ml of viral transport media.

Nasopharyngeal swab: Tilt patient’s head back 70 degrees. Insert flexible swab through the nares parallel to the palate (not upwards) until resistance is encountered or the distance is equivalent to that from the ear to the nostril of the patient. Gently, rub and roll the swab. Leave the swab in place for several seconds to absorb secretions. Slowly remove swab while rotating it.

The nasopharyngeal and oropharyngeal swabs should be placed in the same tube to increase the viral load.
Combined nasal & throat swab: Tilt patient’s head back 70 degrees. While gently rotating the swab, insert swab less than one inch into nostril until resistance is met at turbinates. Rotate the swab several times against nasal wall and repeat in other nostril using the same swab. Place tip of the swab into sterile viral transport media tube and cut off the applicator stick. For throat swab, take a second dry polyester swab, insert into mouth, and swab both tonsillar pillars & the posterior pharynx. Avoid touching tongue, teeth and gums. Place tip of swab into the same tube and cut off the applicator tip. Separate swabs for throat and nose should be taken, but same viral transport medium tube be used to increase the viral load.

**Lower respiratory tract**

Collect 2-3 mL of Bronchoalveolar lavage, tracheal aspirate or sputum into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container which has to be mixed with the viral transport medium and transported on ice.

**Packaging:** Sample should be collected in a proper container that should be sealed and made leak-proof using parafilm and absorbent material. It must be appropriately labelled and secured in a zip-lock pouch with absorbent material such as tissue paper. The zip-lock container should further be placed in sturdy plastic container and its neck should be sealed. Disinfect the zip-lock pouch and secondary container by wiping with surface disinfectant and pack it further in ‘bio hazard labeled thermocol box/hard card board box’ with hard frozen gel packs. Properly seal the box and secure ziplock pouch with test requisition form on the outer surface of the container. Label the box as shown in figure below and transport to the designated laboratory.

Test Requisition Form should be sent attached with specimen box as explained above or a scanned copy through e-mail (if such arrangement is done with the laboratory) so as to minimize the risk of transmission through fomites.

**Storage:** Store specimens at 2-8°C for up to 72 hours after collection. If a delay in testing or shipping is expected, store specimens at -80°C.
# Specimen Collection, Packaging and Transport Guidelines for 2019 novel Coronavirus (2019-nCoV)

## Requirements for Clinical Samples Collection, Packaging and Transport

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<td>1. Sample vials and Virus Transport Medium (VTM)</td>
<td>2. Adsorbent material (cotton, tissue paper, paraffin, seizer, cello tape)</td>
<td>3. A leak-proof secondary container (e.g., ziplock pouch, cryobox, 50 mL centrifuge tube, plastic container)</td>
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<td>4. Hard-frozen Gel Packs</td>
<td>5. A suitable outer container (e.g., thermocol box, ice-box, hard-board box) (minimum dimensions: 10 x 10 x 10 cm)</td>
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## Procedure for Specimen Packaging and Transport

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<td>1. Use PPE while handling specimen</td>
<td>2. Seal the neck of the sample vials using parafilm</td>
<td>3. Cover the sample vials using absorbent material</td>
<td>4. Arrange primary container (vial) in secondary container</td>
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<tr>
<td>5. Placing the centrifuge tube inside a zip-lock pouch</td>
<td>6. Placing the zip-lock pouch inside a sturdy plastic container and seal the neck of the container</td>
<td><strong>Note:</strong> Sample vials can also be placed inside a zip-lock pouch, covered in absorbent material and secured by heat-sealing or rubber bands. Then, the zip-lock pouch should be placed inside another plastic pouch and secured</td>
<td>7. Using a thermocol box as an outer container and placing the secondary container within it, surrounded by hard-frozen gel packs</td>
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| 7. Using a hard card-board box as an outer container and placing the secondary container and the gel packs | 8. Placing the completed Specimen Referral Form (available on www.niv.co.in) and request letter inside a leak-proof, zip-lock pouch | 9. Securing the zip-lock pouch with the Specimen Referral Form on the outer container | 10. Attaching the labels:  
  - Senders’ address, contact number; Consignee’s address/contact number;  
  - Biological substance Category B;  
  - ‘UN 3373’, Orientation label, Handle with care |
| ![Image](image15.png) | ![Image](image16.png) | ![Image](image17.png) | ![Image](image18.png) |
Management of COVID-19 positive paediatric patient

Asymptomatic / Mild Symptomatic Children

Few cases of COVID-19 caused by SARS-CoV-2 infection have been reported in children compared with the total number of cases in the general population. The majority of SARS cases in children younger than 18 were thought to have occurred through household transmission, though some cases were hospital-acquired. Data from pediatric cases of COVID-19 show milder symptoms among children compared with adults. Co-detection of other respiratory pathogens (influenza, respiratory syncytial virus, Mycoplasma pneumoniae) has been described in children with COVID-19. Among various studies across world, deaths occurred among children with critical illness and the overall case fatality rate was 2.3%. The case fatality rate among children with critical disease was 49%. Among children in China, illness severity was lower with 94% having asymptomatic, mild or moderate disease, 5% having severe disease, and <1% having critical disease. Very few cases of death have been reported in children in present pandemic of COVID-19.

CLINICAL COURSE

The incubation period for COVID-19 is thought to extend to 14 days, with a median time of 4-5 days from exposure to symptoms onset. The signs and symptoms of COVID-19 present at illness onset vary, but over the course of the disease, most children with COVID-19 will experience the following:

- Fever
- Cough
- Fatigue
- Anorexia
- Shortness of breath
- Sputum production
- Myalgia

Atypical presentation is seen in children with medical comorbidities and may have delayed presentation of fever and respiratory symptoms. Headache, confusion, rhinorrhea, sore throat, hemoptysis, vomiting, and diarrhea have been reported but are less common (<10%). Some persons with COVID-19 have experienced gastrointestinal symptoms such as diarrhea and nausea prior to developing fever and lower respiratory tract features.

Illness Severity

- Mild to moderate (mild symptoms up to mild pneumonia): 81%
- Severe (dyspnea, hypoxia, or >50% lung involvement on imaging): 14%
- Critical (respiratory failure, shock, or multiorgan system dysfunction): 5%
Children with no reported underlying medical conditions had lower case fatality rate, but case fatality was higher for children with comorbidities like cardiovascular disease, chronic respiratory disease, chronic kidney disease, immunocompromised states, etc. Among children who developed severe disease, the medium time to develop dyspnea ranged from 5 to 8 days, the median time to acute respiratory distress syndrome (ARDS) ranged from 8 to 12 days, and the median time to ICU admission ranged from 10 to 12 days. Clinicians should be aware of the potential for some children to rapidly deteriorate within one week after the onset of illness. The median length of hospitalization among survivors was 10 to 13 days.

Children may play a role in the spread of SARS-CoV-2 in the community as viral RNA was detected in respiratory specimens up to 22 days after symptoms began and in stool up to 30 days after symptoms began according to some studies. Although transmission of SARS-CoV-2 from asymptomatic or pre-symptomatic persons has been reported, risk of transmission is thought to be greatest when children are symptomatic. Viral RNA shedding, measured indirectly by RT-PCR cycle threshold values, is greatest at the time of symptom onset and declines over the course of several days to weeks.

Clinical recovery has been correlated with the detection of IgM and IgG antibodies which signal the development of immunity. However, overall control of pandemic depends of development of herd immunity either by infection or mass immunization(under research process). There are no data concerning the possibility of re infection with SARS-CoV-2 after recovery from COVID-19.

**BASIC WORKUP**

Detailed history of onset of symptoms and progression in a chronology has to be obtained. History and medical documents should be obtained in order to classify the COVID-19 positive children in to high risk and no risk group.

**Diagnostic Testing**

Diagnosis of COVID-19 requires detection of SARS-CoV-2 RNA by reverse transcription polymerase chain reaction (RT-PCR). Detection of SARS-CoV-2 viral RNA is better in nasopharynx samples compared to throat samples. Lower respiratory samples may have better yield than upper respiratory samples. SARS-CoV-2 RNA has also been detected in stool and blood. Detection of SARS-CoV-2 RNA in blood may be a marker of severe illness. Infection with both SARS-CoV-2 and other respiratory viruses has been reported, and detection of another respiratory pathogen does not rule out COVID-19

**Laboratory Investigations**

- Base line investigations : CBC ,CRP, ESR, S. Ferritin ,Procalcitonin ,SGPT, SGOT, Creatinine phosphokinase, LDH ,Blood culture D-dimer , Random blood glucose

- In severe cases : Coagulation function, Baseline ECG, Myocardial enzyme spectrum, Blood gas analysis, Serum electrolytes.

Lymphopenia is the most common lab finding in COVID-19 and is found in as many as 83% of hospitalized children. Lymphopenia, neutrophilia, elevated serum alanine aminotransferase and aspartate aminotransferase levels, elevated lactate dehydrogenase, high
CRP, and high ferritin levels may be associated with greater illness severity. Elevated D-dimer and lymphopenia have been associated with greater morbidity and mortality. Procalcitonin is typically normal on admission, but may increase among those admitted to the ICU. Children with critical illness has high plasma levels of inflammatory makers, suggesting potential immune dysregulation.

**Radiographic Findings**

Chest X-rays of children with COVID-19 show patchy infiltrates consistent with viral pneumonia. Chest radiographs typically demonstrate bilateral air-space consolidation, though children may have unremarkable chest radiographs early in the disease.

Chest CT images from children with COVID-19 typically demonstrate bilateral, peripheral nodular ground glass opacities. Because this chest CT imaging pattern is non-specific and overlaps with other infections, the diagnostic value of chest CT imaging for COVID-19 may be low and dependent upon interpretations from individual radiologists. Given the variability in chest imaging findings, chest radiograph or CT alone is not recommended for the diagnosis of COVID-19.

**MANAGEMENT**

COVID-19 positive children may be asymptomatic or may develop mild illness. Mild illness includes uncomplicated upper respiratory tract viral infection symptoms such as fever, fatigue, cough (with or without sputum production), anorexia, malaise, muscle pain, sore throat, dyspnea, nasal congestion, or headache. Rarely, children may also present with diarrhea, nausea, and vomiting.

WHO recommends that all laboratory confirmed cases be isolated and cared for in a health care facility. The decision to monitor a patient in the inpatient or outpatient setting should be made on a case-by-case basis. This decision will depend on the clinical presentation, requirement for supportive care, potential risk factors for severe disease, and the ability of the parents to isolate the children at home. Children with risk factors for severe illness should be monitored closely given the possible risk of progression to severe illness in the second week after symptom onset.

Children with a mild clinical presentation (absence of viral pneumonia and hypoxia) may not initially require hospitalization, and will be able to manage the illness at home. Asymptomatic or mild symptomatic COVID children can be isolated and managed either in hospital or in non-traditional facilities, such as repurposed hotels, stadiums or gymnasiums with adequate basic health facilities and medical staff, where they can remain until their symptoms resolve and laboratory tests for COVID-19 virus are negative.

**TREATMENT:**

- Lymphocyte count > 1100/uL2, Neutrophilia/ Lymphocyte ratio <3, no thrombocytopenia,
- Normal d-dimer,
- CRP < 60mg/L,
- Normal CXR
- Bed rest
- Supportive care
- Adequate calorie(Nutrition) and water intake
- Antipyretics – Paracetamol – 10-15mg/kg/dose

HOME BASED CARE

Home based care can be considered, as long as they can be followed up and cared for by family members. This decision requires careful clinical judgment and should be informed by an assessment of the safety of the patient’s home environment. In cases in which care is to be provided at home, if and where feasible, a trained HCW should conduct an assessment to verify whether the residential setting is suitable for providing care; the HCW must assess whether the patient and the family are capable of adhering to the precautions that will be recommended as part of home care isolation (e.g., hand hygiene, respiratory hygiene, environmental cleaning, limitations on movement around or from the house).

Children and household members should be educated about personal hygiene, basic IPC measures, and how to care as safely as possible for the children having COVID-19 to prevent the infection from spreading to household contacts. Counsel parents about signs and symptoms of worsening or serious COVID-19 in children. If they develop any of these symptoms, they should seek urgent care through feasible designated health facility.

Although most children with mild disease may not have indications for hospitalization, it is necessary to implement appropriate IPC to contain and mitigate transmission. Household members should adhere to the following recommendations.

- Place the patient in a well-ventilated single room (i.e. With open windows and an open door).
- Limit the movement of the patient in the house and minimize shared space. Ensure that shared spaces (e.g. Kitchen, bathroom) are well ventilated (keep windows open).
- Household members should stay in a different room or, if that is not possible, maintain a distance of at least 1 meter from the ill person (e.g. sleep in a separate bed).
- Limit the number of caregivers. Ideally, assign one person who is in good health and has no underlying chronic or immunocompromising conditions.
- Visitors should not be allowed until the patient has completely recovered and has no signs or symptoms of COVID-19.
- Perform hand hygiene after any type of contact with children or their immediate environment. Hand hygiene should also be performed before and after preparing food, before eating, after using the toilet, and whenever hands look dirty. If hands are not visibly dirty, an alcohol-based hand rub can be used. For visibly dirty hands, use soap and water.
- When washing hands with soap and water, it is preferable to use disposable paper towels to dry hands. If these are not available, use clean cloth towels and replace them frequently.
- To contain respiratory secretions, a medical mask should be provided to the patient and worn as much as possible, and changed daily. Individuals who cannot tolerate a medical mask should use rigorous respiratory hygiene; that is, the mouth and nose.
should be covered with a disposable paper tissue when coughing or sneezing. Materials used to cover the mouth and nose should be discarded or cleaned appropriately after use (e.g. wash handkerchiefs using regular soap or detergent and water).

- Caregivers should wear a medical mask that covers their mouth and nose when in the same room as the patient. Masks should not be touched or handled during use. If the mask gets wet or dirty from secretions, it must be replaced immediately with a new clean, dry mask.
- Remove the mask using the appropriate technique – that is, do not touch the front, but instead untie it. Discard the mask immediately after use and perform hand hygiene.
- Avoid direct contact with body fluids, particularly oral or respiratory secretions, and stool. Use disposable gloves and a mask when providing oral or respiratory care and when handling stool, urine, and other waste. Perform hand hygiene before and after removing gloves and the mask.
- Do not reuse masks or gloves.
- Use dedicated linen and eating utensils for the patient; these items should be cleaned with soap and water after use and may be re-used instead of being discarded.
- Daily clean and disinfect surfaces that are frequently touched in the room where the patient is being cared for, such as bedside tables, bed frames, and other bedroom furniture. Regular household soap or detergent should be used first for cleaning, and then, after rinsing, regular household disinfectant containing 0.1% sodium hypochlorite (i.e. equivalent to 1000 ppm) should be applied.
- Clean and disinfect bathroom and toilet surfaces at least once daily. Regular household soap or detergent should be used first for cleaning, and then, after rinsing, regular household disinfectant containing 0.1% sodium hypochlorite should be applied.
- Clean the patient’s clothes, bed linen, and bath and hand towels using regular laundry soap and water or machine wash at 60–90 °C (140–194 °F) with common household detergent, and dry thoroughly. Place contaminated linen into a laundry bag. Do not shake soiled laundry and avoid contaminated materials coming into contact with skin and clothes.
- Gloves and protective clothing (e.g. plastic aprons) should be used when cleaning surfaces or handling clothing or linen soiled with body fluids. Depending on the context, either utility or single-use gloves can be used. After use, utility gloves should be cleaned with soap and water and decontaminated with 0.1% sodium hypochlorite solution. Single-use gloves (e.g. nitrile or latex) should be discarded after each use. Perform hand hygiene before putting on and after removing gloves.
- Gloves, masks, and other waste generated during home care should be placed into a waste bin with a lid in the patient’s room before disposing of it as infectious waste. The onus of disposal of infectious waste resides with the local sanitary authority.
- Avoid other types of exposure to contaminated items from the patient’s immediate environment (e.g. do not share toothbrushes, cigarettes, eating utensils, dishes, drinks, towels, washcloths, or bed linen).
- When HCWs provide home care, they should perform a risk assessment to select the appropriate personal protective equipment and follow the recommendations for droplet and contact precautions.
• For mild laboratory confirmed children who are cared for at home, to be released from home isolation, cases must test negative using PCR testing twice from samples collected at least 24 hours apart.
• Where testing is not possible, WHO recommends that confirmed children remain isolated for an additional two weeks after symptoms resolve.

HOSPITAL BASED CARE

• At triage give suspect patient a triple layer surgical mask and direct patient to separate area, an isolation room if available.
• Keep at least 1 meter distance between children. Instruct all children to cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others. Perform hand hygiene after contact with respiratory secretions.
• Droplet precautions prevent large droplet transmission of respiratory viruses. Use a triple layer surgical mask if working within 1-2 meters of the patient.
• Place children in single rooms, or group together those with the same etiological diagnosis.
• When providing care in close contact with a patient with respiratory symptoms (e.g. coughing or sneezing), use eye protection (facemask or goggles), because sprays of secretions may occur. Limit patient movement within the institution and ensure that children wear triple layer surgical masks when outside their rooms.
• Droplet and contact precautions prevent direct or indirect transmission from contact with contaminated surfaces or equipment (i.e. contact with contaminated oxygen tubing/interfaces). Use PPE (triple layer surgical mask, eye protection, gloves and gown) when entering room and remove PPE when leaving. If possible, use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers).
• If equipment needs to be shared among children, clean and disinfect between each patient use. Ensure that health care workers refrain from touching their eyes, nose, and mouth with potentially contaminated gloved or ungloved hands.
• Avoid contaminating environmental surfaces that are not directly related to patient care (e.g. door handles and light switches). Ensure adequate room ventilation. Avoid movement of children or transport. Perform hand hygiene.
• Ensure that healthcare workers performing aerosol-generating procedures (i.e. open suctioning of respiratory tract, intubation, bronchoscopy, cardiopulmonary resuscitation) use PPE, including gloves, long-sleeved gowns, eye protection, and fit-tested particulate respirators.
• Whenever possible, use adequately ventilated single rooms when performing aerosol-generating procedures, meaning negative pressure rooms with minimum of 12 air changes per hour or at least 160 liters/second/patient in facilities with natural ventilation. Avoid the presence of unnecessary individuals in the room.
• Symptomatic treatment, bed rest, adequate hydration and nutrition remain the cornerstone.
• A health care worker should regularly assess the child for worsening symptoms or presence of co-infection/illnesses.
• Children should be escalated to higher level health care unit in settings of clinical worsening.
CARE OF INFANTS WITH COVID-19 POSITIVE MOTHER

- Considering the benefits of breastfeeding and the insignificant role of breast milk in the transmission of other respiratory viruses, a mother can continue breastfeeding.
- Infants born to mothers with suspected, probable, or confirmed COVID-19 should be fed according to standard infant feeding guidelines, while applying necessary precautions for IPC.
- Mother should wear a medical mask when she is near her baby and perform hand hygiene before and after having close contact with the baby. She will also need to follow the other hygiene measures described in this document.
- Mothers and infants should be enabled to remain together and practice skin-to-skin contact, kangaroo mother care and to remain together and to practice rooming-in throughout the day and night, especially immediately after birth during establishment of breastfeeding, whether they or their infants have suspected, probable, or confirmed COVID-19.
- Breastfeeding counseling, basic psychosocial support, and practical feeding support should be provided to all pregnant women and mothers with infants and young children, whether they or their infants and young children have suspected or confirmed COVID-19.
- In situations when severe illness in a mother with COVID-19 or other complications prevents her from caring for her infant or prevents her from continuing direct breastfeeding, mothers should be encouraged and supported to express milk, and safely provide breast milk to the infant, while applying appropriate IPC measures.
CHILD POSITIVE FOR COVID-19 BY RTPCR

ASYMPROMATIC

MILD SYMPTOMATIC

SEVERE COVID ILLNESS

ABSENT / PRESENT

RISK FACTORS / COMORBIDITIES

ABSENT

* Home based/ Stable isolation care (Level 0/1)
* Bed rest
* Adequate nutrition and hydration
* Symptomatic treatment
* Monitoring for worsening

PRESENT

* Hospital based care (Level 2)
* Bed rest
* Adequate nutrition and hydration
* Symptomatic treatment
* Monitoring for worsening
* Management of comorbidities

ABSENT

* Home based/ Stable isolation care (Level 0/1)
* Bed rest
* Adequate nutrition and hydration
* Symptomatic treatment
* Monitoring for worsening

PICU ADMISSION

* Level 3/Level 4 care
* O2 Supplementation
* SOS Ventilation accordingly
* Hemodynamic Stabilisation
* Adequate hydration and nutrition
* Management according to Severe COVID guidelines

WORSENING OF SYMPTOMS/ APPEARANCE OF DANGER SIGNS / CO ILLNESSES/ORGAN DYSFUNCTION

MANAGEMENT APPROACH FOR THE CHILD CONFIRMED WITH COVID-19
Paediatric Intensive care management in COVID 19

1. Introduction
Children account for 1-2% of the total population affected with Coronavirus infection-19 (COVID-19) with about 2-6% of them requiring management in the intensive care unit (ICU). The disease appears to be less severe in children and various theories have been proposed for the same. Severe acute respiratory illness (SARI) including severe pneumonia and acute respiratory distress syndrome (ARDS), septic shock, myocardial dysfunction, acute kidney injury and other organ dysfunction require admission to the pediatric intensive care unit (PICU). Intensive care needs like mechanical ventilation, renal replacement therapy (RRT), extracorporeal membrane oxygenation (ECMO) and cardiopulmonary resuscitation pose a significant risk of transmission to healthcare workers (HCW) and other patients. Strict infection control practices are essential to prevent the spread through fomites, contact, droplets and aerosol.

2. Cohort ICU
Children with SARI are preferably managed in a separate area different from the ICU where other children are being taken care. In addition, suspect and confirmed cases should have separate designated areas. Negative pressure isolation rooms equipped with intensive monitoring tools are recommended. If unavailable, single rooms with exhaust fans are preferred.

3. Management of SARI
   3.1. Definition: Child presenting with cough and difficulty in breathing or tachypnea with one of the following:
      i) Hypoxemia [oxygen saturation (SpO₂) <90% or central cyanosis]
      ii) Severe chest indrawing or grunting
      iii) Danger signs like altered sensorium, poor feeding, convulsions
      as per World health Organization (WHO) definition of severe pneumonia.
   3.2. Respiratory support:
      3.2.1. Low flow oxygen delivery devices such as nasal prongs oxygen are the initial choice with a target SpO₂ of ≥ 95%. A surgical mask can be placed over the nasal prongs to minimize droplet transmission of infection in older children. In infants, an oxygen hood may be placed over the head along with nasal prongs to decrease spread of aerosols due to leaks around the cannula, especially if higher flows are used. Nebulization should be avoided. If necessary, in children with airway obstruction like asthma, metered dose inhalers (MDI) are preferred.
      3.2.2. Heated high flow nasal cannula (HHFNC/HFNC) which is a commonly used modality of respiratory support in bronchiolitis and pneumonia is avoided in COVID-19 as it is found to be associated with aerosol generation due to use of higher flows and leaks.
      3.2.3. Non-invasive ventilation (NIV) using various interfaces like nasal mask, oronasal mask, full face mask and helmets have been tried in adults with
COVID-19. However, they are associated with aerosol generation especially if adequate seal cannot be maintained. In children, finding the appropriate fit as well as maintaining adequate seal without sedation is difficult. NIV use has also shown high failure rates and delay in intubation. Use of NIV is discouraged, unless full aerosol precautions with negative pressure rooms are available.

3.2.4. **Invasive mechanical ventilation:** In case of non-improvement or worsening of respiratory failure on nasal prongs, early elective intubation is preferred to avoid the risks involved in emergency intubation. The decision to intubate may include a combination of clinical, radiological and pulse oximetry or blood gas parameters, as per availability. The procedure of intubation is high risk in view of aerosol generation and has to be performed by the most experienced team member using the technique of Rapid sequence intubation (RSI) with a few modifications from the routine (Fig 1 & Table 1). If available and trained, video-laryngoscope guided intubation is preferred. Use of a transparent plastic hood enclosure (Aerosol box) with two openings for the intubator’s hands has been tried in some units to contain the aerosol within the hood. Invasive mechanical ventilation strategies for children with COVID-19 are along the lines of management of Pediatric Acute Respiratory Distress Syndrome (PARDS) (Fig 2). ARDS is stratified using the PALICC (Pediatric Acute Lung Injury Consensus Conference) criteria for PARDS and Saturation targets of 92-95% for moderate and 88-92% for severe ARDS is followed. Closed suction catheters are preferred to avoid disconnection, aerosol production and de-recruitment. A subset of critically ill adults have shown atypical features of ARDS having lungs with low elastance, low ventilation/perfusion, low lung weight, low recruitability (Type L phenotype) versus the typical ARDS (Type H). Silent hypoxemia with minimal distress has also been reported. Extubation is also associated with high aerosol generation and should be done in controlled setting directly to nasal prongs, avoiding NIV. It should be planned once the team is sure that the child will tolerate extubation. Use of plastic bags or sealed enclosures around the face after disconnection from ventilator and ensuring minimal coughing during extubation can minimise aerosol generation.

4. **Shock:** Restricted crystalloid fluid bolus (10-20 ml/kg of 0.9% saline or balanced salt solution) has been recommended by Surviving sepsis guidelines followed by Adrenaline infusion as the first vasoactive drug in Pediatric septic shock.

5. **Myocarditis:** Diuretics, Inodilator and ECMO have been recommended. Immunomodulator like Intravenous immunoglobulin (IVIG) may be considered.

6. **Acute kidney injury:** Failure of conservative management like anuric fluid regime and trial of diuretics requires initiation of RRT like Peritoneal dialysis (PD), hemodialysis (HD) or continuous renal replacement therapy (CRRT).
7. **Acute liver failure, coagulopathy and DIC**: These are managed conservatively with blood component therapy as necessary.

8. **Cytokine release syndrome**: It is characterised by severe inflammation with hyperferritinemia, high C-reactive protein and high Interleukin-6 (IL-6) levels which is likely to respond to Tocilizumab.

9. **Supportive care**:
   9.1. **Early enteral nutrition**: Enteral nutrition should be started within 24 hours and full feeds established by 48 hours, if there are no contraindications.
   9.2. **Blood transfusion**: If stable hemodynamics and oxygenation, a hemoglobin (Hb) of >7g/dL is targeted. In case of refractory hypoxemia or unstable hemodynamics, the trigger to transfuse would be Hb <10g/dL.
   9.3. **Antibiotics**: Co-infection with other viruses and bacteria have been observed within 72 hours of ICU admission. Oseltamivir, Azithromycin, 3rd generation cephalosporin like Ceftriaxone and anti-Staphylococcal cover with Cloxacillin is necessary especially in mechanically ventilated patients. If clinical and radiological worsening appears after 48 hours, active screening and treatment for ventilator associated pneumonia (VAP) as per local culture and sensitivity patterns should be considered.

10. **Specific therapy**: Various antiviral drugs and immunomodulators have been tried in COVID-19 patients. However, there is no strong evidence to recommend the routine use of any therapy. Randomized control trials are on-going for the use of Chloroquine, Hydroxychloroquine, Azithromycin, Interferon-α, Ribavirin, Remdesivir and antiretroviral drugs namely Ritonavir-Lopinavir. Corticosteroids, IVIG and convalescent plasma are being used in a few cases.

11. **Resuscitation**: Cardiac arrest during ICU care of COVID-19 patients requiring cardiopulmonary resuscitation (CPR) pose a high risk of aerosol generation. Two persons for alternately performing chest compressions and handling airway and one nurse for medication should enter the room after wearing complete Personal protection equipment (Hazmat suit, cap/hood, goggles/face shield, fitted N95 respirator, full sleeve water impermeable gown, double gloves and boots) and close the door. It is preferable to leave the patient connected to ventilator as it forms a closed circuit and increase FiO₂ to 100%, turn off the trigger, set the ventilator rate to 10 breaths/min and limit tidal volume (Tv) to 6 ml/kg on pressure control mode of ventilation. If airway is not in place, to minimize aerosol, complete seal of the face mask is ensured and may require another person to prepare for intubation. A supraglottic device like Laryngeal mask airway (LMA) may also be used during resuscitation.

12. **Course and prognosis**: Respiratory failure occurs around day 7 of onset of symptoms with a peak severity at day 10. Recovery starts by about day 14. The mortality is as high as 60% in critically ill adults.
**Figure 1. RSI algorithm in children with suspected or confirmed COVID-19**

RSI – Rapid sequence intubation, COVID-19 – Coronavirus infection-19,
PPE – Personal Protective Equipment, ECG – Electrocardiography,
SpO₂ – Oxygen saturation by pulse oximetry, ETT – Endotracheal tube,
NRM – Non-rebreathing mask, IV – Intravenous, ETCO₂ – End tidal carbon dioxide

| Preparation | *PPE donned personnel* - Airway operator, airway assist, nurse  
  • ECG, SpO₂ monitors attached, ventilator with disposable circuit & expiratory filter (kept on standby), Yanker suction attached to wall suction  
  • Intubation tray on the leftside of patient head  
  • Appropriate cuffed ETT on right side, fixing length marked  
  • Drug tray with prefilled, diluted labelled syringes with drugs  
  • Intubation trolley placed outside the room |
|---|---|
| Positioning | • Shoulder roll for <2 years  
  • Head roll for >2 years  
  • Use hood enclosure/plastic sheet to cover head & thorax  
  • Ensure Intubation tray, Yanker suction & ETT inside the hood |
| Pre-medications | • IV Atropine - 0.02 mg/kg |
| Pre-oxygenation | • Preoxygenate for 5 min with NRM  
  • If unsuccessful, use mask-filter-bag assembly  
  • Airway operator holds mask by 2 hand technique  
  • Assistant holds bag without bagging or gives small breaths |
| Induction/Paralysis | • After SpO₂ is maintained ≥ 96%, nurse administers drugs  
  • IV Midazolam - 0.2 mg/kg  
  • IV Fentanyl - 2 mcg/kg  
  • IV Vecuronium - 0.2 mg/kg  
  • Wait for cessation of respiration (30-40 sec) |
| Placement with proof | • Airway operator proceeds for laryngoscopy after SpO₂ ≥ 96%  
  • Suction if necessary using Yanker suction  
  • Visualize glottis & intubate - look for mist  
  • Airway assist inflates ET cuff, attaches viral filter & ventilator  
  • Look for chest rise & maintenance of SpO₂ ≥ 96%  
  • If available, confirm by ETCO₂ |
| Post-intubation management | • Airway operator holds the ETT & nurse fixes with dynaplast  
  • Airway operator removes the hood/plastic sheet  
  • Hood kept for cleaning using 1% sodium hypochlorite  
  • Sheet to be rolled without touching inner surface and disposed  
  • Airway assist titrates ventilator setting |
Table 1. Contents of Intubation tray, drug tray and intubation trolley

<table>
<thead>
<tr>
<th>Intubation tray</th>
<th>Drug tray</th>
<th>Intubation trolley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-mask</td>
<td>Atropine</td>
<td>ETT of other sizes</td>
</tr>
<tr>
<td>HMEF/ Viral filter</td>
<td>Midazolam</td>
<td>Stylet</td>
</tr>
<tr>
<td>Self-inflating/ flow-inflating bag</td>
<td>Fentanyl</td>
<td>LMA</td>
</tr>
<tr>
<td>(Ambu bag with reservoir/Bains circuit)</td>
<td>Vecuronium</td>
<td>Video-laryngoscope</td>
</tr>
<tr>
<td>Laryngoscope with blade</td>
<td>Adrenaline</td>
<td></td>
</tr>
<tr>
<td>Appropriate size cuffed ETT</td>
<td>Saline flush</td>
<td></td>
</tr>
<tr>
<td>2mL syringe for ETT cuff inflation</td>
<td>Adhesive tape</td>
<td></td>
</tr>
</tbody>
</table>

HMEF- Heat moisture exchanger with integrated viral & bacterial filter, ETT- Endotracheal tube, LMA- Laryngeal mask airway

Fig 2. Strategies for management of PARDs

PARDs- Pediatric acute respiratory distress syndrome, COVID-19- Coronavirus infection-19
TV- Tidal volume, PEEP-Positive end expiratory pressure, $P_{\text{plat}}$ – Plateau pressure, NMB – Neuromuscular blockade
1. What is PPE?

Personal Protective Equipment (PPE) is a specialized clothing or equipment worn by a person for protection against infectious material. It includes gloves (sterile or unsterile; latex or nitrile), medical masks (triple layer or respirators like N95 or FFP2 standard or equivalent), goggles, face shield (where splash or spraying), head covers and gowns/coverall with or without aprons (fluid resistant).

2. How does PPE protect us?

PPE is only one effective measure for infection prevention and control and is not a replacement of basic hand hygiene, respiratory hygiene, social distancing etc. COVID-19 virus is transmitted between people through close contact and droplets. PPE prevents contact with the infectious agent or body fluid by creating a barrier between the worker and the infectious material.

0. Rational use PPE

a) Choosing PPE A combination of PPE types is available to protect all or parts of the face from contact with potentially infectious material. The selection of PPE is described should be used based on

   a. Risk of exposure setting e.g. high risk areas like hospital or low risk like community

   b. Type of personnel like health care workers including doctors, nurses, cleaning staff, administrative staff etc.

   c. Transmission dynamics of the pathogen e.g. contact, droplet or aerosol
<table>
<thead>
<tr>
<th>Setting and Activity</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospital setting</strong></td>
<td><strong>Healthcare workers (Doctor/Nurses/Technician)</strong></td>
</tr>
<tr>
<td>Inpatient setting and other high risk areas</td>
<td></td>
</tr>
<tr>
<td>1. ICU and critical places where aerosol generating procedures/SARI Wards/sample collecting/ Dead Body Packaging** / Mortuary while doing autopsy**</td>
<td>N95 masks, eye protection (Goggles or Face shield), Gown (Water resistant) Gloves (Double) Apron (optional if gown not fluid resistant), Shoe covers/boots</td>
</tr>
<tr>
<td></td>
<td>Cleaner**/Sweeper/Laundry handling</td>
</tr>
<tr>
<td></td>
<td>N95 and Gloves</td>
</tr>
<tr>
<td></td>
<td>Eye protection, Gowns and boots may be added depending on chances of splash with infective material</td>
</tr>
<tr>
<td></td>
<td>Administrative/Financial/Engineering/security staff</td>
</tr>
<tr>
<td></td>
<td>Visitors accompanying IPD/attending OPD</td>
</tr>
<tr>
<td></td>
<td>Triple layer mask</td>
</tr>
<tr>
<td>2. <strong>Outpatient Department</strong></td>
<td>Doctors and health care workers and sanitary staff</td>
</tr>
<tr>
<td>1. Doctors chamber, Isolation rooms</td>
<td>N95 and Gloves</td>
</tr>
<tr>
<td>Triage areas in OPD, Temperature recording areas, Help desk, Registration counters, Dead body transport and handling</td>
<td></td>
</tr>
<tr>
<td>2. <strong>Waiting areas</strong></td>
<td>Visitors and staff: Triple layer mask</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td></td>
</tr>
<tr>
<td>1. <strong>Public areas</strong> like markets, schools, shopping areas etc</td>
<td>No Medical Masks. Cloth masks/handkerchiefs</td>
</tr>
<tr>
<td></td>
<td>No Medical Masks</td>
</tr>
<tr>
<td>2. <strong>Home</strong></td>
<td>Triple layer mask, Gloves, Apron (if risk of splash)</td>
</tr>
<tr>
<td>i. Asymptomatic</td>
<td></td>
</tr>
<tr>
<td>ii. Providing direct care of confirmed cases or when handling stool, urine, or waste from COVID-19 patient being cared for at home</td>
<td></td>
</tr>
<tr>
<td>iii. Patient with respiratory symptoms or those entering rooms of COVID 19 cases not involved in direct care but entering room</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Triple layer mask</td>
</tr>
</tbody>
</table>

*Aerosol generating procedures (e.g. tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy)** **Use PPE for heavy-duty tasks (e.g. rubber gloves, rubber apron and resistant closed shoes) in addition to regular PPE.*
b) Method of Using PPE

- **Steps of donning PPE** (in designated area before you have any contact with the patient, generally before entering the room)
  - Remove home clothes, jewelry, watches, electronic etc. and wear clean hospital scrubs
  - Perform Hand Hygiene.
  - Sequence Shoe covers • Gown first • Mask or respirator • Goggles or face shield* hood • Gloves
  *Remove gloves if they become torn and perform hand hygiene before donning new gloves •

- **Steps of doffing PPE**: (in the designated area)
  - All the PPE must be discarded in the yellow bin.
  - Hand hygiene MUST be performed after every step
  - Sequence: Shoe covers Gloves • hood*Face shield or goggles • Gown • Mask or respirator (outside the room)
  *Check for any leak or soiling in PPE before doffing. If any, disinfect the area before doffing. If any leak is found in PPE while caring for infected patients, caring personnel should self-quarantine

- **Do’s and Don’ts with PPE**
  - All components of PPE should be worn with right techniques and properly fitted.
  - Use PPE carefully to prevent spreading contamination. Limit surfaces and items touched. Avoid touching or adjusting other PPE. Keep gloved hands away from the face.
  - PPE should be changed after any significant soiling, splashing or damage OR after each sessional use OR as per manufacturer’s guidelines
  - All items of PPE to be supplied need to be accompanied with a certificate of analysis from national/international organizations/labs indicating conformity to standards.
Different types of masks; advantages and disadvantages

“Masks are effective only when used in combination with frequent hand cleaning with alcohol based hand rub or with soap and water. If you wear a mask you must know how to use it and dispose of it properly”. WHO

Though Covid-19 virus been defined as type 2 contagious germ but been considered as type 1 contagious germs (like plague and cholera) by virtue of it being novel and hence public in general lack natural immunity against covid-19. It can spread from person to person via droplet which can remain in air for few hours and on various surfaces anywhere between few hours to three days.

It is important to protect ourselves, our patients, family, community and environment in general. It is imperative to follow certain standard infection control and preventive measures such as hand hygiene, respiratory hygiene and rational usage of personal protective equipment (PPE) according to risk. Wearing a mask properly can effectively block respiratory droplets containing viral particles from entering the body directly. The use of face mask is crucial for people at health care centres and at home taking care of covid19 contacts.
COMMON TYPES OF MASKS

Disposible masks
1. Surgical face masks
2. N95/KN95 respirators

Reusable masks
1. Cotton masks (can be handmade also)

Surgical face masks: It consists of three layers
1. Outer layers id hydrophobic – prevents droplets from entering the mask
2. Middle layer- has a filter which can block up to 90% of particles of more than 5 micro meter diameter
3. Inner layer – comes in contact with nose and mouth, and absorbs moisture

Present study found that surgical masks to be effective in preventing covid-19 and can be used while handling respiratory patients.

Respiratory Masks: Also called as N95 – American origin, KN 95– Chinese origin
*N indicates Non-Oil based uses
*95 means filtration efficiency up to 95%

Both N95 and KN95 are equally effective and can filter up to 95% of viral particles of size greater or equal to 3 micro metre

Again N95 comes in two types
- N95 with Non breathable valve which is ideal for present situation and
- N95 with breathable valve for elderly chronic sick patients having respiratory or cardiac problems and if it at all they use these type of masks then attending people should wear masks.
(N95 masks to be used while attending aerosol generating procedures)
Re usable cotton masks: Its double layer mask can be made indigenously using 100% cotton cloth, handmade cheaper and can be washed and reusable and is about 70% as effective as surgical face mask at capturing small virons and other particles and not ideal for the present situation.

Since children faces are small, it is recommended to use mask especially designed by reputable manufacturers.
<table>
<thead>
<tr>
<th>N95</th>
<th>TRIPPLE LAYER MASK</th>
<th>RE USABLE COTTON MASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be used by health workers while attending aerosal generating procedures</td>
<td>To be used by health workers while attending non aerosal generating procedures and high risk elderly patients</td>
<td>WHO has recommended to be used by public in public places and at home while attending sick patients</td>
</tr>
<tr>
<td>#Can it be re used ?</td>
<td>To be used only once and to be disposed as biological waste material</td>
<td>Can be washed, can be boiled in hot water pot for few minutes and dried for 5 hours, Ironed after washing the hands and can be reused.</td>
</tr>
</tbody>
</table>

**Note:**

# AIIMS have recently recommended that N95 can be used up to 20 days after drying in a micro oven at 70 degrees centigrade for 30 mts

## Off label it is told, considering Covid !9 virus cannot survive more than 3 days, hence once used N95 mask can be hung in the air may be on terrace or secluded place with good ventilation for three days and can be reused on 4th day.
<table>
<thead>
<tr>
<th>MASK TYPES</th>
<th>INTENDED USE</th>
<th>FILTRATION EFFICIENCY</th>
<th>NUMBER OF USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>N95 masks (Without a breathing valve)</td>
<td>Also known as N95 respirators. A type of respiratory protective gear that can effectively filter particulates in the air and is suitable for protecting against airborne respiratory infectious diseases.</td>
<td>Blocks at least 95% of very small particles (approximately 0.3 μm in size)</td>
<td>Can be reused or used extendedly. Discard the masks when they get damaged, deformed, wet or dirty.</td>
</tr>
<tr>
<td>N95 masks (With a breathing valve)</td>
<td>Same as N95 masks without a breathing valve. The breathing valve has a delicate design with several flaps. It allows the exhaled air to escape without letting small particles enter. This design makes exhaling easier and helps reduce the accumulation of moisture and heat.</td>
<td>Same as N95 masks without an exhalation valve. It blocks at least 95% of very small particles (approximately 0.3 μm in size)</td>
<td>Same as N95 masks without a breathing valve.</td>
</tr>
<tr>
<td>Surgical masks</td>
<td>Used as basic protective gear for medical professionals or related personnel. It protects the wearer from splashes and droplets that may contain germs.</td>
<td>The filtration efficiency of surgical masks is not uniform. Some might perform worse than required of surgical masks or medical protective masks. In general, particles that are roughly 5 μm in size can be filtered out. There is a water-repelling outer layer which blocks droplets from entering the mask; the middle layer is a filter layer.</td>
<td>Single use</td>
</tr>
<tr>
<td>General medical masks</td>
<td>Single-use protection masks for medical procedures. Generally used in ordinary environments to block particles (such as pollen) other than pathogenic microorganisms.</td>
<td>Does not fulfill the filtration efficiency requirements for particles and bacteria, or has lower requirements than surgical masks and medical protective masks.</td>
<td>Single use</td>
</tr>
<tr>
<td>Cotton face masks</td>
<td>Used to keep warm and block larger particles such as dust.</td>
<td>Can only filter larger particles, such as soot or dust.</td>
<td>Washable and reusable</td>
</tr>
</tbody>
</table>
MANAGEMENT OF MASK

Masks should be used rationally of right type by appropriate persons as it involves financial burden, procurement burden and more so it gives false sense of security while neglecting other preventive measures such as distancing and hand hygiene.

INSTRUCTIONS FOR USAGE:

1. Identify the front, back, top & bottom of mask
2. Wash your hands before wearing
3. Ensure mask covers nose, mouth and fit closely around the face. Some masks have stiff band like strips on top and front side for a better grip around the nose.
4. Ensure no air leaks from the side when one breathes out voluntarily
5. Wash hands whenever you touch the mask accidentally
6. Wash hands before/after adjusting masks if required

HOW TO REMOVE MASK

First remove gloves if you are wearing / wash hands/remove face mask/dispose by holding strings and again wash hands.

**Demonstrated by Dr. Gargi Goel, Pediatrician, Rajasthan**
WHEN TO CHANGE MASKS

Masks need to be regularly replaced

1. When masks cannot fit tightly
2. When mask is damaged/contaminated with blood/respiratory droplets
3. Difficult to breathe through mask
4. After contact/exit from isolation wards/ICU having covid-19 infected persons

At present international organisations have no definite guidelines for optimal durations of wearing masks. However, it is being practised to DISCARD- Surgical masks after 4-6hrs of usage, N95 respirators after 8 hours of usage but CDC recommends extension of usage up to 3 days in resource limited places.

DONTS:

1. Do not wear mask when clinically not indicated
2. Do not forget to follow social distancing, regular hands and respiratory hygiene
3. Do not allow mask to tangle around the neck
4. Do not touch mask while wearing
5. Do not re use disposable masks
6. Do not use masks for longer period other than prescribed duration.
How to manage OPD during the COVID 19 pandemic

Background
This document provides guidance for outpatient settings during 2019 Novel Coronavirus (COVID-19). Prompt detection and effective triage and isolation protocols of potentially infectious patients is important. Effective infection control protocols in the outpatient setting can prevent unnecessary exposures among patients, healthcare personnel, and visitors at the facility. Healthcare personnel should adhere to **Standard, Contact, and Droplet Precautions**.

With enough evidence that India is in stage of community transmission, OPDs of general paediatricians need to be modified to avoid putting HCWs at a risk of getting infected and also to avoid the situation where these setups from becoming hotspots of transmission of the virus. With most of the western countries switched to e-data base for OPDs and e prescription.

- Many of OPDs in India still use physical paper prescription format this being a potential fomite.
- Most of patients with GPs are walk ins and triage is difficult.
- Number of patients is to the tune of 50 to 100 per day.
- Every new infection prevented will be a Critical step in controlling the pandemic.

Consultation planning

- Provide as many paid tele consultations as possible at least for next few weeks
- Use pre-visit communication systems through telephone and text appointment reminders or patient portals if available.
- Conduct active outreach to patients to instruct those at risk for COVID-19, such as contact with a person with COVID-19 in 14 days prior to symptom onset, to call before their clinic appointment.
- When scheduling appointments by phone, provide instructions to persons with signs or symptoms of COVID-19 on how to arrive at the clinic, including which entrance to use and the precautions to take (e.g., how to notify clinic staff, don a facemask upon entry, follow triage procedures).
- Ask patient to wear a surgical or procedure, if tolerated, and place the patient in a private exam room, and close door.
- If possible, schedule appointment at the end of day or at a time when clinic is not busy.
- Alternate sittings in OPDs so that all maintain a distance of three feet on the sides, front and back.
- Do not have people waiting at OPD or diagnostic areas; minimize the waiting time by providing spaced appointments.
• Make your OPDs door movements less. Keep the doors of consulting rooms permanently open so nobody needs to touch them while opening or closing.
• Keep a separator or rope to avoid people touching the registration counter.
• Patients with respiratory symptoms need not approach the counter, directly go to a separate room spacious and airy and sit on a stool in the centre of the room where they cannot touch anything in the surrounding...you can quickly examine the patient and come out ....you can discuss about the condition with their relatives in another room
• Inform all patients that if they or any close contact has and fever they should call first and not visit the clinic/hospital without tele consultation.
• Ask the parents to postpone routine vaccinations ,counsel them that it can be undertaken at a later date
• Educate the staff about hand wash, respiratory and personal hygiene and cough etiquette
  1. Hand wash: Any soap and water, 20 seconds, >60% alcohol based sanitizer
  2. Respiratory hygiene: cough and sneeze on tissue paper or sleeves
  3. Cough: Maintain a distance of 1-2 meters

Visual Alerts

Post visual alerts (in appropriate languages) at the entrance to outpatient facilities, instructing patients and persons who accompany them (e.g., family, friends) to inform HCP of symptoms of a respiratory infection and any recent travel history when they first register for care and to practice respiratory hygiene and cough etiquette.

Respiratory Hygiene and Cough Etiquette

Recommend that all persons with signs and symptoms of a respiratory infection the following measures to contain respiratory secretions:

• Cover your mouth and nose with a tissue when coughing or sneezing
• Use nearest waste receptacle to dispose of the tissue after use
• Perform hand hygiene (e.g., hand washing with non-antimicrobial soap and water, alcohol-based hand rub, or antiseptic hand wash) after having contact with respiratory secretions and contaminated objects/materials. Wash hands with soap and water if they are visibly soiled.
• Ensure the availability of materials for adhering to respiratory hygiene and cough etiquette in waiting areas and patient care area for patients and visitors.
• Provide tissues and no-touch receptacles for used tissue disposal.
• Provide conveniently located dispensers of alcohol-based hand rub. Where sinks are available, ensure that supplies for hand washing (i.e., soap, disposable towels) are consistently available.

Masking and Separation of Persons with Respiratory Symptoms
Offer masks to persons who are coughing. Either procedure masks (i.e., with ear loops) or surgical masks (i.e., with ties) may be used by patients and visitors to contain respiratory secretions (respirators such as N-95 or above are not necessary for this purpose). Minimize the time patients with acute respiratory symptoms spend in waiting area by placing them in a private room with the door closed or encouraging coughing persons to sit at least six feet away from others in common waiting areas. Persons escorting patient to private room should maintain a distance of 6 feet from masked patient while in a public area.

Once patient is roomed, staff should only enter in recommended PPE:

- Provide access to surgical masks, liquid soap & sanitizers to all staff
- Educate every one about good food, rest, walks
- Allow non-essential staff to work from home
- Use infrared thermometers at the reception desk
- Check temperature of everyone entering the premises

**Practice social distancing**

- Call patients with appointments to avoid crowding at reception / waiting area
- Make them wait in their car and inform them through phone when their appointment is due
- Provide separate waiting area for suspected COVID-19 patients (six feet distance), if possible
- If possible make all OPD patients wear masks
- Have a backup ready to cover for ill staff

**While examining patients**

- Keep a distance of three feet, examine chest from back, make patient not sit face to face but face to side
- If possible, run special cough cold and fever OPD for one hour at a fixed time
- Remember cold and stuffy nose is present only in 4% of COVID 19 patients. It is flu unless proved otherwise.
- Avoid throat examination unless absolutely necessary.
- Postpone non emergent cases or see them on video call
- Stock essential medical supplies
- Make a plan to handle rise in cases and hence increased patient volume.
- Maintain supply of masks, disinfectant/sanitizer and other personal protective equipment
- Disinfect three times a day
- Disinfect all things that you touch during work; including computers, keyboards, scanners, door handles, BP instrument, stethoscope, SPO2monitor with alcohol swab
- Room with 0.1% bleach solution three times a day
- Keep hand sanitizer at all strategic points like reception, procedure rooms, reporting rooms etc

**Environmental sanitation:**
Environmental surfaces could potentially contribute to cross-transmission through hand contact with contaminated surfaces, medical equipment, or patients. Daily wet mopping of floors and surfaces close to patient care is a must. Particular attention is to be paid for surfaces like door knobs which are most commonly handled by patients in the clinic. It is preferable to use a disinfectant over plain soap and water with a contact time of at least 30-60 seconds.

Spills of blood on surfaces should be promptly cleaned with detergent followed by bleach (1:100) using gloves. Disinfectants can get contaminated by bacteria like pseudomonas if diluted when not recommended or not properly diluted as per manufacturers recommendation. The wet mops can become heavily contaminated with microbes and can spread this contamination in subsequent cleaning if they are not decontaminated regularly. Immersion of reusable wipe in hypochlorite solution (4000 ppm) is one effective way of decontamination.

**Maintenance of reusable medical equipments:**

- The bell and diaphragm of stethoscope, ear piece of otoscope, infantometer, BP cuffs are noncritical equipments which come in contact with intact skin. Therefore they are at low risk of infection transmission and require low disinfection like washing with plain water and soap.
- Infant weighing scales can be washed with soap and water. Separate clean paper (clean newspaper if sterile paper is not economically feasible) should be used for every baby to prevent risk of hypothermia and cross contamination. Strong disinfectant solutions should be avoided.
- Clinical thermometer should preferably be used in contact with intact skin like in axillary fold rather than mucous membrane like rectal mucosa. It can be washed with soap water or wiped with 70%-90% ethyl or isopropyl alcohol with a contact time of at least 30 seconds and air dried.
- Disposable sterile tongue depressors are recommended.

**For the medical professional**

- Immunocompromised, who have six minutes’ walk distance< 200 meters, are unvaccinated for flu and pneumonia
- Caution: Doctors aged more than 65 years with uncontrolled diabetes, (with common secondary or co-infections) should completely stop OPDs and only give tele consultations.
- Always wear surgical masks; Stop doing any procedure where aerosols may be produced like nebulisation
- Doctor with cough and fever should go for self-quarantine and COVID assessment, In a WHO study from Italy, it has been shown that 90% of doctors attending patients were asymptomatic when they were tested COVID-19 positive.
- Install air purifiers with 10 air exchanges per hour rate at the clinic if possible
- While returning home: When you come back home from you clinic, wash feet first, then hands, face, change cloths (keep them in separate box for washing), decontaminate all surfaces you have touched including your car, wash hands again with soap and water.
• Stay away from elderly people in your home if possible.
• Your young children should not be looking after your parents.

Note: Please refer to section on use of mask for recommendation regarding use of mask by HCW in OPD

**Telemedicine In Current Context**

We, in the medical fraternity, have been shaken by this ghastly pandemic and its ever increasing toll on human lives and the challenges to our colleagues at the front lines of the war. Everyone else in the fraternity has also been drastically affected by the Social Distancing and Lockdown imposed to contain the pandemic. This has been the greatest challenge to medical practice in several decades and threatens to disrupt the way we practice henceforth- even after the social distancing is relaxed over the next many months.

In this scenario, the need for a structured telemedicine solution is more acute than ever before- both from the patient’s and nation’s health, as well as from the doctor’s professional point of view. As a pediatrician, the essential connect between the child, the parent and the professional has been disrupted. Every part of our practice will have to be modified to keep ahead of this challenge. Children will still need to be seen by the pediatrician and our pediatricians must have an immediate, easy to use, secure solution for tele-consultations, prescriptions and payments.

Telemedicine is an excellent solution connecting both patients - doctor and doctor - doctors. The Government of India recently came up with new telemedicine guidelines. Telemedicine is here to stay post the pandemic as, in essence, it offers path breaking advantages. However, one needs to be cognizant of the limitations of this practice and consult within the defined parameters.

**What are the benefits of Telemedicine?**

1. Telemedicine helps us pediatricians to give equal access to quality care.
2. Our services are made available on a common platform to a large patient list who can avail this service at the comfort of their homes/ offices, while travelling, etc.
3. The patients can schedule appointments and the doctors can focus on one patient at a time- without an impatient restless queue at the door.
4. It is very cost efficient and saves a lot of effort that the doctor or the patient requires to travel to reach the clinic.
5. The patients are aware of their appointment time and the unnecessary wait is avoided.
6. One does not need to run to the nearest hospital or clinic for simple health care solutions that can get resolved online, and they need to just rush to the hospital in case advised by the Online pediatrician, an ideal and cost-effective method for all.
7. During disasters and pandemics (that we are currently facing), it provides safety to both the doctors and the patients.
8. Our members can also maintain the records efficiently, which helps them to have faster and timely access during a follow up.

Gov. of India regulation

(Reference: https://www.mohfw.gov.in/pdf/Telemedicine.pdf)

Guidelines to be followed for Telemedicine in India:

The guiding principle of telemedicine is the use of sound professional judgement of a Registered Medical Practitioner (as all of us are registered with the Medical Council of the State).

This is based on the fact that

- teleconsultation should be sufficient to make a sound judgment of the medical condition, and
- quality of care should never be compromised.

There are 7 important elements to be considered before any telemedicine consultation:

1. **CONTEXT OF TELECONSULTATION**
   Sound professional and medical judgement should be exercised while keeping the patient’s well-being as utmost priority. The final outcome of the consultation should be close to, if not exactly the same outcome of a “Face to Face consultation”, but within the intrinsic boundaries of Telemedicine.

2. **IDENTIFICATION OF THE RMP AND THE PATIENT**
   Identities of both the RMP and patient should be known to each other. Pediatrician should verify the patient, should identify himself/ herself at the beginning of the consultation and then record the patient's name, age and phone number,

3. **MODE OF COMMUNICATION**
   There are various platforms to deliver telemedicine and all have pros and cons and hence have to be adequately assessed before being utilized by us as Doctors.
   
   The real time video-based mode is preferable than just exchange of information on SMS, chats or emails. Once again the sound judgement of the doctor should help in making a prudent decision on the technology.
4. **PATIENT CONSENT**
   Consent can be implied or explicit and this could be recorded. If the patient is reaching out to the doctor for an appointment through text or WhatsApp, this gets recorded automatically.

5. **EXCHANGE OF INFORMATION FOR PATIENT EVALUATION**

   We are all aware of the limitations of telemedicine and hence if there is a requirement of a physical examination then we should recommend the patient to come to the clinic or show to a nearby RMP/ Health Worker.

   Again, it is very important that we capture adequate patient details, history, symptoms, etc. on the prescription clearly. Ensure all patient records are properly maintained at your end after the telemedicine consultation is over.

6. **TYPES OF CONSULTS: FIRST CONSULT / FOLLOW UP CONSULT**

   For the first tele consult, RMP has limited knowledge; hence it is advisable to have a video consultation since that helps in better judgement.

   Follow up consultation can be done over audio channels if the patient is consulting the same RMP within 6 months of the previous consultation.

7. **PATIENT MANAGEMENT: HEALTH EDUCATION, COUNSELING & MEDICATION**

   If the patient can be treated appropriately through telemedicine then we should further proceed to provide health education, provide counseling and prescribe medication.

   We also need to keep in mind prescribing medicines without an appropriate diagnosis will amount to a professional misconduct.

   The categories of medicines to be delivered are listed as List O or List A.

   List O - Over the Counter Medicines - which are safe to prescribe through any mode of teleconsultation

   List A - Medicines which can be prescribed during the first consult (which is a video consultation) and re-prescribed for refill for existing conditions during a follow up.

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**Available Telemedicine Solutions & How to Assess**

IAP looked at different telemedicine offerings in the market and concluded that a simple solution needs to be developed keeping in mind the following:

1. The solution should be simple and elegant for doctors to adopt quickly
2. Should be something patients are familiar with and can start using without learning anything new
3. It should be secure, encrypted with no fear of data going to 3rd party service providers

IAP suggested a simple solution using some of the most widely used and secure platforms in the world –

- WhatsApp Business for consultation, along with
- Paytm (for Business) to manage payments.

A simple and practical solution with literally no learning curve for our doctors or patients. A doctor can get his/ her telemedicine practice started within 30mins in 2 simple steps:

1. Download and setup WhatsApp Business and Paytm for Business Apps on the mobile
2. Activate special Paytm features by registering your account on https://diapindia.org/telemedpaytm.php

Thus, instead of subscribing to an expensive Rs. 15-20k per annum telemedicine software, where you always have the fear of your data being misused, IAP’s solution is very simple and employs platforms used by millions of people day in and day out. This is completely free for IAP members.

Benefits for IAP members from Paytm

- All IAP doctors will get upgraded as ‘Unlimited Merchants’ and get payment link enabled. These are enterprise level features and not available to individual Paytm merchants.
- Special deal on physical POS/ EDC machine once the lockdown is over – Paytm field team will be in touch directly.
- Special offers from Paytm from time to time.

IAP recommendations - in terms of COVID-19

Here’s a guideline on classification of COVID-19 patients and a quick reckoner on how to get started with your telemedicine consultation.
Summary

1. Telemedicine is the need of the hour in the current context as well as thereafter.

2. Judgement needs to be exercised in the assessment of the case. In case of doubt, err on the side of safety and insist on physical examination by you or any doctor close to the patient.
3. After detailed study and thorough evaluation, IAP has suggested a telemedicine solution for members wishing to avail the same.

For details:
Please contact helpdesk@diapindia.org

(Acknowledgement: I hereby acknowledge Team dIAP for their inputs.)
Govt of India has taken a number of steps to deal with Covid19 pandemic. Most of the materials are available from https://www.mohfw.gov.in/ the official website of the health ministry and on the website of ICMR https://www.icmr.nic.in/content/covid-19, and National Center for Disease Control https://ncdc.gov.in/index4.php?lang=1&level=0&linkid=127&lid=432. For updated authentic information on Covid19 you may visit these websites. Following is the summary of the information available on these websites along with the links.

**Patient management resources**

Guidelines on Clinical management of severe acute respiratory illness (SARI) in suspect/confirmed novel coronavirus (nCoV) cases. These guidelines from National Center for Disease Control, New Delhi outlines the management of suspected and confirmed cases of Covid-19. A very useful document for practical tips on management.

https://ncdc.gov.in/WriteReadData/l892s/96997299691580715786.pdf

Case definitions are very important in Covid-19 infections and discharge policy is also equally important for reducing community spread of Covid-19. This document provides discharge policy of Covid-19 patients and some useful case definitions.

https://ncdc.gov.in/WriteReadData/l892s/23914145951584779119.pdf

Emergency Management Response Division of MoHFW GoI has released this document “Advisory for human resources management of Covid-19”. This is a very important document and it contains almost everything required by health care providers including specialist doctors, nurses and other support staff in various health care settings. It provides links to large number of resources required for management of Covid-19 patients.

https://www.mohfw.gov.in/pdf/AdvisoryforHRmanagement.pdf

ICMR has specified the strategy for testing (RT-PCR) for Covid-19.


ICMR has released advisory for antibody test of Covid-19 and the subsequent actions.

https://icmr.nic.in/sites/default/files/upload_documents/Advisory_Antibody_Testing_04042020.pdf

Resources for doctors and other health care workers are available from AIIMS New Delhi youtube channel. Recordings of the webinars conducted by AIIMS are available here. Very useful material indeed.

https://www.youtube.com/playlist?list=PLRlCeuHqjvr6d_YG1D14NRRsD4hFl_Tzd.

Webinars conducted for nurses are available at https://www.youtube.com/channel/UCIhIpqB1ENbKtsWsVkJ0P_vg
Training resources available from various organizations have been summarized on this document from MoHFW.


This is the latest document dated 31 March 2020 from MoHFW on Revised guidelines for Covid-19 management and it provides all the information required by clinicians.


Government of India has provided essential technical features of ventilators for use in Covid-19 patients.


This document provides guidelines for transportation and pre-hospital care of Covid-19 suspect patients.


During this medical emergency situation of Covid-19 pandemic, effective use of human resources become critical and all the doctors irrespective of their specialisation and training are required for various duties in hospital and medical colleges. This guideline provides for categorization and deployment of various doctors from faculty/specialists to medical students.


Covid-19 infection has high mortality and this document provides guidelines for management of dead bodies and their autopsy.


Biomedical waste disposal is a very important part of health care facility management for stopping further spread of infection to the health care workers and to the community. NCDC has given these guidelines with regard to Covid-19.

https://ncdc.gov.in/WriteReadData/l892s/63948609501585568987.pdf

Telemedicine has become very important in these trying times of lockdown. MCI has authorized the practice of telemedicine in India. Details are available from this document.


Protection of health personnel and Personal Protective Equipment

Everyone is facing difficulties in procuring face masks. This advisory from government provides methods for making home-made masks for general public. Very useful document for sharing with parents of our patients.

https://www.mohfw.gov.in/pdf/Advisory&ManualonuseofHomemadeProtectiveCoverforFace&Mouth.pdf

Personal protective equipment (PPE) has become an anxious point of discussion for its evidence based use and availability. This document from EMR Division of MoHFW provides rationale use of PPE by various health care providers in different situations and areas in a hospital.


Protection of health care providers is of utmost importance and prophylaxis by hydroxychloroquine has been suggested by MoHFW.
Public health measures

Containment plan for large outbreak. This document summarizes the broad policy of the government to deal with the Covid19 epidemic and describes in details the plan for containment of large outbreaks. After reading this document one would understand the various steps being taken by the government currently. Learn about geographic quarantine here. Find this document at https://www.mohfw.gov.in/pdf/3ContainmentPlanforLargeOutbreaksofCOVID19Final.pdf.

This advisory was given to hospitals to adjust their services for better care of Covid-19 affected patients. Although it was applicable till 31 March 2020, it is still relevant in the current situation. https://www.mohfw.gov.in/pdf/AdvisoryforHospitalsandMedicalInstitutions.pdf

Mental health issues

Minding our minds during Covid19 pandemic. This document suggests the ways to handle ‘social isolation’ and ‘emotional problems’, to recognise mental health problems in near and dear ones, and the challenges faced by people with mental health illnesses. https://www.mohfw.gov.in/pdf/MindingourmindsduringCoronaeditedat.pdf

Mental health during this lockdown period has become an important area. NIMHANS has released this poster on mental health of children.


These videos by Prof Shekhar Sheshadri, NIMHANS provide good tips on keeping good mental health for children and for adults.

https://www.youtube.com/watch?v=OYD9bogtJlU&feature=youtu.be
https://www.youtube.com/watch?v=GPwn_e9juvg&feature=youtu.be

Covid-19 research

Clinical research in Covid-19 is very important to study the disease as it happens in India. Many Pediatricians would be interested in collecting data on Covid-19 disease in children. This website (as mentioned in NCDC document) provides international harmonised protocols and research tools for data collection. It is important to use such tools for better comparison of our data with that from other countries. This also increases the probability of publication in good journals. https://isaric.tghn.org/covid-19-clinical-research-resources/ and https://isaric.tghn.org/sprint-sari/

Indian Journal of Medical Research is a journal by ICMR and it has published a special issue on COvid-19. The table of content with full text article links are available at

http://www.ijmr.org.in/aheadofprint_cv.asp

This paper from IJMR April 2020 describes the guidelines for converting existing health care facilities into Covid-19 care facilities. This has specifications and appropriate guidelines for preparing various components of hospital / clinic for dealing with patients with Covid-19.


Miscellaneous
NCDC has published guidelines for Residential Welfare Associations for maintaining the premises. Very useful for many of us.

https://ncdc.gov.in/WriteReadData/l892s/3931246121585916767.pdf

Compiled on 5 April 2020 and all the documents were accessed on 5 April 2020.

COVID 19 - MYTHS AND REALITY

- **COVID 19 is an extremely benign paediatric infection.**
  When compared to adults, children with COVID 19 have been observed to show milder symptoms with better prognosis. However, clinicians need to be alert when dealing with children who are at higher risk, such as underlying pulmonary pathology, or immune deficiency states, as these have shown to be associated with severe outcomes from other coronavirus infections. Children may act as transmitters of the infection to adults in household and community.

- **Clinical diagnosis will be possible in the near future as we are going to encounter a large number of cases in the future.**
  Laboratory diagnosis is the only way to confirm COVID 19 in a child as the symptoms are mostly mild and mimic common viral illnesses. In adults, fever, lethargy, and lower respiratory symptoms are more common, while children have shown to have accompanying gastrointestinal symptoms, with upper respiratory tract symptoms.

- **It is only those who are symptomatic who are likely to transmit the infection.**
  Asymptomatic individuals with COVID-19 are capable of transmitting the infection to those who come in close contact. An example of asymptomatic transmission occurred in China, where an asymptomatic carrier absconded from his residence where he stayed with his brother, who contracted the infection through close contact and tested positive.

  A study done in February 2020 showed a similar viral load in both asymptomatic and symptomatic individuals.

- **High risk groups for COVID 19 have not been identified so far unlike adult**
  Antenatal smoking, underlying pulmonary pathology, obesity, Asthma, Cardiac Failure, any underlying chronic illness are some of the high risk factors identified.

- **Non respiratory symptoms rule out COVID 19 in children.**
  Most common symptoms in children are cough and fever. Less common are fatigue, diarrhoea, rhinorrhea, vomiting, and nasal congestion. Therefore, non respiratory symptoms do not rule out COVID 19 in children.

- **Negative PCR test rules out COVID 19 infection.**
  The COVID-19 RT-PCR test is a real-time reverse transcription polymerase chain reaction (rRT-PCR) test for the qualitative detection of nucleic acid from SARS-CoV-2 in upper and lower respiratory specimens (such as nasopharyngeal or oropharyngeal swabs,
sputum, lower respiratory tract aspirates, bronchoalveolar lavage, and nasopharyngeal wash/aspirate or nasal aspirate) collected from individuals suspected of COVID-19. The PCR test kit has its own limitations.

Reasons for false negative PCR -

• Error in sample collection.
• Difference in viral load. (Nasal swab is negative while sputum/BAL are positive)
• Window period - where the individual harbouring the virus does not yet have a viral load detectable by the PCR test.

● **HCQ prophylaxis is safe and can be used in children routinely.**

False. There are no current recommendations for the use of Hydroxychloroquin as prophylaxis in children below 12 years of age.

● **Vaccine will be available very soon.**

COVID-19 is a new virus and will require its own vaccine. Currently research is underway, supported by the WHO, and there is no proven vaccine yet. It may take at least a year for a safe vaccine to be made available for routine use.

● **If Respiratory PCR Panel with Biofire is positive for RSV, Influenza or Adeno, COVID-19 infection is unlikely.**

False - Children are susceptible to a variety of viruses, such as influenza viruses, parainfluenza viruses, adenoviruses, respiratory syncytial viruses, and rhinoviruses. Antibodies produced after infection may cross-react with the coronaviruses to provide some protection. However, co-infections can occur and are already reported.

● **CT scans and Xrays can predict COVID-19.**

Studies have shown that CT changes (ground glass appearance) occur prior to development of symptoms. There are no studies yet to define COVID-19 specific xray and CT findings.

● **Corticosteroids are necessary in severe cases.**

True - IV corticosteroids are indicated in cases with severe ARDS.

It is contraindicated in mild cases and as routine for COVID-19 infection.

● **Some lab parameters like Lymphopenia, High CRP, are definitive clues to COVID-19.**

Leukopenia, leukocytosis, and lymphopenia have been reported, although lymphopenia appears most common. Lymphopenia appears to be a negative prognostic factor.
Elevated LDH and ferritin levels are common, and elevated aminotransferase levels, elevated CRP have also been described.

On admission, many patients with pneumonia have normal serum PCT levels. However, in those requiring ICU care, they are more likely to be elevated.

High D-dimer levels and more severe lymphopenia have been associated with mortality.

The bottom line is that there are no definite diagnostic clues from routine lab tests for COVID-19.

- **Childhood infections are a low public health priority.**

False - While children have better prognosis compared to adults, they are still carriers of the virus and a likely medium of transmission.

**WHO Myth busters**

- Exposing yourself to the sun or to temperatures higher than 25C degrees DOES NOT prevent the coronavirus disease (COVID-19)
- You can recover from the coronavirus disease (COVID-19). Catching the new coronavirus DOES NOT mean you will have it for life.
- Being able to hold your breath for 10 seconds or more without coughing or feeling discomfort DOES NOT mean you are free from the coronavirus disease (COVID-19) or any other lung disease. Lab diagnosis is the best way to confirm.
- Drinking alcohol does not protect you against COVID-19 and can be dangerous
- COVID-19 virus can be transmitted in areas with hot and humid climates
- Cold weather and snow CANNOT kill the new coronavirus.
- Taking a hot bath does not prevent the new coronavirus disease
- The new coronavirus CANNOT be transmitted through mosquito bites.
- Hand dryers are not effective in killing the 2019-nCoV. To protect yourself against the new coronavirus, you should frequently clean your hands with an alcohol-based hand rub or wash them with soap and water.
- UV lamps should not be used to sterilize hands or other areas of skin as UV radiation can cause skin irritation.
- Thermal scanners cannot detect people who are infected but are not yet sick with fever. This is because it takes between 2 and 10 days before people who are infected become sick and develop a fever.
- Spraying alcohol or chlorine all over your body will not kill viruses that have already entered your body. Spraying such substances can be harmful to clothes or mucous membranes (i.e. eyes, mouth)
- Vaccines against pneumonia, such as pneumococcal vaccine and Haemophilus influenza type B (Hib) vaccine, do not provide protection against the new coronavirus. The virus is so new and different that it needs its own vaccine. Researchers are trying to develop a vaccine against 2019-nCoV, and WHO is supporting their efforts. Although these vaccines are not effective
against 2019-nCoV, vaccination against respiratory illnesses is highly recommended to protect your health.

- There is no evidence that regularly rinsing the nose with saline has protected people from infection with the new coronavirus.
- Garlic is a healthy food that may have some antimicrobial properties. However, there is no evidence from the current outbreak that eating garlic has protected people from the new coronavirus.
- People of all ages can be infected by the new coronavirus (2019-nCoV). Older people, and people with pre-existing medical conditions (such as asthma, diabetes, heart disease) appear to be more vulnerable to becoming severely ill with the virus. WHO advises people of all ages to take steps to protect themselves from the virus, for example by following good hand hygiene and good respiratory hygiene.
- The new coronavirus (2019-nCoV) is a virus and, therefore, antibiotics should not be used as a means of prevention or treatment. However, if you are hospitalized for the 2019-nCoV, you may receive antibiotics because bacterial co-infection is possible.
- To date, there is no specific medicine recommended to prevent or treat the new coronavirus (2019-nCoV).
**Don’t Believe**

As COVID 19 scarce shut down the world, a lot of messages are being forwarded in the social media without authentication and scientific validity. A recent survey conducted by the Pew Research Centre showed that people who gets news from social networks have some COVID misconceptions. Here are some common misconceptions that are being circulated in the social media:

1. Hand hygiene three two four times a day is sufficient. No
   Health care provider should perform hand hygiene by using alcohol based hand rub for a minimum of 20 s or by washing with soap and water for 40 seconds. Hand hygiene should be performed before and after using bathrooms, before and after making food or drinking, after sneezing, coughing or touching of mask.

2. What type of mask one should wear?
   Recently, there is advisory on the use of face cover or a mask made of cloths in the community to prevent spreading of the virus by the infected persons as these cloth masks do not have strong filters. N 95 masks and surgical masks are for healthcare providers who are working in different areas.

3. Hydroxychloroquine (HCQ) should be taken by the asymptomatic persons in the community as prophylaxis. No
   HCQ is prophylaxis should not be taken by the asymptomatic persons in the community as it is associated with adverse cardiovascular effect and the present evidence for its use is not strong.
   However, Indian Council of Medical Research (ICMR) recommends HCQ prophylaxis for health care provider in taking care of COVID positive patients, provided no cardiac risk factors are present.

4. ACE inhibitors should be discontinued in children as the mortality is high in COVID patients on ACE inhibitors. No
   All the major guidelines recommends to continue ACE/ARB inhibitors for hypertension as there is no clinical or scientific evidence to discontinue these drugs in COVID positive patients.

5. Immunosuppressants by discontinued in view of COVID 19 outbreak: No
   The patient should continue normal immunosuppressants, following social distancing and hand hygiene but should not go for prolonged self isolation.
   In case the patients develop symptoms of COVID 19, the steroids should not be stopped abruptly. Decisions to reduce or pause immunosuppressive therapy will need to be made on an individualized basis and in keeping with the treatment of other infectious diseases . Some patients with renal and autoimmune disease on high dose steroids, cyclophosphamide and biologics will be severely immunosuppressed and should be considered as high risk. There is no evidence to support that patients on induction immunosupressants be swabbed prior to therapy as early disease may have negative results in 30% of the cases. All patients should be triaged on arrival before any infusion to exclude symptoms of active COVID-19 infection and to check for raised temperature.
   In case the patient is receiving regular rituximab infusions, delaying interval between rituximab infusion should be considered, if the risk of relapse is low.

6. Faecal transmission of COVID 19 is major cause of transmission. No
   The primary mode of transmission is through droplet infections. There are studies that suggest fecal-oral transmissions. However, it is unlikely to be a major cause of transmission
In lighter vein

CON-Questing CO-RONA (during the COVID crisis)

The world metamorphosed in one month from 14th Feb 2020 as Valentine day to 14th March 2020 as QUARANTINE day. Made in China will no longer be duplicate as they have broken their own stereotype by manufacturing Covid 19 original. Adam and Eve ate an apple and we were born but the Chinese supposedly ate bat and we are dying!– Now, I have doubts whether drinking is safer and healthier than eating? Ironically people have consumed more alcohol for hands in last one month than mouth.

In these moments of Corona crisis I am sure you all have received umpteen guidelines for prevention and safety thanks to social media. With malls, schools, colleges, offices shut down every one is left with no choice but to be at home. After all we have to help flatten the covid curve at cost of our expanding waist curves sitting at home. So in these moments of home crisis I offer few guidelines to make your home stay bit easier and blissful.

1) “Tan” door majboor - lessen the social distancing at home unlike you usually keep distance!! Try to be in good books with your spouse after all right now she or he is your “hum suffer” in this Safar. And you both are “maid for each other” in the home covid crisis.

2) Try to know your children better-few dads who are addressed as” uncles” at home due to their guest appearances at home can take this opportunity to change their titles.

3) Rediscover your spouse- however do not even attempt to understand her better. And don’t get so friendly and bond so much that you tell her about all your girlfriends.

4) Husbands can enter new territory named kitchen. Wives can give TOTs (training) in cooking to husbands, also on home management and most crucial how to handle children. If he asks for scotch after dinner give him the Scotch-BRITE - after all few doctors who are fighting as frontline warriors are "vatan" ke vaste while some doctors are "bartan" ke vaaste.

5) Children can clean cupboards at least their own to begin with. Remind them that they have to earn their bread (pizza, pasta too) by helping in household chores.

6) If the family do not comply with your requests to help them take tips from our PM Modiji and call a meeting at 8 pm in your living room and just declare two things-
   a) Kitchen lockdown
   b) Internet lockdown

   And lo behold EUREKA ! they will compete to help you. Jo family se karate pyaar woh gharkam se kaise kare inkaar.

7) Family meal time can be restarted with fruitful (avoid nonveg -I meant jokes) dinner table conversations.

8) Let not gadgets come in the way of your family time remember mobile phones , laptops are potential sources for droplet infection for corona. Play cards, read books together, etc.

8) Try to know that your family members better after all they are nice people too.
9) Rekindle your passion with Diya jale sham dhale Sunday 5th April 9pm-for 9mins however take all precautions to avoid baby boom after 9 months (though we Paediatricians would be happy) be kind to your own self use “mankind” protection.

10) Avoid any arguments with your spouse for this may lead to stress in your body, which will reduce your immunity making you more susceptible to corona infection.

11) To avoid touching your face with hands keep your hands always full with something, grab whatever you may like, or hold two wine glasses in both hands, I bet you won’t touch anything anywhere.

12) While buying groceries and vegetables remember we are not locked down for eternity so buy as per your daily needs, I saw few women purchasing 25 whisper packets and 25 batteries (probably she thought she could charge her husband with that). Thank God Indians don’t use toilet paper.

13) Stop analysing and advising what the govt is doing. Learn from women- while the whole world is giving their unwanted perspectives on how to stop the corona spread they are busy going viral on Facebook with the sari challenge- posting a pic in sari. Even in these challenging times we are spreading cheer. Mind you covid 19 spreads the same way one infected person challenges 100 others!

14) Zara sa ZOOM Lu mein- Yes zoom has saved the Homo sapiens in these turbulent times of social distancing. Sitting in our cosy homes we are able to share Mann Ki baat with our friends or escalate our learning curve with digital IAP CMEs.

15) Let us not take too much pride that we taught” Namaste” to the world. After all USA and UK have taught us to work from home and work in the house sans any maids.

Yes NO mingling but it is still not that bad. We spend lifetime building our house and today when we have an opportunity to be at home ironically we are restless to get out of the same home!! The lockdown has taught us what “Freedom” is and how it feels to be caged like animals in a zoo.

Everything happens for a reason and we should always look at the glass half full. The world has come closer, international borders closed but differences forgotten, the pollution level has gone down, one can get up in the morning to birds chirping and not car honks, at last we have some time to stand and stare at the sky, sunsets, trees and flowers.

That we seek for happiness in restaurants, malls, theatres, gym, pubs but it’s all temporary. Probably we need to seek inside our own minds and in our hearts and in joy of small things. That we are so “privileged” that there is still milk in our house for tea, vegetables in our fridge, food on our plates, chocolates and cookies to indulge upon, movies and series on Netflix and Amazon-Prime to entertain us, to exercise inside our own homes and stay fit. It is sad that we needed a pandemic to make us realise all these things and a catalyst for a change. It might be or might not be a happy ending. The economy whether at individual level or capitalism at the national level might take months or years to recover. But remember there is always light at the end of the tunnel.

We need to practice the 4Rs at present-

**Resolve** - Let us resolve to help flatten the curve and co-operate together to fight and eradicate covid 19

**Resilient** - while every individual in this pandemic will be fighting his or hers own battle- some fighting on ventilator, some with spouse, some with boss, while some fighting for daily bread -
we need to maintain our stoic and resilience to help us sail through it. It’s a test of human fragility vs solidity.

**Return**- Eventually this will end and we shall return back to our routine life shaking hands, hugging friends, eating in restaurants and shopping in malls.

**Reform**- While there might be losses in terms of finances incurred to all be it private practice of doctors, hospital owners, business, tourism, national economy etc. we will all have to pave our way to restore, rebuild and reform- the home, the nation and the world.

Yes this too shall pass and it will end. One fine day we will get up, don our ties and saris and go to work. Probably this will fade like a nightmare after few months. Probably when we grow older we shall narrate the covid 19 stories and “quarantine folklore” to our grandchildren – of washing hands, wearing masks, tan-door, no maids, cleaning and scrubbing, but also of fears exposed, of dreams we painted, of hopes that kept us alive, of cheer we spread, of a small act of kindness we showed for the poor and underprivileged, of words of compassion to comfort someone. And yes we shall be the paediatricians to the “coronial” babies born during this period.

So laugh loud, fear less, help each other and we shall live more. And science together with prayers and faith shall uninstall this virus from our universe and reboot our system.
<table>
<thead>
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<th>Annexure 1</th>
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### COVID 19 RISK SCREENING TOOL 6th APRIL 2020

<table>
<thead>
<tr>
<th>SYMPTOMS</th>
<th>COVID 19</th>
<th>RISK</th>
<th>SCREENING</th>
<th>TOOL</th>
<th>6th APRIL 2020</th>
</tr>
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<tbody>
<tr>
<td>Fever</td>
<td>98.6-100°F</td>
<td>*100-102°F</td>
<td>*102-104°F</td>
<td>**&gt;104°F</td>
<td>**Severe</td>
</tr>
<tr>
<td>Cough</td>
<td>No</td>
<td>Mild</td>
<td>*Moderate</td>
<td>**Severe</td>
<td></td>
</tr>
<tr>
<td>Running nose</td>
<td>No</td>
<td>Mild</td>
<td>*Moderate</td>
<td>**Severe</td>
<td></td>
</tr>
<tr>
<td>Sore throat</td>
<td>No</td>
<td>Mild</td>
<td>*Moderate</td>
<td>**Severe</td>
<td></td>
</tr>
<tr>
<td>Body pain</td>
<td>No</td>
<td>Mild</td>
<td>*Moderate</td>
<td>**Severe</td>
<td></td>
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<tr>
<td>Loss of appetite</td>
<td>No</td>
<td>Mild</td>
<td>*Moderate</td>
<td>**Severe</td>
<td></td>
</tr>
<tr>
<td>Diarrhea</td>
<td>1-2 episode</td>
<td>3-5 episode</td>
<td>*5-7 episode</td>
<td>**&gt;7epi. in 24hrs</td>
<td></td>
</tr>
<tr>
<td>Lost sense of smell &amp; taste</td>
<td>No</td>
<td>Mild</td>
<td>*Moderate</td>
<td>**Severe</td>
<td></td>
</tr>
<tr>
<td>Difficulty in breathing</td>
<td>Easily holds breath-10sec</td>
<td>*Mild on climbing stairs</td>
<td>**Moderate on walking</td>
<td>**Severe even in sitting &amp; resting</td>
<td></td>
</tr>
<tr>
<td>Persistent pain/pressure in chest</td>
<td>No</td>
<td>**Mild</td>
<td>**Moderate</td>
<td>**Severe</td>
<td></td>
</tr>
<tr>
<td>Bluish lips &amp; face</td>
<td>No</td>
<td>**Mild</td>
<td>**Moderate</td>
<td>**Severe</td>
<td></td>
</tr>
<tr>
<td>Confusion/Fatigue</td>
<td>No</td>
<td>**Mild</td>
<td>**Moderate</td>
<td>**Extreme</td>
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</table>

### HIGH RISK MEDICAL COMORBIDITY

<table>
<thead>
<tr>
<th>OTHER MEDICAL CONDITIONS</th>
<th>RISK</th>
<th>MEDICAL</th>
<th>COMORBIDITY</th>
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<tbody>
<tr>
<td><strong>SAM &amp; blood disorders</strong></td>
<td></td>
<td></td>
<td><strong>Immuno compromised</strong></td>
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<tr>
<td><strong>Pregnancy Perinatal</strong></td>
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<tr>
<td><strong>High BP + Diabetes</strong></td>
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</tr>
<tr>
<td><strong>High BP</strong></td>
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</tr>
<tr>
<td><strong>Chronic lung disease</strong></td>
<td><strong>Chronic heart disease</strong></td>
<td><strong>Chronic liver disease</strong></td>
<td><strong>Chronic kidney disease</strong></td>
</tr>
<tr>
<td><strong>More than 14 days</strong></td>
<td></td>
<td><strong>Less than 14 days</strong></td>
<td></td>
</tr>
<tr>
<td><strong>5-15 yrs</strong></td>
<td></td>
<td><strong>0-5 yrs</strong></td>
<td><strong>50y+ comorbid</strong></td>
</tr>
</tbody>
</table>

**NO RISK**: REASSURE / STAY SAFE

**LOW RISK**: Tt. AT PHC/ OPD/ REFER

**HIGH RISK**: 1. ANY SINGLE SYMPTOM** 2. COMORBIDS WITH ANY SYMPTOM* 3. CONTACTS

**INSTRUCTIONS**: 1. FIRSTLY CHECK FOR SYMPTOMS (1-12) TICK IN BOX IF PRESENT. IF ANY ONE PRESENT TICK REMAINING BOXES 2. ANY SINGLE TICK IN RED BOX CLASSIFY AS HIGH RISK & ANY SINGLE TICK IN YELLOW BOX CLASSIFY AS LOW RISK EVEN IF REMAINING ARE NO RISK. 3. THIS SCREENING TOOL WILL HELP PRIMARY HEALTH CARE PROVIDER TO PRIORITISE PATIENTS WHOM TO GIVE TREATMENT (* LOW RISK ) & WHOM TO REFER TO HIGHER CENTER FOR APPROPRIATE QUARANTINE & MANAGEMENT (**HIGH RISK**). 4. THIS SIMPLE SCREENING TOOL MAY ALSO HELP NON MEDICAL PERSONS & FAMILIES TO DECIDE WHEN TO CONSULT

**NOTE**: This will be reviewed & revised according to updates coming up at mohfw.gov.in & GOI website

**COMPILED & PREPARED BY GWALIOR ACADEMY OF PEDIATRICS**
Annexure 2  
INDIAN COUNCIL OF MEDICAL RESEARCH  
DEPARTMENT OF HEALTH RESEARCH  

Date: 15/04/2020

Total Operational (initiated independent testing) Government Laboratories reporting to ICMR 176 + 3 collection sites:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Names of States</th>
<th>Names of Medical Colleges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Andhra Pradesh</td>
<td>1. Sri Venkateswara Institute of Medical Sciences, Tirupati</td>
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<tr>
<td></td>
<td>(7)</td>
<td>2. Rangaraya Medical College, Kakinada</td>
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<td>3. Sidhartha Medical College, Vijaywada</td>
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<td></td>
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<td>4. Govt. Medical College, Ananthpur</td>
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<td>5. Guntur Medical College, Guntur</td>
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<tr>
<td></td>
<td></td>
<td>6. Rajiv Gandhi Institute of Medical Sciences, Kadapa</td>
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<tr>
<td></td>
<td></td>
<td>7. Andhra Medical College, Visakhapatnam</td>
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<tr>
<td>2.</td>
<td>Assam (5)</td>
<td>8. Gauhati Medical College, Guwahati</td>
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<tr>
<td></td>
<td></td>
<td>9. Regional Medical Research Center, Dibrugarh</td>
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<tr>
<td></td>
<td></td>
<td>10. Jorhat Medical College, Jorhat</td>
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<td></td>
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<td>11. Silchar Medical College, Silchar</td>
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<td>12. Fakhruddin Ali Ahmed Medical College, Barpeta</td>
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<td>3.</td>
<td>Bihar (5)</td>
<td>13. Rajendra Memorial Research Institute of Medical Sciences, Patna</td>
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<td>14. Indira Gandhi Institute Medical Sciences, Patna</td>
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<td>15. Patna Medical College, Patna</td>
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<td>16. Darbhanga Medical College, Darbhanga</td>
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<td>17. SKMCH, Muzaffarpur</td>
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<td></td>
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<td>18. All India Institute of Medical Sciences, Patna</td>
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<td>Chandigarh (2)</td>
<td>19. Post Graduate Institute of Medical Education &amp; Research, Chandigarh</td>
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<td>20. Govt. Medical College, Chandigarh</td>
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<td>Chhattisgarh (3)</td>
<td>21. All India Institute of Medical Sciences, Raipur</td>
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<td>22. Late Baliram Kashyap M Govt. Medical College, Jagdalpur</td>
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<td>23. JNM Medical College, Raipur</td>
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<td>6.</td>
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<td>24. All India Institute Medical Sciences</td>
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<td>25. Lady Hardinge Medical College</td>
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<tr>
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<td>26. National Centre for Disease Control</td>
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<td>27. Ram Manohar Lohia Hospital</td>
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<td>28. Institute of Liver &amp; Biliary Sciences</td>
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<td>29. Army Hospital Research &amp; Referral</td>
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<td>30. Maulana Azad Medical College</td>
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<td>31. Vardhman Mahavir Medical College &amp; Safdarjung Hospital</td>
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<td>32. BJ Medical College, Ahmedabad</td>
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<td>33. MP Shah Govt Medical College, Jamnagar</td>
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<td>34. Govt. Medical College, Surat</td>
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<td>37. Govt. Medical College, Rajkot</td>
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<td>38. NHL Medical College, Ahmedabad</td>
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<td>39. GMERS, Ahmedabad</td>
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<td>40. National Institute of Occupational Health, Ahmedabad</td>
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<td>S. No.</td>
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<td>Names of Medical Colleges</td>
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<td>ESIC Hospital, Faridabad</td>
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<td>Kalpana Chawla Govt. Medical College, Karnal</td>
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<td></td>
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<td>*ICAR-National Research Centre on Equines, Hisar</td>
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<td>Command Hospital (NC) Udampur</td>
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<td>Patliputra Medical College &amp; Hospital, Dhanbad</td>
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<td>Mysore Medical College &amp; Research Institute, Mysore</td>
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*CSIR/DBT/DST/DAE/ICAR/DRDO Labs. No support is sought from ICMR/ State Govt.*