विज्ञान प्रसार
VIGYAN PRASAR
An Autonomous Organization of
Department of Science & Technology,
Government of India

COVID-19

Science & Technology Efforts in India

UPDATED FORTNIGHTLY

28TH JUNE 2021

In the face of adversity we have a choice-
stay updated with scientific facts

VOL. IV | ISSUE 5

DISCLAIMER

Contents in this e-Newsletter are for information purposes only and have been made available in public by the relevant department/organisation.

In case of any variance between what has been stated and that contained in the relevant document, the latter shall prevail.

Unless otherwise specifically stated, the information contained herein is made available to the public for information purposes only.

Although we have made the best effort to keep the information updated, the accuracy, completeness or adequacy of information will depend on what is made available by the third party or the same being up-to-date.

This will depend on the availability of the same. The e-Newsletter is continuously evolving and the aggregation of information is an unceasing process.

The process requires the co-operation of and synergy with all stakeholders.

PREFACE

At present, the country is exhibiting an unassailable resolve to overcome the crises created by the COVID pandemic. The second wave of the pandemic, which has tested our patience and the extent to which we can tolerate the grief is subsiding, life has started crawling back to normalcy. But COVID discipline and appropriate behaviours need to be followed with utmost vigilance.

We continue with compiling new information every fortnight on the pandemic to remain aware of the latest developments. The aim is to inform the readers and strengthen the usefulness of the information. This edition contains compilation and coverage of information related to funding opportunities, industry partnerships, capacity enhancement of medical oxygen, start-up spotlights, research contributions, community outreach, fact-checks, and so on, with new functionalities on the inner pages for better user perspective. For all the sections, a section guideline has been provided and hyperlinked with the respective locations.

Hopefully, the coverage about how the country is overcoming challenges with the help of knowledge will instil in you a confidence and trust in the country's scientists and scientific administrators that would ultimately result in inculcating scientific temper. Together we can and we will beat the pandemic out, with the collective strengths and spirit of services as the backbones.

We wish an engaging reading to our audiences across all strata of the society and look forward to their suggestions and feedback at covidnewsletter@vigyanprasar.gov.in. Additionally, feedback questionnaires have been included and a link has been provided for submission. This, in turn, would help our readers in finding desired and more relevant compiled information.

28 June 2021

Vigyan Prasar

New Delhi

The older issues of e-newsletter are available in the Archival Section at https://vigyanprasar.gov.in/covid19-newsletters/

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The e-newsletter is being published on a regular basis by collating all the inputs received till the preceding day of the release.

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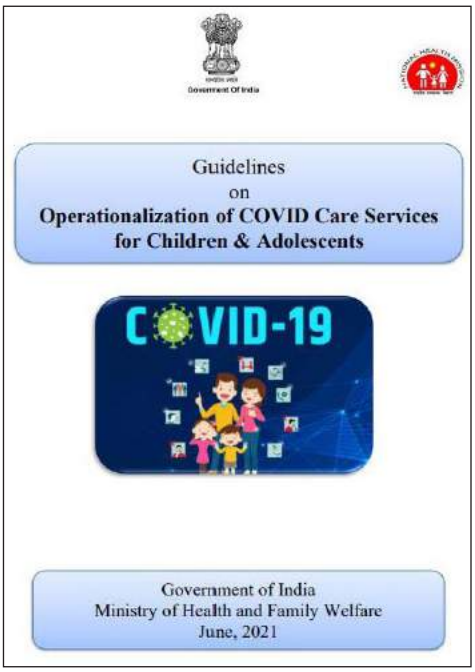
INFORMATION OF IMMEDIATE USAGE

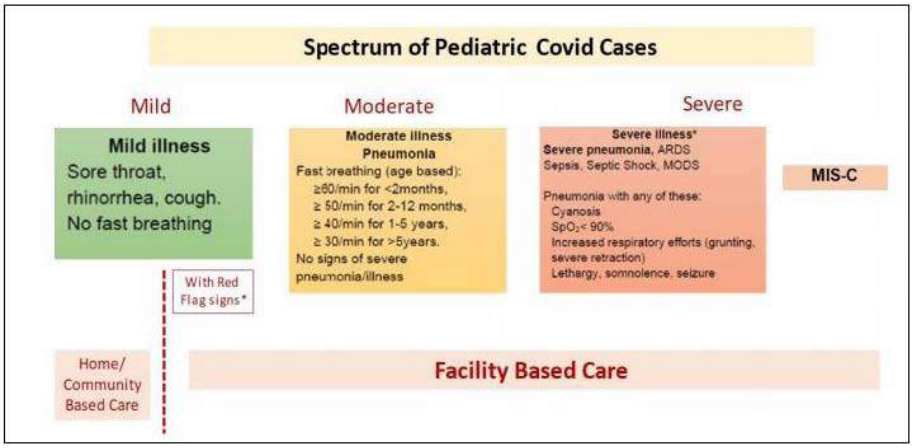
The up-to-date information related to guidelines, standard operating procedures (SOPs), regulations, etc., released by various apex bodies, government departments and ministries are compiled here in a ready-to-use manner. Reference links and contact information are made available wherever possible.

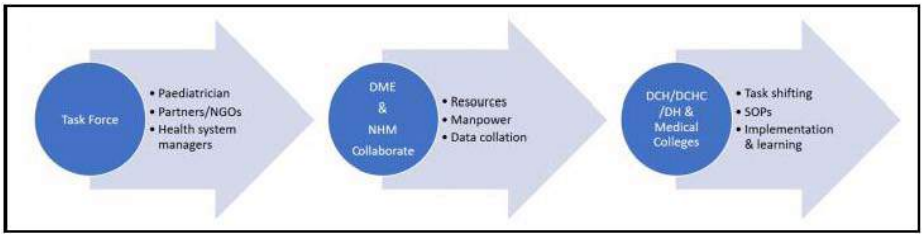
SECTION GUIDELINES

MoHFW guidelines on Operationalization of COVID Care Services for Children & Adolescents

Ministry of Health and Family Welfare (MoHFW) released guidelines on operationalization of COVID care services for children and adolescents. The guideline states that it is desirable to designate specific areas in the COVID facilities for paediatric care. These facilities should allow parents to accompany the child. It also says that, it is desirable to augment the existing COVID care facilities to provide care to children with acute complications. This will need additional paediatric-specific equipment, infrastructure and paediatric formulations. Also, adequate number of trained manpower - both doctors and nurses - should be provided. The health authorities should initiate capacity building programmes for appropriate paediatric care. In standalone paediatric hospitals, separate arrangements, for example, separate bed for paediatric COVID care need to be established. The document also provides guidance about for children with MIS-C. Care has to be provided by the existing paediatric facilities for children who test negative for acute COVID. These facilities also need augmentation, especially HDU and ICU services.





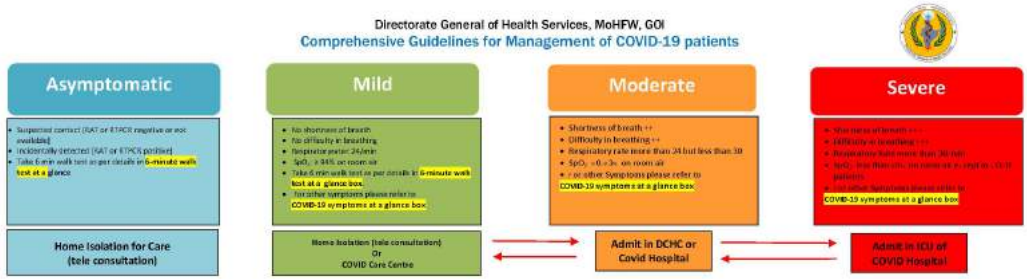


Website Link:

https://www.mohfw.gov.in/pdf/GuidelinesonOperationalizationofCoVIDCareServicesforChildrenandAdolescents14062021.pdf

DGHS releases comprehensive guidelines for management of COVID-19 patients

Directorate General of Health Services, MoHFW, GOI has released Comprehensive Guidelines for Management of COVID-19 patients. In this document, the possible symptoms, signs and findings have been enlisted; and patients in each category may have one or many of these. Further, based on the categories mainstay treatment, COVID-appropriate behaviour, medications, investigations, Dos/Don'ts etc. are charted out along with guidance for self-monitoring of important health parameters SpO2, pulse rate, etc. This comprehensive guidelines also contain self-monitoring proforma guide box, Drug Therapy Guide Box, Use of steroids and anti-coagulants guide box, COVID-19 Treatment/What-to-do at a glance box, EUA/Off Label Drugs use at a glance box, Rational use of HRCT imaging Guide Box, Managing Mucormycosis Guide Box and procedure for 6-minute walk test at a glance box.

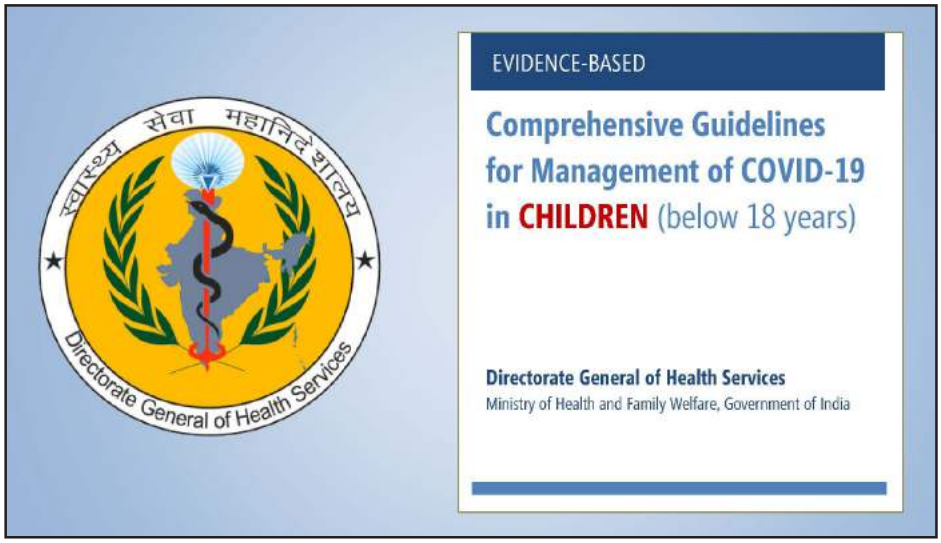


Website Link:

https://www.dghs.gov.in/WriteReadData/News/2021052704360277703 48ComprehensiveGuidelinesforManagementofCOVID-1927May2021DteGHS.pdf

Comprehensive Guidelines for Management of COVID-19 in Children released by DGHS

Directorate General of Health Services (DGHS), MoHFW, GOI has recently released comprehensive guidelines for Management of COVID-19 in Children (below 18 years). In these guidelines, the possible symptoms, signs, and findings have been discussed and children in each category may have one or many of these. Further, based on the categories mainstay treatment,



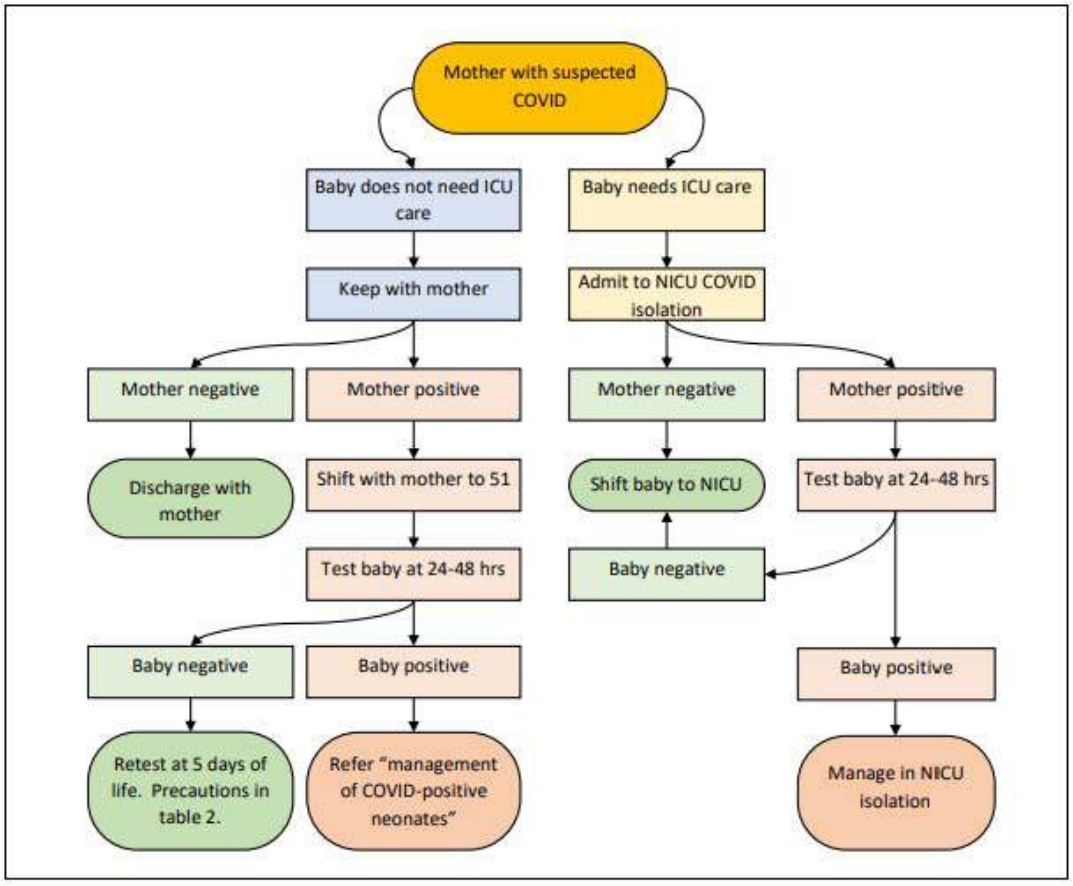
COVID-appropriate behaviour, medications, investigations, Dos/Don'ts etc. are charted out along with guidance for self-monitoring of important health parameters SpO_2, RR, etc. This comprehensive guidelines also contain Acute Respiratory Distress Syndrome (ARDS) and Shock management guide, 6-minute walk test procedure at a glance box for children above 12 years under supervision of parents/guardian, Multisystem Inflammatory Syndrome (MIS-C) management guide, Suggested proforma for monitoring in children, infection prevention and control (IPC) and what-to-do at a glance, antimicrobial use guide, use of steroids and anti-coagulants guide, rational use of HRCT imaging guide, mucormycosis guide, etc.

Website Link:

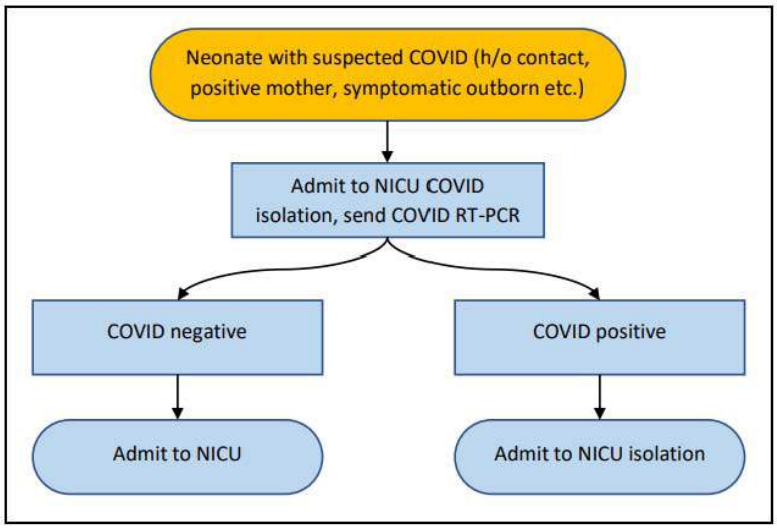
https://www.dghs.gov.in/WriteReadData/News/2021060903372789324 02DteGHSComprehensiveGuidelinesforManagementofCOVID-19inCHILDREN_9June2021.pdf

JIPMER brings forth COVID-19 SOP on Neonates

Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), an Institution of National Importance under the Ministry of Health & Family Welfare had issued a COVID-19 Standard Operating Procedure (SOP) for Neonates. The objective of this SOP is to understand the current evidence regarding SARS-CoV-2 infection in neonates and to outline the management of neonates with suspected or conformed COVID-19.



Management of infants born to a mother suspected to have COVID-19



Management of infants suspected to have COVID-19

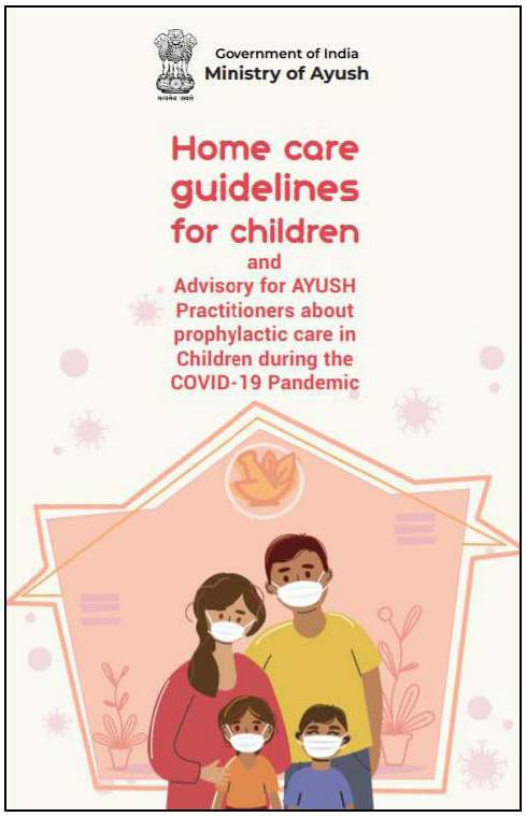
Contact Info:

covid19jipmer@gmail.com

Website Link:

https://covid19jipmer.org/sops-for-covid-19/#1598967405435-d1757dac-4c6a

Ministry of AYUSH releases Home Care Guidelines for children for prophylactic care during COVID-19 pandemic



In the initial phase of COVID-19 pandemic mostly adults and elderly people were affected. But in the second wave of the infection, incidences in children are increasing alarmingly. However, the infection is generally mild in children than in adults and most of the children may not require any specific treatment. However, children who are having a history of medical co-morbidity like obesity, Type-1 diabetes, chronic cardiopulmonary disease, or in immune-comprised position may be at higher risk. It has been observed that the prophylaxes are the best approach to save children from this deadly virus. In various studies conducted so far, few Ayurveda medicines including of other systems of AYUSH have shown their efficacy in prophylaxis of COVID-19.

Though the immunity of children is quite strong but with many mutant virus strains emerging, it is necessary to follow all protocols related to COVID-19 to prevent its effect. Children fall under most vulnerable group of the population. In contrary to the adults, it is very difficult to

plan for various preventive and management strategies in children due to their wide age range and anatomical, physiological, immunological and psychological differences. This protocol will provide understanding of approach for care of children at home and support parents, caregivers and practitioners to take care of children during the pandemic.

Website link:

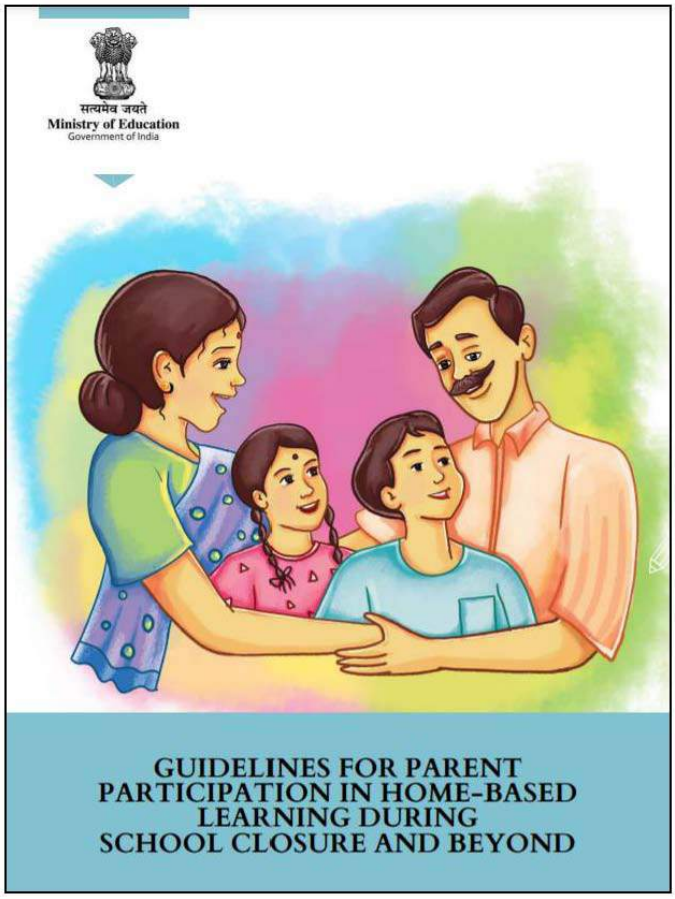
https://main.ayush.gov.in/event/home-care-guidelines-children-and-advisory-ayush-practitioners-about-prophylactic-care

Guidelines issued by Ministry of Education for parent participation in home-based learning during school closure and beyond

The Department of School Education and Literacy, Ministry of Education released the Guidelines for Parent Participation in Home-based Learning during school closure and beyond.

The guidelines on home-based learning emphasize on the need for parents to create a safe and engaging environment and a positive learning environment, have realistic expectations from the child, take care of health and eat healthy, while at the same time having fun with children. These guidelines are meant not only for parents but also for caregivers, other family members, grandparents, community members, and older siblings who all are engaged in promoting the welfare of children.

The guidelines provide many simple tips for parents and others to facilitate children in home-based learning. These suggestive activities are in accordance with the various stages of school



education as per NEP 2020. Age-appropriate art activities have been categorized on basis of 5+3+3+4 system via Foundation Stage (Age 3-8 years); Preparatory Stage (Age 8-11 years); Middle Stage (Age 11-14 years); and Secondary Stage: From Adolescent to Adult age (Age 14-18 years). The activities are simple and suggestive, which can be adapted and adopted to local needs and contexts. The Guidelines appreciate the role of Art as a therapy for children under stress or trauma.

The Guidelines lay significance on improving children's learning by monitoring and addressing their learning gaps. Collaboration of parents with teachers in documenting and reflecting on the progress that children are making in their learning is important for both teachers and parents.

The Guidelines also advise the schools to involve parents by providing information and ideas on helping students at home with homework and other curriculum-related activities, decisions, and planning, and involving them in school decisions. Resources like sending Newsletters, emails, memos, etc. may be provided to parents.

Resources have been made available for children with special needs which may be explored by the parents. They can approach teachers for guidance in this regard. There are other agencies, and organizations that provide information about such avenues that could be sought from SMCs/Gram Panchayat, school administrators etc.

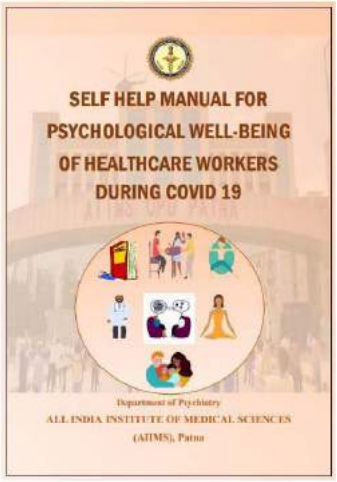
A separate chapter has been included in the Guidelines for supporting parents with low/no literacy. Schools, teachers and volunteers may take the suggestive steps to provide support to such parents.

Website link:

https://dsel.education.gov.in/sites/default/files/update/MoE_Home_Learning_Guidelines.pdf

AIIMS-Patna issued Self-help Manual for psychological well-being of healthcare workers during COVID-19

AIIMS Patna has issued a practical and simple self-help manual to provide psychological first aid services for the healthcare workers along with the helpful tips and techniques. This manual discusses in detail techniques to Identify and manages stress, burnout, anxiety, depression, and grief. It further includes self-care tips to manage mental health at home and also explains when and where to seek help from a professional.

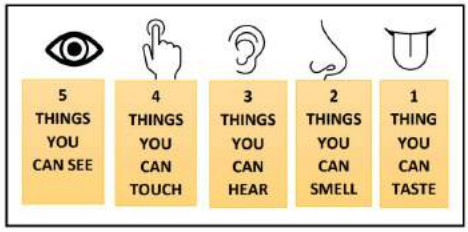


Contact Info:

aiimspatnapsychiatry@gmail.com

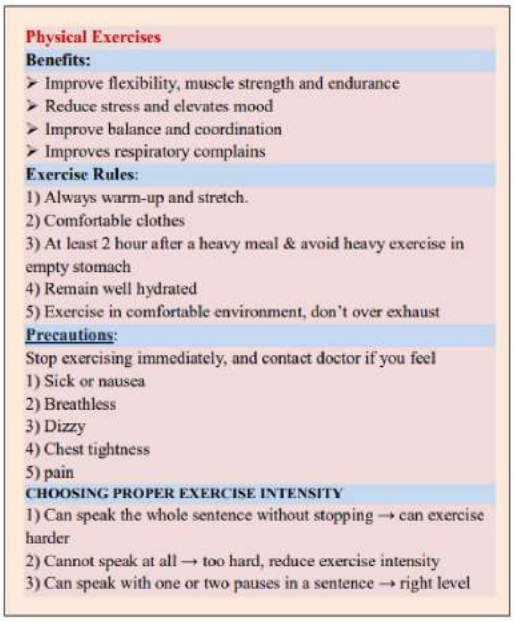
Website link:

https://www.aiimspatna.org/advertisement/SELF%20HELP%20MANUAL_%20HEALTH_CARE_WORKER11062021.pdf



Information booklet for rehabilitation of post-COVID-19 patients by AIIMS-Patna

All India Institute of Medical Science (AIIMS) Patna has released an information booklet for the rehabilitation of post-COVID-19 patients. This guideline discusses in detail how to tackle the problems associated with COVID-19 infection, to improve quality of life, to avoid short- and long-term complications after COVID-19 infection, to prevent new comorbidity and to hasten recovery.



Website Link:

https://www.aiimspatna.org/advertisement/Information%20Booklet%20for%20rehabilitation%20of%20post%20covid%2019%20patients.pdf

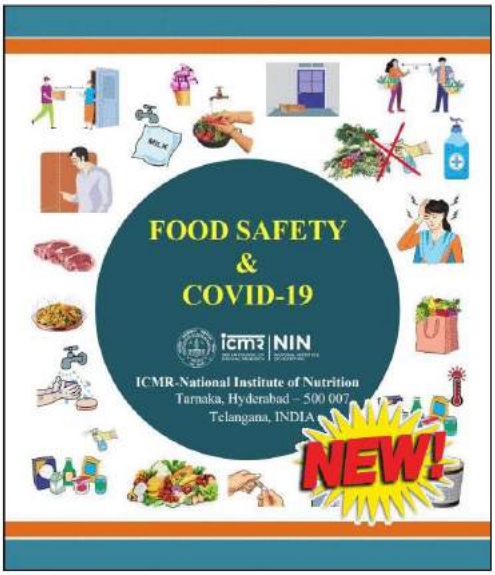
Food Safety & COVID-19, guidelines issued by ICMR-National Institute of Nutrition

There is no evidence that COVID-19 disease transmits through food. The main risk arises in case of human-to-human transmission during food handling, from close contact with infected food handlers. COVID-19 may get transmitted through surface of food packaging material containing droplets of infected food handlers. These can be avoided by maintaining good hygienic practices.

In view of this, National Institute of Nutrition (NIN) issued guidelines for public in which precautions are mentioned that should be taken during COVID-19 for food items. The precautions are divided within different areas which are described as follow:

1. When purchasing food;
2. When handling food;
3. When ordering food from delivery platforms; and
4. When preparing food.

Guidelines are also mentioned on food habits in the form of frequently asked questions (FAQs) for general public or consumer audience during COVID-19.



Frequently Asked Questions (FAQs)

FAQs	RESPONSES
Does COVID-19 infection spread through food?	There is no evidence to date of viruses that cause respiratory illnesses being transmitted via food or food packaging. Corona virus need living host either animal or human for its multiplication
Does eating meat cause COVID-19 infection?	No. There is no scientific evidence to prove that COVID virus can spread through meat. However, meat should be cooked thoroughly and safe handling practices must be followed before its consumption.
Does eating garlic, ginger prevent COVID-19 infection?	There is no scientific evidence to prove that eating garlic, ginger prevent COVID-19 infection. However, they are known to have compounds that can improve immune function
Does eating ice cream and frozen foods spread corona virus infection?	There is no scientific evidence to prove that eating ice creams and frozen food spreads corona virus infection.
Does COVID-19 spread from a food worker handling my food?	A sick person should not cook or handle food. If the food handler is sick and you come in close contact with the person, you may be vulnerable
Do probiotics help prevent COVID-19?	Probiotics are live microorganisms, which help improve gut health and immune function. However, there is currently no evidence to support the use of probiotics to prevent or cure COVID-19
Can adding pepper to your soup or meal prevent COVID-19?	No. There is no evidence that adding hot peppers to your food can prevent or cure COVID-19
Do herbal teas or herbal supplements prevent or cure COVID-19?	There is currently no evidence to support this
Can micronutrient (vitamin and mineral) supplement prevent or cure COVID-19?	There is not enough evidence to come up with any guidance on micronutrient supplementation for prevention of COVID-19 in healthy individuals or for treatment of COVID-19. Micronutrients, if consumed from food sources like fruits, vegetables, nuts and whole grains can play an important role in well-functioning immune system and play a vital role in promoting health

Link to the Guidelines:

https://www.nin.res.in/covid_19/Food%20safety%20and%20COVID-19%2021-5-21.pdf

ICMR issues guidelines to enhance availability of COVID-19 testing kits and newer innovative testing solutions in India

ICMR released guidelines to enhance availability of COVID-19 testing kits and newer innovative testing solutions in India. In its advisory dated 27.04.2021, ICMR had advised that real time RTPCR, RAT, home-based testing solutions, antigen/antibody ELISA/CLIA and rapid antibody tests approved by European CE/IVD, Ministry of Food and Drug Safety, Korea, PMDA, Japan, TGA, Australia, Brazil ANVISA and WHO Emergency Use Listing (EUL) procedure may be exempted from validation in India and accorded marketing permission by Drug Controller General of India (DCGI) on the basis of existing approvals.

Now this advisory is modified in consultation with the DCGI. Earlier a sizeable number of different test kits, approved by certain external agencies, could not meet the validation criteria laid down in India. However, such kits became eligible to enter the Indian market without any improvisation/revalidation.

In view of this, SARS-CoV-2 RTPCR, RAT, Antigen/Antibody ELISA/CLIA and Rapid Antibody tests approved only by the following agencies will not require separate validation in India:

1. United States Food and Drug Administration (USFDA), USA;
2. Pharmaceuticals and Medical Devices Agency (PMDA), Japan;
3. Therapeutic Goods Administration (TGA), Australia; and
4. WHO Emergency Use Listing (EUL) procedure.

This guidance is applicable for tests using nasopharyngeal, oropharyngeal, throat, nasal, oral, saliva, mouth rinse, gargle, blood and serum samples.

Contact Info:

drneetu.vijay@icmr.gov.in, ajaysinghdhama@gmail.com

Website Link:

https://www.icmr.gov.in/pdf/covid/kits/Guidance_COVID_testing_commodities_18062021.pdf

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COVID 2.0 FUNDING

The funding opportunities, like Calls For Proposals (CFPs), Expressions of Interests (EoIs), research grants, start-up grants, and so on, are compiled here for the usage of interested individuals, institutions, entrepreneurs, start-ups and industries, as a one-stop ready reckoner. Reference links – for more information, how to apply and contact information – are made available wherever possible for further connecting to the desired stakeholders with one another.

SECTION GUIDELINES

ICMR invites expression of interest for validation of rapid antigen detection assays for COVID-19

ICMR calls for research proposals to support innovative research ideas

ICMR invites expression of interest for validation of rapid antigen detection assays for COVID-19

ICMR invites applications for validation of rapid antigen detection tests for COVID-19 from all manufacturers who have developed rapid antigen test (RAT) kits. Requirements for validations are based on various categories, like first-time validation, revalidation, and validation with alternate sample types.

The gold standard RT-PCR diagnostic test for COVID-19 has limitations in terms of widespread availability. In view of this, there is urgent requirement of reliable and convenient rapid point-of-care antigen detection assays with high sensitivity and specificity. Such assays could be used as potential diagnostic tests in all possible public and private healthcare settings and made available for mass testing.

Deadline: Open till next announcement

Contact Info:

guptanivedita.hq@icmr.gov.in, drneetu.vijay@icmr.gov.in

Website Link:

https://www.icmr.gov.in/pdf/tender/Revised_EOI_for_Ag_kit_validation_22052021_v1.pdf

ICMR calls for research proposals to support innovative research ideas

The COVID-19 pandemic has led to major loss of lives and livelihood. Despite intense efforts of the global scientific community, there is scanty knowledge related to the functional aspects of the virus, its transmission dynamics, immunological response to natural infection, and vaccines. In addition, it is important to understand the drivers of vaccine hesitancy and reduced uptake, clinical spectrum of the disease and its progression. Also, there is a need to formulate the clinical management protocols in line with the emerging global evidence.

ICMR had initiated research on COVID-19 in Task Force and intramural mode. These projects were formulated to address the most pressing research questions in the following domains: Clinical Research; Diagnostics & Biomarkers; Epidemiology & Surveillance; and Operations Research.

ICMR now invites independent researchers all across the country to contribute to the scientific knowledge related to COVID-19 by submitting their innovative research ideas as brief concept proposals in Epidemiological and surveillance studies, Laboratory studies, Immunological aspect and vaccine efficacy research, Clinical research, Socio-behavioural research, and Policy studies. All concept proposals will be screened at ICMR. If approved by the screening committee, selected investigators will be requested to submit full proposals.

The user manual of e-PMS is available at https://epms.icmr.org.in

Deadline: 30th June 2021

Contact Info:

po.epms@icmr.gov.in

Website Link:

https://main.icmr.nic.in/sites/default/files/whats_new/ICMR_Call_for_Proposal_COVID19_01062021.pdf

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3

CAPACITY ENHANCEMENT OF MEDICAL OXYGEN

The impact of the second wave of COVID pandemic has seen a shortage of medical oxygen across the nation. The section contains the compiled information related to efforts, initiatives, and contributions taken up by various agencies, industries, and so on.

SECTION GUIDELINES

ISRO-VSSC develops SHWAAS, oxygen concentrator to support India's battle against COVID-19

PROJECT O2 for INDIA initiative facilitated by Office of the PSA

ISRO-VSSC develops SHWAAS, oxygen concentrator to support India's battle against COVID-19

Vikram Sarabhai Space Centre (VSSC), which is the lead body of the Indian Space Research Organisation (ISRO) under the Department of Space (DOS), has developed an oxygen concentrator to save more lives across India during this deadly second wave of the coronavirus pandemic.

The Medical Oxygen Concentrator (MOC) – named SHWAAS – can deliver enriched level (>95%) of oxygen to support patients with respiratory illness or who are on oxygen therapy. The device enhances the oxygen gas content by selectively separating the nitrogen gas from ambient air through Pressure Swing Adsorption (PSA). SHWAAS is capable of supplying enriched oxygen continuously at the rate of 10 LPM, which is adequate for two patients at a time.

Specifications

- Rated power: 600 Watt
- Operating voltage: 220 V/50 Hz
- Oxygen flow: 0.5 – 10 LPM (Controllable)
- No. of Oxygen Outlets: 2
- Oxygen concentration: 82 % minimum (95% nominal)
- Outlet Oxygen pressure: 50 – 80 kPa
- Alarm: Audible alarm for low purity, low & high levels of Pressure and Flow rate of Oxygen
- Noise: ≤ 60 dB
- Net weight: 42-44 kg
- Dimensions: 600 mm H x 500 mm L x 400 mm W
- LCD display: Oxygen Concentration, Flow rate, Pressure

Contact Info:

ttic@vssc.gov.in, vtrobin@gmail.com

Website link:

https://www.isro.gov.in/capacity-building/technology-transfer-of-medical-oxygen-concentrator

PROJECT O_2 for INDIA initiative facilitated by Office of the PSA

The second wave of COVID-19 saw an increase in demand for medical oxygen in different parts of the country. While meeting the current demand, manufacturing medical oxygen also became important to ensure adequate supply in the future. 'Project O_2 for India' run by the Office of Principal Scientific Adviser, Government of India, is to enable stakeholders working to augment the country's ability to meet this rise in demand for medical oxygen.

Under Project O_2 for India, the National Consortium of Oxygen is enabling the national level supply of critical raw materials such as zeolites, setting up of small oxygen plants, manufacturing compressors, final products, i.e., oxygen plants, concentrators, and ventilators. The Consortium is not only looking forward to providing immediate to short-term relief but also working to strengthen the manufacturing ecosystem for long-term preparedness. A committee of experts has been evaluating critical equipment such as oxygen plants, concentrators, and ventilators from a pool of India-based manufacturers, start-ups, and MSMEs (in partnership with FICCI, MESA, etc.). The manufacturing and supply Consortium also includes Bharat Electronics Limited (BEL); Tata Consulting Engineers (TCE); C-CAMP, Bengaluru; IIT Kanpur (IIT-K); IIT Delhi (IIT-D); IIT Bombay (IIT-B), IIT Hyderabad (IIT-H); IISER, Bhopal; Venture Center, Pune; and more than 40 MSMEs.

The Consortium has started to secure CSR/philanthropic grants from organizations like USAID, Edwards Life sciences Foundation, Climate Works Foundation, etc. Hope Foundation, American Indian Foundation, Hitachi, BNP Paribas, and eInfoChips are procuring oxygen concentrators and Vacuum Pressure Swing Adsorption/Pressure Swing

Adsorption (VPSA/PSA) plants as part of their CSR efforts to aid the Consortium's work. NMDC Ltd has agreed to fund the procurement of raw materials like zeolite for the manufacturers in the Consortium.

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vibhor.bansal@investindia.org.in, sapna.poti@gov.in

Website link:

https://pib.gov.in/PressReleasePage.aspx?PRID=1726727

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4

INDUSTRY PARTNERSHIPS

The information related to contributions from industries, their timely pitching-in and joining the warfare against mitigating the COVID pandemic is provided here to sensitize the larger group of the community. The section includes the contractual obligations and commitments by industries with Government's Apex Agencies, with certain responsibilities liable at both ends..

SECTION GUIDELINES

CSIR and Tata MD partner to make COVID-19 detection more accessible across India by harnessing network of CSIR labs

CSIR in partnership with Laxai Life Sciences received regulatory approval to undertake clinical trials with Colchicine on COVID-19 patients

CSIR and Tata MD partner to make COVID-19 detection more accessible across India by harnessing network of CSIR labs

The Council of Scientific and Industrial Research (CSIR), India's apex scientific research organisation and Tata MD, the new healthcare venture from the Tata Group have announced a significant partnership to ramp up the COVID-19 testing capacity across Tier II and III towns as well as rural areas across India. CSIR and Tata MD are developing this capacity to manage any future surge in the COVID-19 testing requirements.

The initiative will utilise CSIR's network of labs across India and help increase India's testing capacity in smaller locations in the country. CSIR and Tata MD will jointly develop the testing capacity, and the RT-PCR CRISPR test will be done using the Tata MD CHECK SARS-CoV-2 test kits that are powered by FELUDA technology from CSIR-IGIB.

"Apart from vaccination, rapid testing and isolation of SARS-CoV-2 positive persons has emerged as the best strategy in combating COVID-19. This initiative in partnership with Tata MD to deploy the RT-PCR CRISPR test across multiple CSIR labs spread across the country is an important step. This will augment the national capacity to test for COVID and detect it locally," said Dr Shekhar C Mande, Director General, CSIR.

Tata MD is also deploying a proprietary 3-room design mobile testing lab that can conduct end-to-end, on-site COVID-19 testing to increase the testing capacity in the state.

"By partnering with CSIR's network of labs and deploying fully equipped mobile laboratories, we are confident that we can quickly augment testing capacity using faster and scalable methods. This will significantly enhance the ability of state and district administrations to ensure wider availability and easier access to testing on an on-going basis," said Girish Krishnamurthy, CEO and MD of Tata Medical and Diagnostics.

Significantly, 13 CSIR labs have been engaged in carrying out RT-PCR testing during the COVID-19 pandemic and this partnership between CSIR and TATA-MD is aimed at expanding the testing capacity further over the next few months by deploying the TATA-MD CHECK testing via the vast network of 37 CSIR labs spread across the country from CSIR-IIIM in Jammu in North to CSIR-NIIST in Thiruvananthapuram in South and CSIR-CSMCRI, Bhavnagar in West to CSIR-NEIST Jorhat in North-East.

The first CSIR lab to go live with Tata MD is located at CSIR-Indian Institute of Petroleum (IIP), Dehradun, Uttarakhand. Commenting on the development, Dr Anjan Ray, Director

CSIR-IIP, said, "We are happy that CSIR-IIP is the first CSIR lab to launch this initiative and the current testing capacity will be 800 daily tests that can be scaled up using the Tata MD CHECK automation solution if demand rises significantly."

Tata MD provides an end-to-end and reliable COVID-19 testing solution in following versions:

- Tata MD CHECK SARS-CoV-2 test: A paper strip-based RT-PCR CRISPR test powered by FELUDA from CSIR-IGIB, which has been approved by ICMR and is simple with high accuracy and requires standard laboratory equipment like thermocyclers.
- Tata MD Automated testing solution: Tata MD CHECK Automated testing solution can increase testing capacity by thousands with no cross-contamination. The solution can be deployed in an existing NABL II-approved molecular laboratory as well as Tata MD mobile testing labs.
- Tata MD Mobile Testing Labs: Tata MD is also deploying a proprietary 3-room design mobile testing lab, the lab built in partnership with Lowe's & United Way and fabricated by ShanMukha MIT can conduct end-to-end, on-site COVID-19 testing to increase the testing capacity in the state.

Website link:

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1728139

CSIR in partnership with Laxai Life Sciences received regulatory approval to undertake clinical trials with Colchicine on COVID-19 patients

Council of Scientific & Industrial Research (CSIR) and Laxai Life Sciences Pvt. Ltd. Hyderabad have been given the regulatory approval by DCGI to undertake a two-arm phase-II clinical trial to assess the safety and efficacy of the drug Colchicine in improvement of clinical outcomes during the treatment of COVID-19 patients. The partner CSIR institutes in this important clinical trial are the CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad and CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu.

Dr Shekhar C Mande, Director General of CSIR, expressed his happiness on the approval granted to conduct the clinical trial on this approved drug used for treating gout and related inflammatory conditions. Dr Ram Vishwakarma, Advisor to the DG-CSIR highlighted that colchicine in combination with standard of care will be an important therapeutic intervention for COVID patients with cardiac co-morbidities and also for reducing proinflammatory

cytokines, leading to faster recovery. A number of global studies have confirmed now that cardiac complications during the course of COVID-19 infections and post-COVID syndrome are leading to loss of many lives, and it is essential to look for new or repurposed drugs.

Dr S. Chandrasekhar (Director CSIR-IICT, Hyderabad) and Dr D.S. Reddy (Director, CSIR-IIIM, Jammu), the two partner institutes from CSIR, said that they are looking forward to the outcome of this Phase II clinical efficacy trial on Colchicine, which may lead to life-saving intervention in the management of hospitalized patients. India is one of the largest producers of this key drug, and if successful, it will be made available to the patients at an affordable cost.

Website link:

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1726423

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5

IMPACTING COVID MITIGATION

The efforts made by various agencies, apex bodies, domain institutions, and so on towards meeting the requirements posed due to the pandemic are compiled here for the consumption and benefits of the general public.

SECTION GUIDELINES

Extension Hospitals: A COVID-19 project facilitated by Office of the PSA

ICMR launches National Registry of Pregnant Women with COVID-19 in India

DST-supported Foundation For Innovations In Health, Kolkata designs software to identify patients likely to require ventilator support thus detecting emergency & ICU needs early

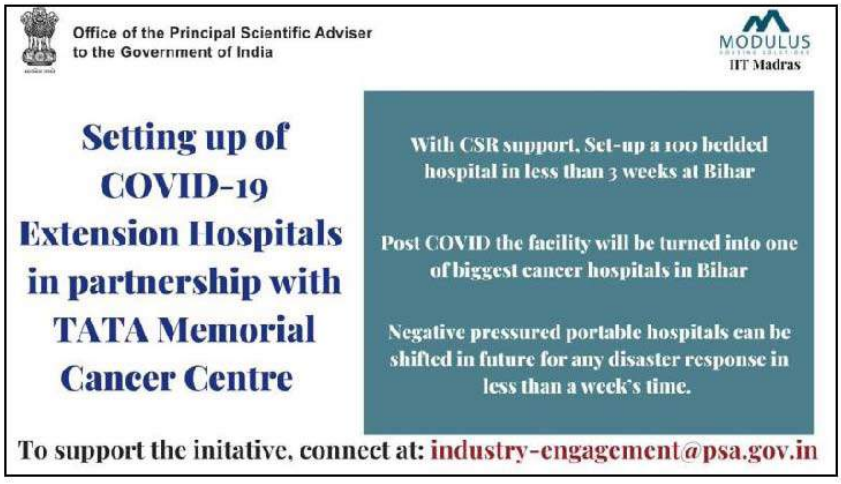
CSIR-IICT licenses process knowhow for synthesis of 2-Deoxy-D-Glucose to Lee Pharma Ltd

IIT Ropar develops power-free device 'JivanVayu' as a substitute for CPAP machine

Extension Hospitals: A COVID-19 project facilitated by Office of the PSA

As COVID-19 cases surged in different parts of the country, infrastructure in hospitals was under immense pressure. Innovative modular hospitals came as a huge relief amidst this. Modular hospitals are an extension of hospital infrastructure and can be built adjacent to an existing hospital building. **Office of the Principal Scientific Adviser (PSA), Government of India** invited private sector companies, donor organizations, and individuals to support various projects of national importance. **Project Extension Hospitals** is one such initiative. The office of the PSA identified requirements of close to **50 hospitals** in states where the highest number of COVID-19 cases was reported.

Modulus Housing, a start-up incubated at Indian Institute of Technology, Madras (IIT-M) developed the MediCAB hospitals. This enables building a 100-bedded extension facility in 3-weeks' time. MediCAB hospitals are designed with a dedicated zone of Intensive Care Units (ICUs) that can accommodate various life-support equipment and medical devices. These negative-pressure portable hospitals have durability of around 25 years, and they can also be shifted in the future for any disaster response in less than a week. These rapidly deployable hospitals will plug a major health infrastructure gap in India's fight against COVID-19, especially in rural areas and smaller towns. The office of the PSA has been actively working towards securing CSR support to implement these projects in different areas across the nation.



Modulus Housing has started deploying MediCAB extension hospitals with the help of the American Indian Foundation (AIF). Mastercard, Texas Instruments, Zscaler, PNB Housing, Goldman Sachs, Lenovo, and NASSCOM Foundation have also extended CSR support. The first batch of 100-bedded hospitals are being commissioned at Bilaspur (Chhattisgarh); Amravati, Pune, and Jalna (Maharastra); Mohali (Punjab), and a 20-bed hospital at Raipur (Chhattisgarh). Bengaluru (Karnataka) will have one each of 20-, 50-, and 100-beds hospitals in the first phase.

The office of the PSA has also collaborated with Tata Projects Ltd to deploy modular hospitals at multiple sites in Punjab and Chhattisgarh. They have initiated work on 48-bedded modular hospitals in Gurdaspur and Faridkot (Punjab). Expansion of ICU at multiple hospitals in Chhattisgarh including Raipur, Jashpur, Bemetara, Kanker, and Gaurella is also underway.

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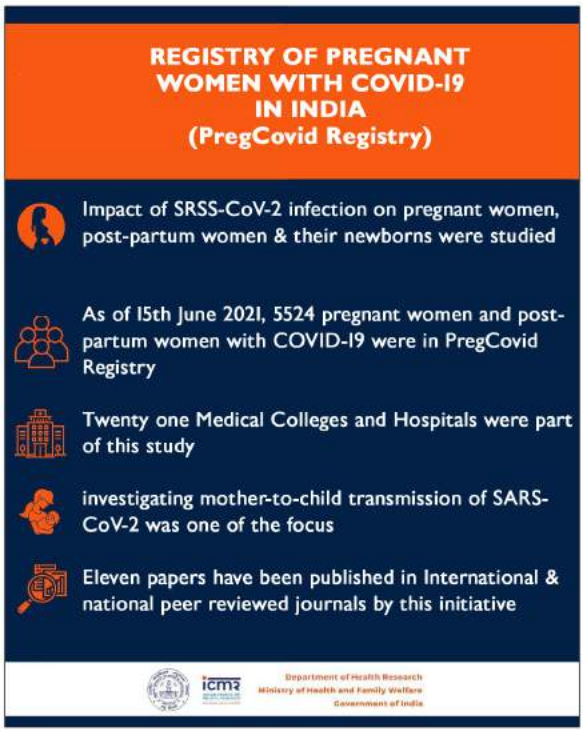
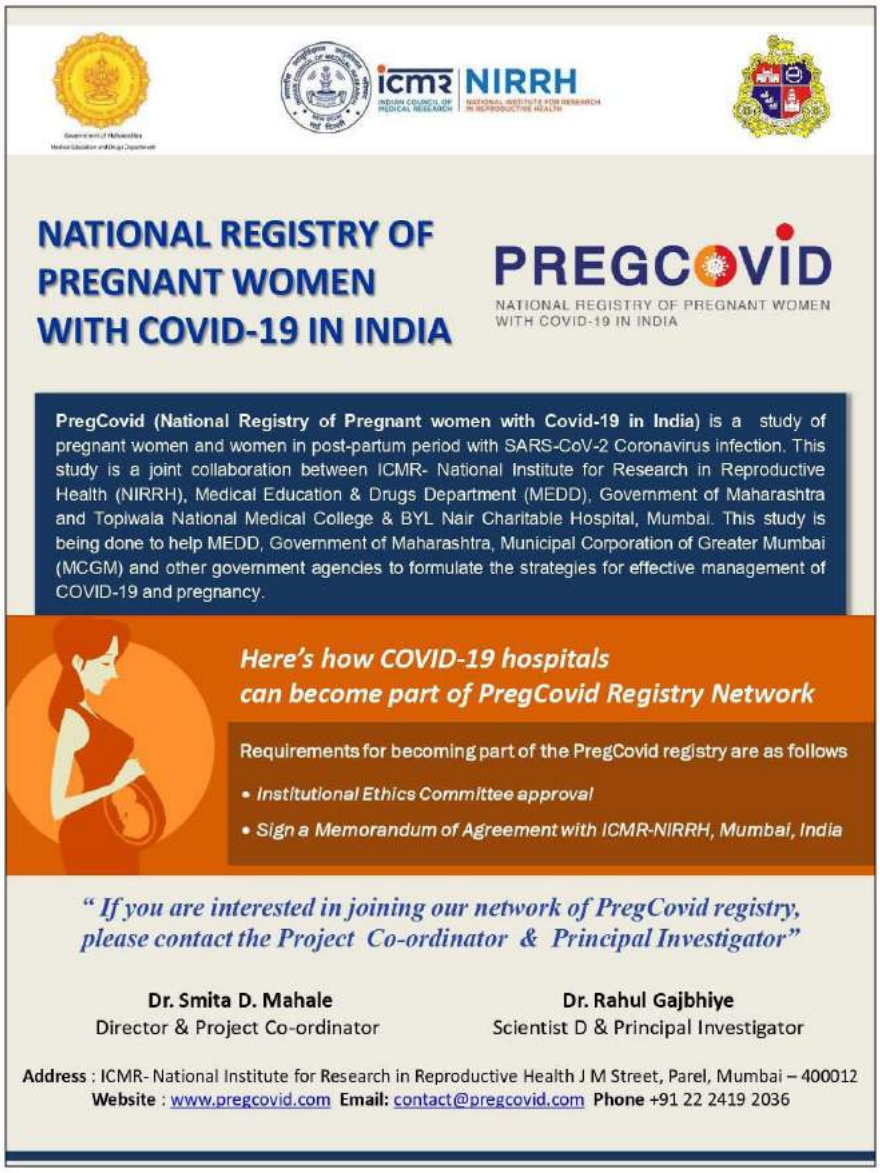
Website link:

https://pib.gov.in/PressReleasePage.aspx?PRID=1726726

ICMR launches National Registry of Pregnant Women with COVID-19 in India

PregCovid (National Registry of Pregnant Women with COVID-19 in India) is a study of pregnant women and women in post-partum period with SARS-CoV-2 infection. This study is a joint collaboration between ICMR-National Institute for Research in Reproductive Health (NIRRH), Medical Education & Drugs Department (MEDD), Government of Maharashtra and Topiwala National Medical College & B.Y.L. Nair Charitable Hospital, Mumbai. This study is being done by Medical Education & Drugs Department (MEDD), Government of Maharashtra, Municipal Corporation of Greater Mumbai (MCGM) and other government agencies to formulate the strategies for effective management of COVID-19 and pregnancy.





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Website Link:

https://pregcovid.com/

DST-supported Foundation For Innovations In Health, Kolkata designs software to identify patients likely to require ventilator support thus detecting emergency & ICU needs early

A software can now identify patients likely to require ventilator support in an ICU and referral in time and make necessary arrangements before emergency sets in. The software, called Covid Severity Score (CSS) Software, consists of an algorithm that measures a set of parameters. It scores each against a pre-set dynamic algorithm multiple times for each patient and allocates a CSS, mapping it in a graphical trend.

The technology is being used in three community Covid Care Centres at Kolkata and suburbs including a 100-bed government-mandated Covid Care Centre at Barrackpore, Kolkata.

Sudden ICU and other emergency requirements during the pandemic have been a challenge for hospitals to manage. Timely information about such situations would help manage the health crisis better.

The Foundation For Innovations In Health, Kolkata, with support from the Science for Equity, Empowerment and Development (SEED) division of the Department of Science & Technology, in collaboration with IIT Guwahati, Dr Kevin Dhaliwal, University of Edinburgh and Dr Sayantan Bandopadhyay, formerly WHO (SE Asia Regional Office), have developed an algorithm that measures symptoms, signs, vital parameters, test reports and comorbidities of the COVID-positive patient and scores each against a pre-set dynamic algorithm thus allocating a Covid Severity Score (CSS). This technology has been made available at primary care e-Health clinics in resource-poor settings through SEED Project support.

Frontline health workers trained in National Skills Qualifications Framework (NSQF)-aligned model and certified by National Skill Development Corporation (NSDC), Government of India are trained to record all these parameters in a tablet computer which has the software loaded in it.

The CSS is regularly monitored multiple times by 'remote' specialist doctors thus reducing the doctor's consultation time per patient and reducing their travel requirement. It can help early identification of patients likely to require ventilator support in an ICU and referral, reduce hospital referral for those unlikely to require critical care support, thus releasing more hospital beds in circulation. It will also help in providing monitored medical support to those patients who cannot afford treatment or cannot isolate at home due to poor housing conditions. The facility can be a huge support for 'Covid Care Centres' with beds and oxygen support only but no facility for invasive ventilation.

Website link:

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1728424

CSIR-IICT licenses process knowhow for synthesis of 2-Deoxy-D-Glucose to Lee Pharma Ltd

Indian Institute of Chemical Technology, (IICT), a constituent laboratory of CSIR and Lee Pharma, an integrated pharmaceutical company, based in Hyderabad have entered into a non-exclusive licensing agreement for synthesis of 2-Deoxy-D-Glucose (2-DG). Recently, 2-DG, developed by DRDO and Dr Reddy's Laboratories has received approval for use in COVID-19 patients. It has been found to help speed up recovery and reduce oxygen dependence and Dr. Reddy's Laboratories has launched the drug in the form of sachets.

Lee Pharma informed that they would file the application for getting the approval from DCGI, New Delhi. They will manufacture and commercialize the 2-DG sachets from their formulation facility located at SEZ, Duvvada, Visakhapatnam, Andhra Pradesh which has the accreditations by global regulatory agencies.

Dr Srivari Chandrashekar, Director CSIR-IICT highlighted that "There is role of CSIR in development of 2-DG, as CSIR-CCMB tested the drug on SARS-CoV-2 viral cultures. CSIR has been engaged in development of drugs for treatment of COVID-19 and has undertaken many clinical trials for repurposed drugs. Additionally, this agreement with Lee Pharma Ltd. is towards increasing affordable therapeutic options for treatment of COVID-19."

Raghumitra Alla, Director, Lee Pharma said, "This collaboration with CSIR-IICT for 2-DG, API is part of our broader strategy for enhancing COVID-19 treatment options. Further, CSIR-IICT, Hyderabad is well-known for its high quality research & development of various new molecules and we feel proud to be associated with them."

Website link:

https://pib.gov.in/PressReleasePage.aspx?PRID=1725576

IIT Ropar develops power-free device 'JivanVayu' as a substitute for CPAP machine

Indian Institute of Technology (IIT) Ropar has developed a power-free device 'JivanVayu', which can be used as a substitute for a Continuous Positive Airway Pressure (CPAP) machine. The device functions without electricity and is adapted to both kinds of oxygen generation units like oxygen cylinders and oxygen pipelines in hospitals. The device is designed to maintain a fraction of inspired oxygen of above 40 per cent with a positive end-expiratory pressure of 5-20 cm H_2O. Additionally, the device houses a viral filter at the air entrainment end having a viral capture efficacy of 99.99 per cent. The device has been manufactured using 3D printing and has been tested mechanically. The device is designed for a 22-mm CPAP closed circuit and can also be customized. Medical testing of the device would be conducted and the team is currently seeking industrial collaboration for its commercialization.

Website link:

https://fisd.in/NEWS/alerts-archives/ISSUE%2063/FISD%20News%20Alert%2063.html

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6

RESEARCH SUPPORTS

The scientific approach has driven the ways the country is mitigating the pandemic. Here is an effort to sew up the significant contributions made by STI communities to humankind. The information is most suitable for the research fraternity, for whom the contact information is also provided to communicate further and up-skill the research.

SECTION GUIDELINES

Immunological memory to SARS-CoV-2 in Indian population: Implications for design and implementation of vaccine

Repurposing drugs against main protease of SARS-CoV-2: Mechanism-based insights supported by available clinical data

Neutralization potential of Covishield-vaccinated individuals' sera against B.1.617.1

Precipitation dynamics of surrogate respiratory sessile droplets leading to possible fomites

Proteo-genomic analysis of SARS-CoV-2: A clinical landscape of SNPs, COVID-19 proteome and host responses

Targeting inflammatory cytokine storm to fight against COVID-19-associated severe complications

Inactivated COVID-19 vaccine BBV152/COVAXIN effectively neutralizes recently emerged B.1.1.7 variant of SARS-CoV-2

Neutralization of B.1.1.28 P2 variant with sera of natural SARS-CoV-2 infection and recipients of inactivated COVID-19 vaccine, Covaxin

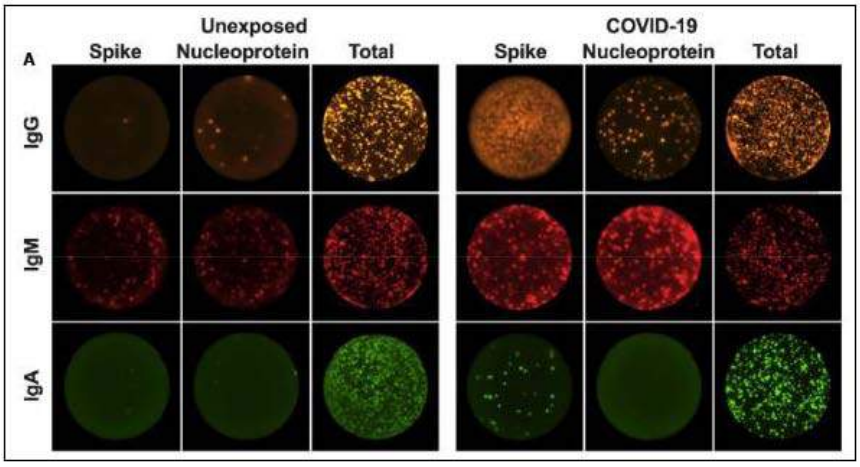
Immunological memory to SARS-CoV-2 in Indian population: Implications for design and implementation of vaccine

The COVID-19 pandemic has become a major threat to public health globally. In current scenario, vaccine is the most preferred preventive measures to protect from COVID-19. However, there are several questions that need to be answered for successful implementation of vaccine; particularly, (i) how long the vaccine will provide the protective cover; (ii) whether the vaccine will protect against all recently circulating and future variants of virus; and (iii) what should be the vaccination schedule and dosage for the individuals recovered from COVID-19. To answer these questions there is a need to investigate the underlying immunological determinants of protective immunity in COVID-19 patients in India.

Dr Nimesh Gupta's group at the National Institute of Immunology (NII) is applying the advanced human T-cell immunology setup to address these questions in COVID-19 patients. The research program is actively progressing in multi-centric collaboration with Dr Ashok Sharma, Biochemistry Department and Dr Poonam Coshic, Department of Transfusion Medicine at the All India Institute of Medical Sciences (AIIMS), New Delhi. The research program is supported under the Intensification of Research in High Priority Areas (IRHPA) scheme of Science and Engineering Research Board (SERB), Department of Science and Technology, India.

A recent study from the group indicates that almost 70% of the examined Indian cohort has very high levels of SARS-CoV-2 reactive CD4+ T cells, which are present prior to the COVID-19 pandemic. These already present T cells strongly respond to the COVID-19 virus. Indeed, the pre-existing cross-reactive CD4+ T cells will not completely abort the virus infection but they can definitely limit the virus burden and reduce the course of symptomatic infection. This will lead to less severe disease and lower rates of hospitalization. These SARS-CoV-2 reactive CD4+ T cells may have originated due to previous exposure to the highly prevalent 'Common Cold' viruses.

This study also reveals that the Indian patients recovered from mild COVID-19 disease have durable immunological memory in most important arms of protective immunity – T cells and B cells. The team believes that such immunological memory should give protection at least for a few years. Interestingly, the memory CD4+ T cells and B cells in COVID-19 patients are predominantly associated with the spike protein of the virus. It's a good sign. As these responses are mainly targeted towards the Spike protein, it also gives high hopes to the current vaccines. Because, if the vaccine can induce the immune response like seen in mild patients, then it will offer an effective and long-lasting cellular immunity against SARS-CoV-2.



SARS-CoV-2-specific memory B cells in recovered COVID-19 patients

Moreover, this study suggests not to use virus nucleoprotein as the target protein for sero-epidemiological surveys in India. It may give a wrong indication as almost 30% of the tested donors showed cross-reactive antibodies to SARS-CoV-2 nucleoprotein without the exposure to virus prior to pandemic.

The study also hints that single-dose immunization with COVID vaccine may be sufficient to establish optimal protective responses in the individuals recovered from mild COVID-19. Thus, these findings are crucial in our understanding of how Indian population is responding to the COVID-19 virus. It also provides a key message for vaccine implementation in India.

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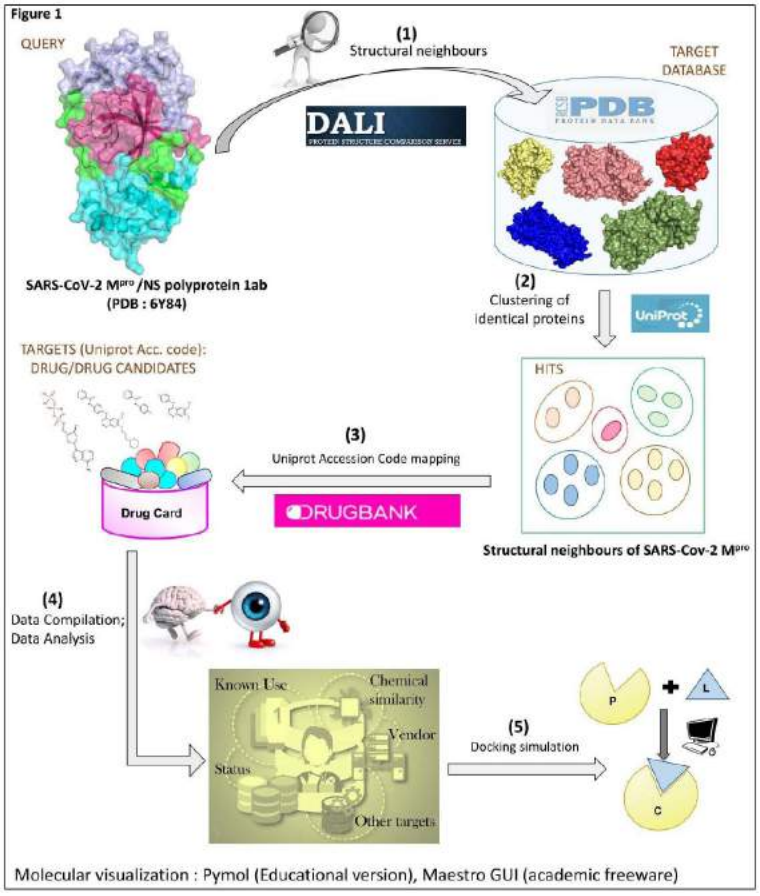
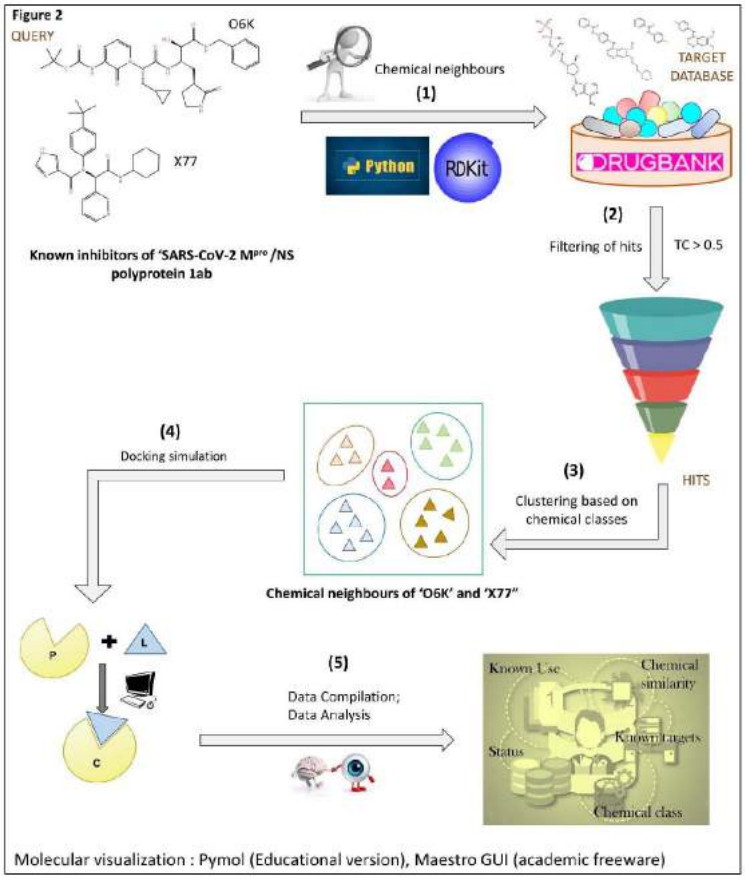
https://doi.org/10.3389/fimmu.2021.636768

Repurposing drugs against main protease of SARS-CoV-2: Mechanism-based insights supported by available clinical data

The on-going global pandemic of COVID-19 has brought life to almost standstill with implementations of lockdown and social distancing as some of the preventive measures in the absence of any approved specific therapeutic interventions. To combat this crisis, research community world-wide are falling back on the existing repertoire of approved/ investigational drugs to probe into their anti-coronavirus properties. In a pre-print study by researchers at Indian Institute of Science (IISc), Bangalore have put unique efforts in identifying





potential drugs that could be repurposed against main protease of SARS-CoV-2 (SARS-CoV-2 M^{pro}). To achieve this goal, the team primarily exploited the principles of 'neighbourhood behaviour' in protein 3-D (workflow-I) and chemical 2-D structural space (workflow-II) coupled with docking simulations and insights into the possible mode of actions of the selected candidates from available literature. Such an integrative approach culminated in prioritizing 29 potential repurposable agents (20 approved drugs and 9 investigational molecules) against SARS-CoV-2 M^{pro}. Apart from the approved/investigational anti-viral drugs, other notable hits include anti-bacterial, anti-inflammatory, anti-cancer and anti-coagulant drugs. The analysis suggests that some of these drugs have the potential to simultaneously modulate the functions of viral proteins and host response system. Interestingly, many of these identified candidates (12 molecules from workflow-I and several molecules belonging to the chemical classes of alkaloids, tetracyclines, peptidomimetics from workflow-II) are suggested to possess anti-viral properties which are supported by laboratory and clinical data. Further, this work opens a new avenue of research to probe into the molecular mechanism of action of many drugs which are known to demonstrate anti-viral activity but are so far not known to target viral proteases. The findings should only be used for research purposes and the team strongly urges that no individual should interpret these findings for any self-diagnosis or self-medication without the prior approval from competent international health/medical regulatory agencies.

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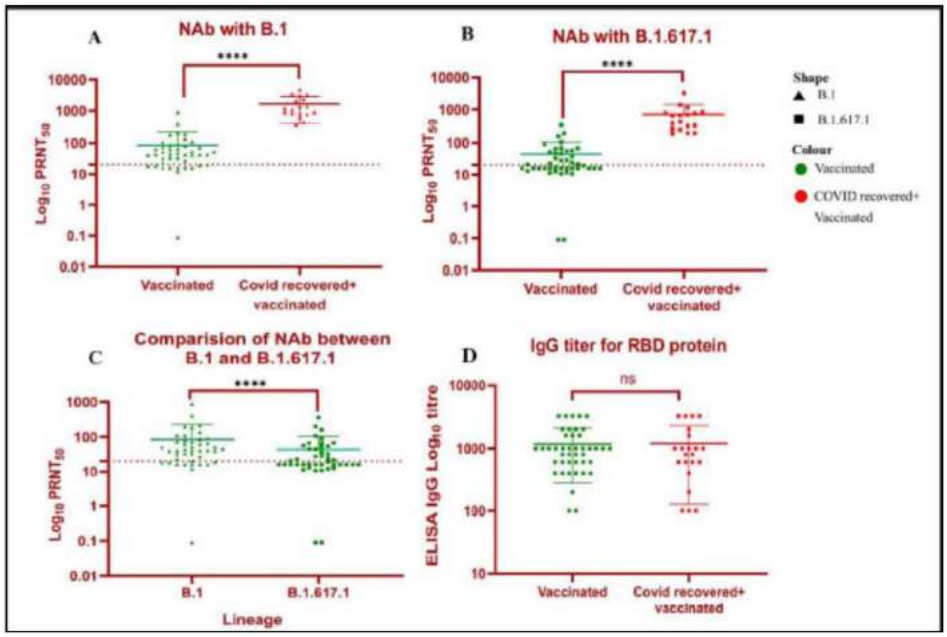
Website link:

https://covid19.iisc.ac.in/drug-repurposing-approach-targeted-against-main-protease-of-sars-cov-2-preprint/

Neutralization potential of Covishield-vaccinated individuals' sera against B.1.617.1

Covishield comprises the larger proportion in the vaccination programme in India. Hence, it is of utmost importance to understand neutralizing capability of vaccine against the B.1.617.1 variant which is considered to be responsible for surge of the cases in India. The neutralizing-antibody (NAb) titer against B.1.167.1 and prototype B.1 variant (D614G) was determined of the vaccine sera (4 weeks after second dose) of COVID-19 naïve subjects (n=43) and COVID-19-recovered subjects (n-18). The results demonstrated that sera of COVID-19 recovered subjects (n=18) who received two doses of Covishield have higher NAb response compared to the COVID-19 naive with a significant difference ($p<0.0001$) in NAb titer against B.1 and B.1.617.1 In-spite of reduction in the neutralizing titer against B.1.617.1 variant, Covishield vaccine-induced antibodies are likely to be protective to limit the severity and mortality of the disease in the vaccinated individuals.



Neutralization of B.1.617.1 variant

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https://www.icmr.gov.in/pdf/covid/papers/B.1.617%20NT%20with%20Covishield.pdf

Precipitation dynamics of surrogate respiratory sessile droplets leading to possible fomites

The on-going COVID-19 pandemic has disrupted global travel, healthcare systems, social interactions, and business activities. Primary transmission of the virus occurs at the microscale level, where respiratory droplets rapidly spread the SARS-CoV-2 among human beings. To arrest the transmission of the virus, wearing a facemask and maintaining social distances has been advised by the scientific and medical community worldwide. The ejected droplets are in the size range of 1–2000 um and create two possible scenarios of infection. Smaller droplets

can evaporate, precipitate, travel far, and stay airborne for a sufficiently long time before being directly inspired by another healthy human being. On the other hand, the larger droplets may settle under gravity or impinge on a material surface, forming fomites. In either scenario, infection mechanics, which involve virus survivability, remains elusive. In an article, a team of researchers at IISC Bangalore has discussed the physicochemical transformations within a VEP (virus emulating particles)-loaded surrogate respiratory droplet drying on different commonly available real-life surfaces.

Hypothesis

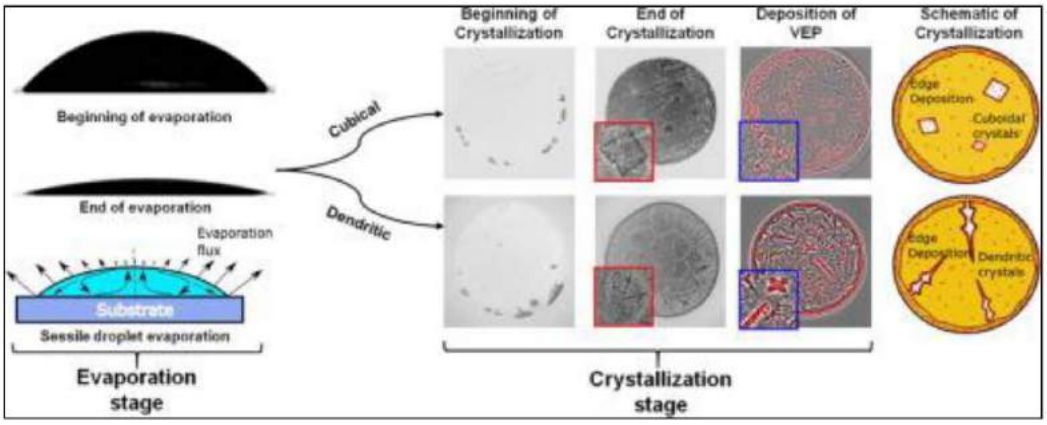
The droplets ejected from an infected host during expiratory events can get deposited as fomites on everyday use surfaces. Recognizing that these fomites can be a secondary route for disease transmission, exploring the deposition pattern of such sessile respiratory droplets on daily-use substrates thus becomes crucial.

Experiments

The used surrogate respiratory fluid is composed of a water-based salt-protein solution, and its precipitation dynamics is studied on four different substrates (glass, ceramic, steel, and PET). For tracking the final deposition of viruses in these droplets, 100 nm VEP are used and their distribution in dried-out patterns is identified using fluorescence and SEM imaging techniques.

Findings

The final precipitation pattern and VEP deposition strongly depend on the interfacial transport processes, edge evaporation, and crystallization dynamics. A constant contact radius mode of evaporation with a mixture of capillary and Marangoni flows results in spatio-temporally varying edge deposits. Dendritic and cruciform-shaped crystals are majorly seen in all substrates except on steel, where regular cubical crystals are formed. The VEP deposition is higher near the three-phase contact line and crystal surfaces. The results showed the role of interfacial processes in determining the initiation of fomite-type infection pathways in the context of COVID-19.



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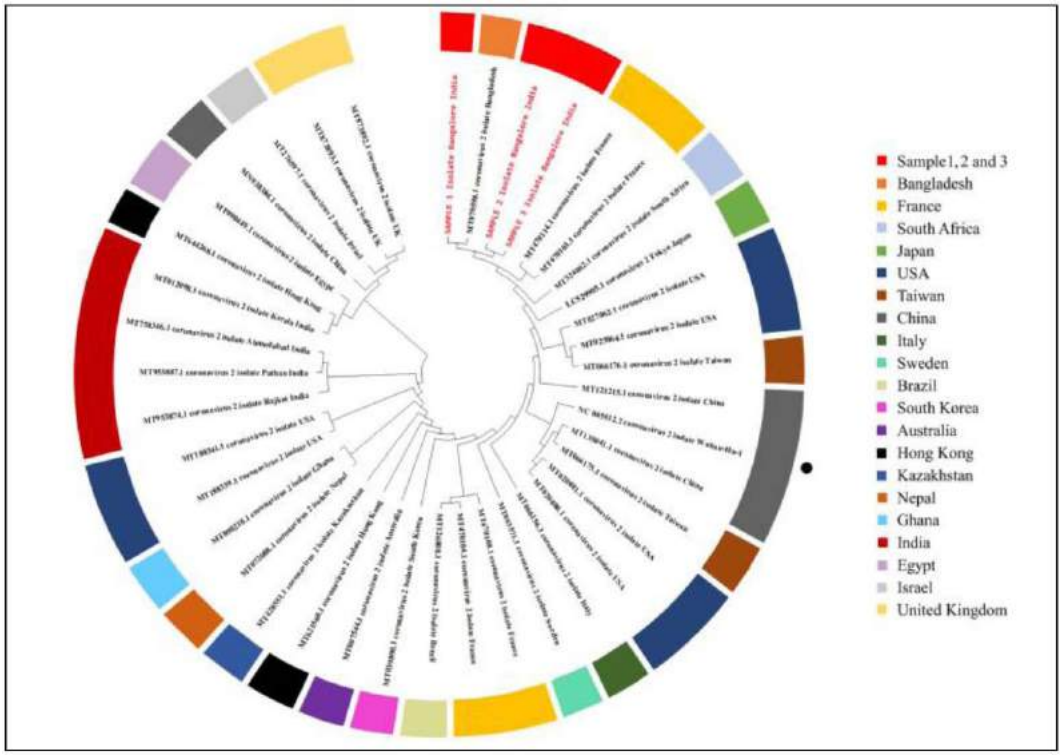
Website link:

https://covid19.iisc.ac.in/precipitation-dynamics-of-surrogate-respiratory-sessile-droplets-leadingto-possible-fomites/

Proteo-genomic analysis of SARS-CoV-2: A clinical landscape of SNPs, COVID-19 proteome and host responses

A novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the causative agent of COVID-19 and continues to be a global health challenge. To understand viral disease biology, a team of researchers at IISc carried out proteo-genomic analysis using next generation sequencing (NGS) and mass spectrometry on nasopharyngeal swabs of COVID-19 patients to examine clinical genome and proteome. The study confirms the mutability of SARS-CoV-2 showing multiple single nucleotide polymorphisms (SNPs). NGS analysis detected 27 mutations of which 14 are synonymous, 11 are missense and 2 are extragenic in nature. Phylogenetic analysis of SARS-CoV-2 isolates indicated their close relation to Bangladesh isolate and multiple origins of isolates within the country. The proteomic analysis, for the first time identified 13 different SARS-CoV-2 proteins from the clinical swabs. Of the total 41 peptides captured by HRMS, 8 matched to nucleocapsid protein, 2 to ORF9b, 1 to spike glycoprotein and ORF3a, with remaining peptides mapping to ORF1ab polyprotein. Additionally, host proteome analysis revealed several key host proteins to be uniquely expressed in COVID-19 patients. Pathway analysis of these proteins points towards modulation in immune response, especially involving neutrophil and IL-12-mediated signalling. Besides revealing the aspects of host-virus pathogenesis, the study opens new avenues to develop better diagnostic markers and therapeutic approaches.



Phylogenetic Analysis of SARS-COV-2 isolates

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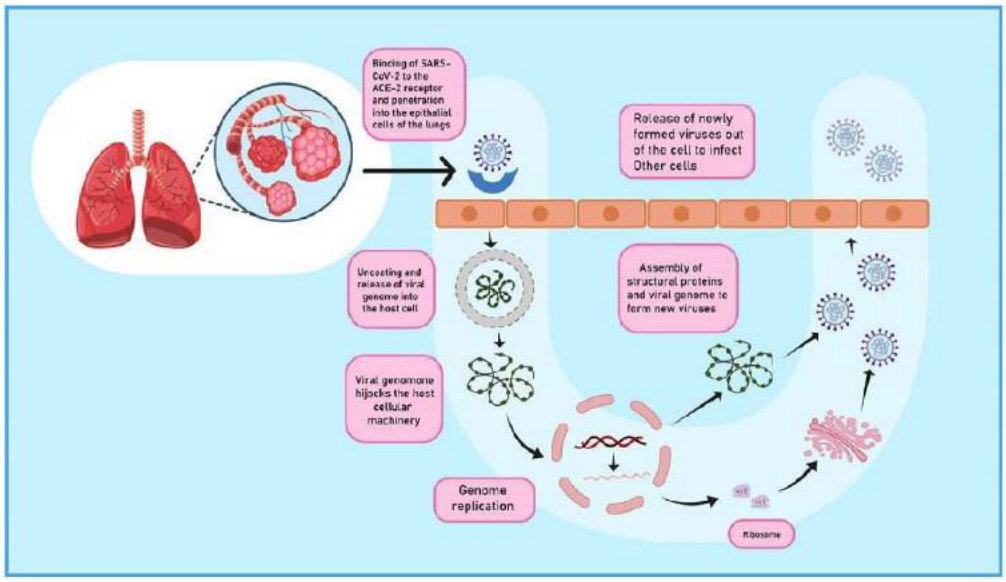
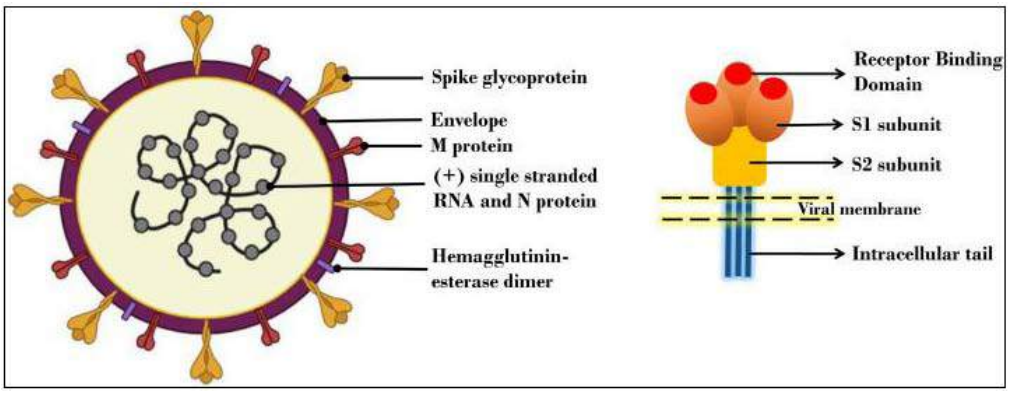
https://covid19.iisc.ac.in/proteo-genomic-analysis-of-sars-cov-2-a-clinical-landscape-of-snps-covid-19-proteome-and-host-responses/

Targeting inflammatory cytokine storm to fight against COVID-19-associated severe complications

COVID-19 is characterised by pneumonia progressing to breathing difficulty, acute respiratory distress syndrome (ARDS) and multi-organ failure. Clinical studies suggest excessive release of inflammatory mediators leading to cytokine storm, a phenomenon which appears to be potentially life-threatening in COVID-19. Across the globe, when the world authorities are grappling to contain the virus, a team of researchers from National Institute for Pharmaceutical Education and Research, Hyderabad presented a review on structure, pathophysiology of the virus that further sheds light on various clinical complications associated with the disease in order to open up/raise new horizons to explore various possible theoretical targets for COVID-19. The review also portrays a question and debates: Can targeting cytokine storm be a feasible approach to combat COVID-19?





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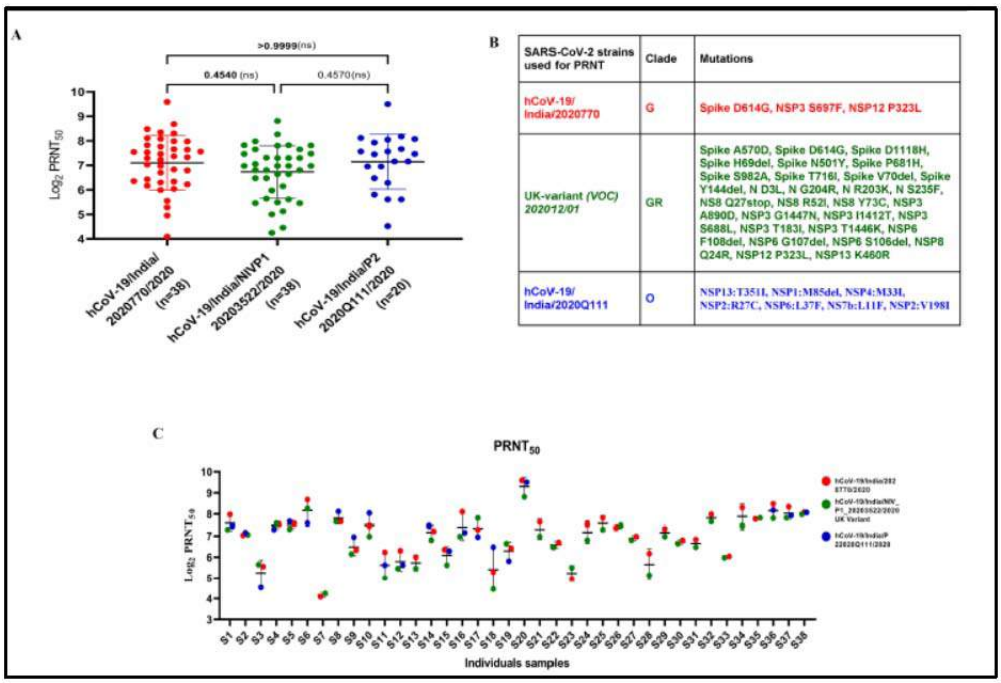
Website Link:

https://www.researchgate.net/publication/348018860_Targeting_inflammatory_cytokine_storm_to_fight_against_COVID-19_associated_severe_complications

Inactivated COVID-19 vaccine BBV152/COVAXIN effectively neutralizes recently emerged B.1.1.7 variant of SARS-CoV-2

The rapid surge of SARS-CoV-2 cases due to the 'variant of concern (VOC) 202 012/01', also known as lineage B.1.1.7 or 20B/501Y.V1 in the UK, in December 2020, raised concerns in several countries due to its high transmissibility. Many of these countries had direct flights to and from the UK. Since the identification of the new variants of SARS-CoV-2 in the UK and South Africa, health experts have also expressed their concerns about their potential implications pertaining to vaccine efficacy. The root of such concerns was grounded in the structure of the SARS-CoV-2 variant, VOC-202012/01, which came to the centre stage of discussion due to its greater transmissibility in humans compared to the other known SARS-CoV-2 lineages.

This variant carries 17 mutations in the genome; 8 of which have been found in spike receptor-binding domain (RBD), mediating the attachment of the virus to the angiotensin-converting enzyme 2 (ACE2) receptor on the surface of human cells. One of these mutations, N501Y, at position 501, has asparagine (N) replaced with tyrosine (Y) and has been identified to increase the binding affinity of SARS-CoV-2 to human and murine ACE2.2



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Website Link:

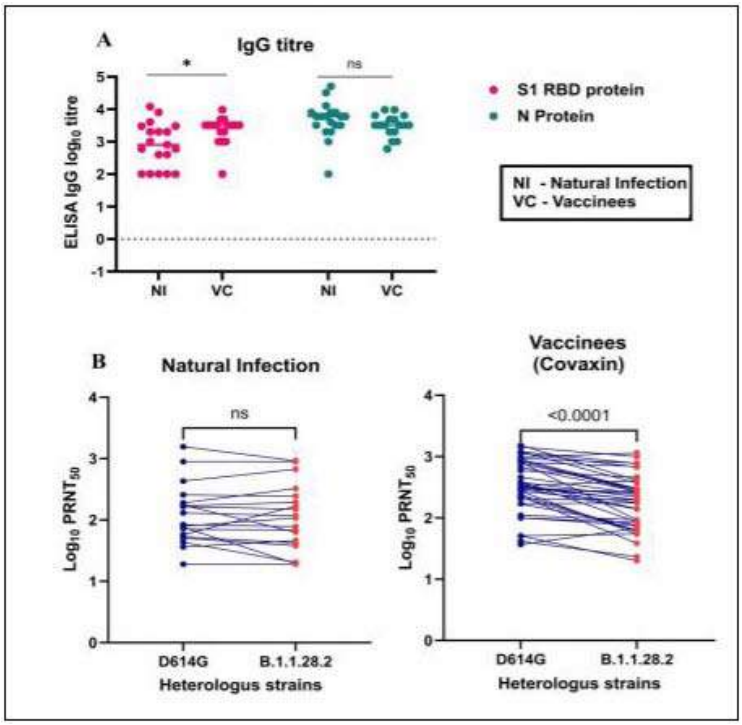
https://www.icmr.gov.in/pdf/covid/papers/B.1.1.7%20NT%20with%20Covaxin.pdf

Neutralization of B.1.1.28 P2 variant with sera of natural SARS-CoV-2 infection and recipients of inactivated COVID-19 vaccine, Covaxin

The emergence of SARS-CoV-2 variants with mutations in the spike protein region lead to growing concerns about the efficacy of the currently available COVID-19 vaccines or neutralizing capability of the sera of individuals infected naturally with the earlier circulating strains. Although some of the vaccines seem to be effective against the UK variant, the efficacy

of them against the South African variant has been demonstrated to be less. A SARS-CoV-2 vaccine that used an inactivation platform has been reported to be 50.7% efficacious from Brazil, where the B.1.1.28.2 variant is more prevalent (NCT0445659). Similarly, Brazil variant P2lineage (B.1.1.28.2) virus isolated from international travellers coming to India from abroad was used to determine the neutralization activity with sera of vaccine recipients and recovered COVID-19 cases.

In this study, it is determined the IgG immune response and neutralizing activity of the 19 convalescent sera specimens obtained from the recovered cases of COVID-19 and confirmed for B.1.1.7 (UK) (n=2), B.1.351 (South Africa) (n=2), B.1.1.28.2 (n=2), B1 lineage (n=13) (15-113 days post positive test). The data were compared with 42 participants immunized with an inactivated COVID-19 vaccine, Covaxin (BBV152), as part of phase II clinical trial (two months post the second dose). Neutralizing antibody (NAb) titers of all the serum specimens were evaluated against B.1.1.28.2 variant using plaque reduction neutralization test (PRNT50). Neutralization activity of B.1.1.28.2 was compared with prototype D614G variant as Covaxin vaccine has been developed using D614G variant.



Response and neutralizing activity post-natural SARS-CoV-2 infection and Covaxin recipients

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Website Link:

https://www.icmr.gov.in/pdf/covid/papers/B.1.1.28%20P2%20NT%20with%20Covaxin.pdf

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7

START-UP SPOTLIGHTS

Numerous start-up companies have timely contributed to the warfare against fighting the pandemic out in countless ways. Here is an effort to compile those contributions and sew up for the usage of the entrepreneur communities.

SECTION GUIDELINES

Ubio Biotechnology Systems develops SENSIT Rapid COVID-19 Ag Kit

Parisodhana Technologies develops hybrid multiply facemasks – An alternative to N95 respirator

DBT-funded start-up Dozee offers AI-powered contact-free health monitor & step-down ICU

Ubio Biotechnology Systems develops SENSIT Rapid COVID-19 Ag Kit

The entire world has been severely affected by the on-going COVID-19 pandemic. The severity of symptoms that occur during the COVID-19 infection can range from undetectable to life-threatening. The quick testing procedure involves antigen testing which provides the result for hundreds of samples within a short span of time. The efforts of the Government of India have been commendable for making such rapid tests accessible and available to the citizens of the country. Several innovators and entrepreneurs have been working tirelessly for developing accurate, affordable and accessible testing kits for not only providing aid to the healthcare workers in such tough times for easy detection but also for boosting the biotechnology ecosystem in India.

Under the aegis of COVID-19 Research Consortium, DBT-BIRAC-supported product 'SENSIT Rapid COVID-19 Ag Kit' has been developed by Ubio Biotechnology Systems Pvt. Ltd. for qualitative detection of SARS CoV-2 Nucleocapsid Protein with an assay time of 15 minutes. The samples are collected using nasopharyngeal swabs from the suspected individual. This ICMR-approved Kit is a chromatographic immunoassay, which allows the healthcare personnel to visually read the test result. The test works on the principle of sandwich immunoassay and utilizes a pair of monoclonal antibodies which when bound to COVID-19 specific antigen result in appearance of a coloured line. The Kit exhibits sensitivity and specificity of 86% and 100%, respectively and has a shelf life of 24 months. SENSIT Rapid COVID-19 Ag Kit has been successfully commercialised.

Such quick tests allow healthcare professionals to detect infected individuals quickly, saving their time and allowing them to provide better advice and treatment to the infected individual.

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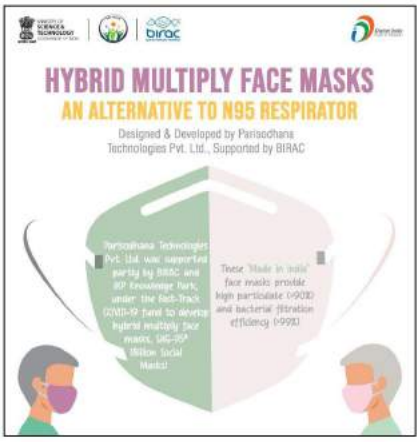
https://www.pib.gov.in/PressReleasePage.aspx?PRID=1728428

Parisodhana Technologies develops hybrid multiply facemasks – An alternative to N95 respirator



COVID-19 pandemic has played havoc for humans across the globe. The first line of defense against the prevailing situation have been sanitizers, facemasks and adopting COVID-appropriate behaviour. Masks have been recommended by WHO to protect against and limit the spread of COVID-19. N95 facemasks especially have been considered more effective in reducing the transmission of COVID-19 virus from an infected person to a non-infected one. But the N95 facemasks prove to be uncomfortable for many and are mostly not washable.

Parisodhana Technologies Pvt. Ltd. was supported partly by BIRAC and IKP Knowledge Park, under the Fast-Track COVID-19 fund to develop hybrid multiply facemasks, SHG-95® (Billion Social Masks). These 'Made in India' facemasks provide high particulate (>90%) and bacterial filtration efficiency (>99%). The facemasks so developed ensure high breathability, have comfortable ear loops, and are convenient to be used even in tropical conditions since they are prepared from purely hand weaved cotton contact materials. A special filtration layer is an added advantage. The cost of these hand washable and reusable facemasks has been estimated as Rs. 50-75 per piece by the company, making it affordable for general public.

With around 145000+ units sold, this initiative, which is also funded by Grand Challenges Canada, has been designed to meet the demands in times of COVID-19, while improving the livelihoods of many Self-Help Groups (SHGs). The founders of Parisodhana Technologies Pvt. Ltd. envision to create solutions to problems faced by the humankind through utilising applied research and affordable product development.

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https://pib.gov.in/PressReleasePage.aspx?PRID=1725826

DBT-funded start-up Dozee offers AI-powered contact-free health monitor & step-down ICU

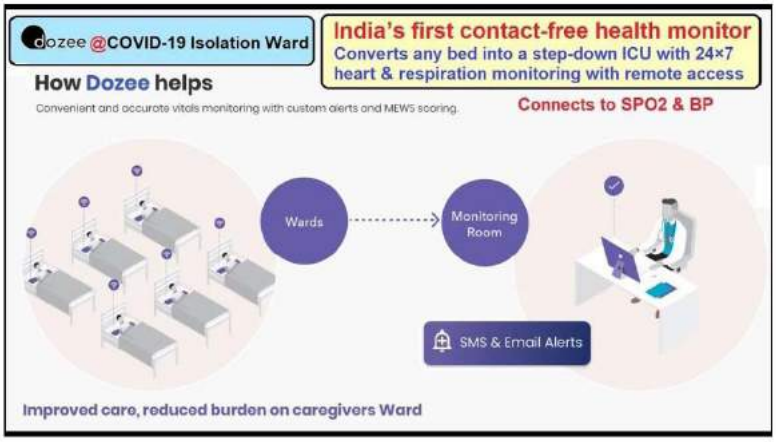
Dozee, a Department of Biotechnology (DBT) and its PSU Biotechnology Industry Research Assistance Council (BIRAC)-funded start-up offers contact-free monitoring of the vital parameters of the patients on a normal bed. The innovation has already resulted in the upgrading

of over 4,000 hospital beds for Step-Down ICUs across 35 districts in India. In the last months, Dozee has already served over 30,000 patients, saved over 65,000 nursing hours and prompted over 750 timely ICU transfers through its Early Warning System.

Dozee is an easy-to-deploy solution to upgrade the normal hospital bed to a Step-Down-ICU. It records the micro-vibrations produced in the heart-beat and respiration cycle using Ballistocardiography when placed under a mattress. The device, using Artificial Intelligence algorithms, converts this data into vital signs like heart rate, respiration rate, and blood pressure. The device has 98.4% proven accuracy as a medical-grade product. The device also records oxygen saturation and ECG using accessories. The data can also be accessed remotely on any smart phone via an app. The data can also be monitored on a central monitoring dashboard.

Dozee also features an AI-powered Early Warning System that sends proactive alerts to clinicians, thereby reducing the nursing staff's workload and improving patient outcomes. The system also provides ICU-grade monitoring to every bed with no inconvenience of wires or electrodes to the patient, thus improving the overall administration for patients' care.

Through its Million ICU initiative, Dozee aims to improve public healthcare by utilising transformative technology to provide high-quality care to every individual. The company aims to upgrade 50,000 public hospital beds into Step-Down ICUs by raising CSR funds from several Indian and International organisations. This initiative will enable the hospitals to respond to the COVID-19 crisis and usher in a rapid and long-term transformation in India's public healthcare infrastructure.



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8

COMMUNICATIONS, RESOURCES AND OUTREACH

The section contains information about various aspects of the COVID-19 pandemic communicated by different reliable media houses, like Press Information Bureau (PIB). Also, the efforts made by multiple agencies and institutions in compiling the information, releasing the knowledge products in print or digital form, and outreaching to various target audiences are gathered here for one-point, ready-to-use evidence.

SECTION GUIDELINES

PM launches Customised Crash Course Programme for COVID-19 Frontline Workers

Outreach initiatives by India Science Channel

COVID-19 in Children: Threats & Precautions – An outreaching effort by CSIR-NIScPR

Kiren Rijiju releases e-book on 20 Medicinal Plants for Covid-19 Care

Decision to increase gap between Covishield doses taken on scientific evidence in a transparent manner: NTAGI

Delta Plus is not yet classified as Variant of Concern

DRDO Secretary informs setting up of 850 oxygen plants in various districts of the country

COVID 2021: Nation's S&T Efforts Against COVID-19 – An e-Newsletter on COVID-19

Outreach initiatives through India Science, Technology and Innovation (ISTI) Web Portal

Press Information Bureau releases daily bulletin on COVID-19

Government of India presents regular COVID-19 India factsheet and immunisation programme

Psychosocial Support to Persons with Disabilities During COVID-19 Pandemic, a source book released by NIMHANS-Bengaluru

PM launches Customised Crash Course Programme for COVID-19 Frontline Workers

On 18 June Prime Minister Shri Narendra Modi launched 'Customized Crash Course Programme for COVID-19 Frontline Workers' via video conferencing. The training programme would be conducted in 111 training centres spread over 26 states. About one lakh frontline workers will be trained in this initiative. The Union Minister of Skill Development and Entrepreneurship Dr Mahendra Nath Pandey and many other Union Ministers, Ministers from States, experts and other stakeholders were also present on the occasion.

Addressing the event, the Prime Minister said that this launch is an important step in the fight against Corona. He cautioned that the virus is present and possibility of mutation is also there. The second wave of the pandemic illustrated the kind of challenges the virus may present to us. The country needs to stay prepared to meet the challenges, and training more than one lakh frontline warriors is a step in that direction, said the Prime Minister.

The Prime Minister reminded us that the pandemic has tested the strength of every country, institution, society, family and person of the world. At the same time, this alerted us to expand our capabilities as science, government, society, institution or individuals. India took up this challenge and status of PPE kits, testing and other medical infrastructure related to COVID care and treatment bears testimony to the efforts. He pointed out that far-flung hospitals are being provided with ventilators and oxygen concentrators. More than 1500 oxygen plants are being established at war footing. Amidst all these efforts, skilled manpower is critical. For this and to support the current force of corona warriors one lakh youth is being trained. This training should be over in two-three months, said the Prime Minister.

The Prime Minister informed that the top experts of the country have designed these six courses, as per demands of the States and Union Territories. The training will be imparted to COVID warriors in six customised job roles namely Home Care Support, Basic Care Support, Advanced Care Support, Emergency Care Support, Sample Collection Support, and Medical Equipment Support. This will include fresh skilling as well as up-skilling of those who have some training in this type of work. This campaign will give fresh energy to the health sector frontline force and will also provide job opportunities to our youth.

The Prime Minister said that the Corona period has proved how important the mantra of skill, re-skill and up-skill. The Prime Minister said the Skill India Mission was started separately for the first time in the country, a Skill Development Ministry was created and the Prime Minister's Skill Development Centres were opened across the country. Today Skill India Mission is helping

millions of this country's youth every year in providing training according to the needs of the day. Since last year the Ministry of Skill Development has trained lakhs of health workers across the country, even amidst the pandemic.

The Prime Minister said given the size of our population, it is necessary to keep increasing the number of doctors, nurses and paramedics in the health sector. Work has been done with a focused approach over the last 7 years to start new AIIMS, new medical colleges and new nursing colleges. Similarly, reforms are being encouraged in medical education and related institutions. The seriousness and the pace at which the work on preparing the health professionals is going on now are unprecedented.

The Prime Minister said that health professionals like ASHA workers, ANM, Anganwadi and health workers deployed in the dispensaries of the villages are one of the strong pillars of our health sector and are often left out of the discussion. They are playing an important role in preventing infection to support the world's largest vaccination campaign. The Prime Minister lauded these health workers for their work during all the adversities for the safety of each and every countryman. He said their role is huge in preventing the spread of infection in villages in remote areas and in hilly and tribal areas.

The Prime Minister said many guidelines have been issued related to the campaign which is to start from 21 June. People below 45 years of age will get the same treatment for vaccination as for people above 45 years of age from 21 June. The Union Government is committed to give free vaccines to every citizen while following corona protocol.

The Prime Minister wished the trainees and said he believed that their new skills will be used in saving the lives of the countrymen.

Website link:

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1728135

Outreach initiatives by India Science Channel

India Science is an Internet-based Over-The-Top (OTT) Science TV channel. It is an initiative of the Department of Science and Technology (DST), Government of India, implemented and managed by Vigyan Prasar (VP), an autonomous organisation of the DST. This 24x7 video platform is dedicated to science and technology knowledge dissemination, with a strong commitment to spreading scientific awareness, especially with Indian perspectives, ethos and cultural milieu. The initiative is supported by the National Council of Science and Technology Communication (NCSTC), DST.

Science and Technology are the main driving forces of the nation and fundamental to progress and growth. So, the advantages of science and technology must reach all sections of the society through popular media of communication. India's large Internet user base of 500 million is split

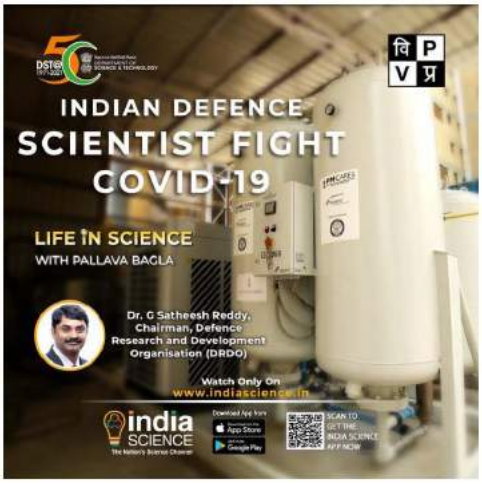
between 305 million urban Indians and 195 million rural Indians, all of whom need to be reached with authentic science and technology content. And to do so, the Internet is fast becoming the most accessible and preferred media for content delivery.

Since the occurrence of COVID-19, India Science has been working tirelessly to connect with the people, in the form of regular bulletins, documentaries, interviews, bytes and live sessions of scientists, doctors, experts, science administrators and policymakers. The following is a brief account of the information products produced by India Science.

1. Weekly COVID-19 video bulletin: Produced in both Hindi and English on weekly basis from 7 July 2020, COVID-19 bulletin apprises the audience about the latest developments happening in the S&T scenario in India that are helping in managing and overcoming the challenges thrown up by the pandemic. Vigyan Prasar produced daily COVID-19 Bulletin from 11 April to 06 July 2020. Thereafter, a weekly bulletin is being produced which provides details about the most important S&T updates from the country related to COVID-19. From January 2021 onwards the COVID-19 Bulletin carried news about vaccination drive initiated by the Government of India.

2. COVID-19 Explained: Short films to explain the important research findings related to COVID-19 and COVID-19 vaccination in layman's language are produced on weekly basis. The topics chosen for COVID-19 Explained cater to the curiosity of common man towards COVID-19.

3. Facebook live sessions on interviews of various stakeholders on COVID-19 Vaccination programme.



4. Facebook and India Science live sessions on interviews with experts on COVID-19 Vaccination.

5. Live Phone in programme: A live phone in programme on COVID-19 vaccination is telecasted from India Science on every Monday and Tuesday. Experts from the field give answers to the questions related to COVID-19 vaccination received from the audience.

6. India Science started "Corona Ko Harana Hai" from April, 2021. In this programme India Science team take interview on COVID-19-related different issues with top medical professionals of the country.

7. India Science makes infographics on COVID-19-related different issues regularly.

8. COVID-19 Vaccine: Fact File also telecast every Saturday from India Science.

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COVID-19 in Children: Threats & Precautions – An outreaching effort by CSIR-NIScPR

CSIR-National Institute of Science communication and Policy Research (NIScPR), New Delhi organized a half-day online session on COVID-19 in children on 4 June 2021. The session was focused on the recent second wave outbreak and the impact of COVID-19 on children, threats and necessary protocols required for the safety of children. The Chief Guest of the webinar was Dr V. Vijayalakshmi; Additional Commissioner (Academics), KVS (HQ), New Delhi and the Guest speaker was Prof. Dr R. Somasekar, Professor of Paediatrics, Sree Balaji Medical College & Hospital (SBMCH), Chennai, Tamil Nadu and Executive Board Member 2021, Indian Academy of Paediatrics (IAP).

Dr Ranjana Aggarwal, Director CSIR-NIScPR, in her introductory remarks highlighted the incredible bonding between two great institutions, the Council of Scientific & Industrial Research (CSIR) and the institute with Kendriya Vidyalaya Sangathan (KVS) in the form of JIGYASA, a student-scientist connect initiative that was kick-started in mid-2017, with the purpose of inculcating 'Scientific Temper' among school students and make them science oriented. Further, she added that the 'JIGYASA' has indeed created a commendable impact not only on the students, but also among the scientists. She said 'JIGYASA' provides opportunity for students to interact with the scientists directly and thereby motivates the young minds for innovative thinking and approach. In the long run, it is expected to deliver impressive results, especially in terms of S&T developments, which is beneficial to the society.

Dr V. Vijayalakshmi, Additional Commissioner (Academics), KVS, in her address stated that JIGYASA is like a dream coming true for the students as it provides a platform to interact with the scientists and also witness their work closely. This association has been quite successful for their institution as the students are excited about the various types of engagements that it ensures all through the year. Dr Vijayalakshmi said that the unprecedented COVID-19 pandemic has affected every sphere of our lives, most importantly social life, and passively affected the children's psyche denying them their right to play, be it with their peers, apart from their studies. She recollected how the teachers became IT-savvy technocrats overnight to cope with pressure of educating the children.

Prof. R. Somasekar, the Professor of Paediatrics from SBMCH, Chennai and EB Member, IAP, delivered a comprehensive keynote address "COVID-19 in Children: Threats & Precautions" covering minute details on the subject. He said COVID-19 in children is still moderate. Though children are vulnerable to the SARS-CoV-2 virus, still the majority of them are asymptomatic and only 1-2% had to go for hospitalization. Dr Somasekar cautioned the parents about the chances of transmission of infection from adults and the increasing gastrointestinal symptoms among children these days. He explained how to identify and differentiate COVID-19 symptoms from other flu and common cold. Dr Somasekar said that COVID-19 has so far not affected children much in India, other than the state of Karnataka, and discussed various COVID-19 treatment options for children. Taking the session forward he suggested some measures to adopt in our day-to-day life which include physical exercise, playing with kids, avoiding junk food, good sleep, wearing masks, balanced diet, and age-appropriate vaccination. Most importantly, he advised a close watch for symptoms and change in kid's behaviour.

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Website link:

https://pib.gov.in/PressReleseDetail.aspx?PRID=1724633

Kiren Rijiju releases e-book on 20 Medicinal Plants for Covid-19 Care

Minister of State for Ayush (IC), Shri Kiren Rijiju, released an e-book on 20 Medicinal Plants for Covid-19 Care on 8 June. National Medicinal Plants Board (NMPB) has prepared this e-book to highlight important medicinal plants and their therapeutic properties. These medicinal plants are useful in prevention and management of COVID-19 along with standard of care.

The herbs described in the e-book can be used in conditions leading to fever, cough, cold, weakness, pain etc. The botanical names, regional names, chemical constituents, therapeutic

values, pharmacological principles and important formulations are also added in this e-book. This will provide awareness and knowledge to the public on the importance and diversity of medicinal plants that are useful in prevention and management of COVID-19 along with standard of care.

While releasing the book Shri Rijiju encouraged NMPB to promote cultivation and conservation of medicinal plants throughout the country. Secretary, Ministry of Ayush, Vaidya Shri Rajesh Kotecha appreciated the efforts of NMPB for cultivation, conservation and marketing of medicinal plants throughout the country. Dr J.L.N. Sastry, CEO, NMPB emphasized to create the awareness among local masses for better understanding about the usage of herbal medicines.

Website link:

https://pib.gov.in/PressReleasePage.aspx?PRID=1725423

Decision to increase gap between Covishield doses taken on scientific evidence in a transparent manner: NTAGI

On 16 June, Chairman of India's COVID-19 Working Group of the National Technical Advisory Group on Immunisation (NTAGI), Dr N.K. Arora, spoke to DD News on India's COVID-19 vaccination drive.

Dr N.K. Arora explained that the decision to increase the gap between two Covishield doses from 4-6 weeks to 12-16 weeks lay in the fundamental scientific reason regarding behaviour of adenovector vaccines. "In the last week of April, 2021 the data released by Public Health England, United Kingdom's executive agency of the Department of Health, showed that vaccine efficacy varied between 65-88% when the interval is 12 weeks. This was the basis on which they overcame their epidemic outbreak due to the Alpha variant. The UK was able to come out of it because the interval they kept was 12 weeks. We also thought that this is a good idea, since there are fundamental scientific reasons to show that when the interval is increased, adenovector vaccines give better response. Hence the decision was taken on May 13, to increase the interval to 12-16 weeks." This also gives flexibility to the community, since everyone cannot come at precisely 12 weeks or so, he added.

He empathically highlighted the fact that the decision to increase the gap between two doses of Covishield vaccine was taken based on scientific evidence. "We have a very open and transparent system where decisions are taken on scientific basis. The COVID Working Group took that decision, with no dissenting voice. This issue was then discussed threadbare at an NTAGI meeting, again with no dissenting notes. The recommendation was that the vaccine interval has to be 12-16 weeks."

Dr Arora said that the earlier decision of four weeks was based upon the bridging trial data available then. He also cited that the increase in gap between two doses was based on studies that showed higher efficacy with increase in gap. "Initial studies on Covishield were very heterogeneous. Some countries like the UK went for a dose interval of 12 weeks when they introduced the vaccine, in December 2020. While we were privy to this data, when we had to decide our interval, we went for four weeks interval based on our bridging trial data which showed good immune response. Later we came across additional scientific and laboratory data, based on which after six weeks or so, we felt we should increase the interval from four weeks to eight weeks, since studies showed that vaccine efficacy is about 57% when it is four weeks and about 60% when it is eight weeks."

Speaking about why the NTAGI did not increase the gap earlier to 12 weeks, he said, "We decided we should wait for ground-level data from the UK (the other biggest user of AstraZeneca vaccine)."

He also said that there were other examples like Canada, Sri Lanka and few other countries which are using 12-16 weeks interval for AstraZeneca vaccine which is same as Covishield.

Protection from Single Dose versus Two Doses:

Dr Arora explained how emerging evidence and reports regarding efficacy of partial vs. full immunization were being considered by NTAGI. He stated, "2-3 days after we took the decision to increase the dosage interval, there were reports from UK that single dose of AstraZeneca vaccine gives only 33% protection and two doses give about 60% protection; discussion has been going on since mid-May whether India should revert to four or eight weeks."

He also said that it was decided to establish a tracking platform to assess the impact of the vaccination programme. "When NTAGI took this decision, we also decided that India will establish a vaccine tracking platform to assess not only the impact of the vaccination programme, but also type of vaccine and interval between doses, and what happens when someone is fully/partially immunized. This is very important in India since around 17-18 crore people have received only one dose, while around 4 crore people have received two doses."

Dr Arora referred to a study by PGI Chandigarh which compared effectiveness of partial vs. full immunisation. "A PGI Chandigarh study very clearly shows that vaccine effectiveness was 75% for both partially immunized and fully immunized. So at least in the short run, effectiveness was similar whether you are partially or fully vaccinated. This was in relation to the Alpha variant which had swept Punjab, Northern India and came to Delhi. This also meant that even if you received only one dose, still you are protected."

Results from CMC Vellore study are similar, he says. "Few days back, another very important study by CMC Vellore, Tamil Nadu which covers most of the current epidemic wave India experienced in April and May, 2021 shows that if somebody is partially immunized, vaccine effectiveness of Covishield is 61% and with two doses, the effectiveness is 65%, and there is very little difference, especially since there is some degree of uncertainty involved in these calculations."

On-going Studies and Monitoring of Vaccine Efficacy:

Dr Arora said that besides PGI and CMC Vellore studies, two other studies are coming up from two different organizations within Delhi. "And both these studies show that breakthrough infection with one dose is around 4%, and around 5% with two doses, basically hardly any difference. And the other study shows that 1.5-2% breakthrough infections."

Data from various sources will be integrated to assess and report on impact of various aspects of the vaccination programme, says Dr Arora. He added that India also has a robust system for monitoring Adverse Events Following Immunisation (AEFI).

Any proposal to reduce Covishield dosage gap?

Responding to this question, Dr Arora answered that decision will be taken scientifically, giving paramount importance to the health and protection of the community. "COVID-19 and the vaccination are very dynamic. Tomorrow, if the vaccine platform tells us that a narrower interval is better for our people, even if the benefit is 5-10%, the Committee will take the decision on the basis of merit and its wisdom. On the other hand, if it turns out that the current decision is fine, we will continue with it." He emphasised that ultimately, the health and protection given to our community is paramount. "This is the most important thing which drives our discussions, generation of new scientific evidence and decision-making", he stressed.

Website link:

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1727408

Delta Plus is not yet classified as Variant of Concern

In the context of the public discourse regarding detection of new variants, Member (Health), NITI Aayog, Dr V.K. Paul has reminded the public that the newly detected Delta Plus Variant is not yet classified as a Variant of Concern. "The present status is that yes, a new variant has been found. This is as of now a Variant of Interest (VoI), not as yet classified a Variant of Concern (VoC). VoC is one in which we have understood that there are adverse consequences to humanity, which could be due to increased transmissibility or virulence. We do not know at this moment this about the Delta Plus variant." Dr Paul stated this, while addressing the COVID-19 Media Briefing at National Media Centre, PIB Delhi earlier this week.

The way forward: Watch, detect, respond

The way forward is to watch for its potential presence in the country and take the appropriate public health response, says Dr Paul. "We need to watch the effect of this change, this variant in a scientific manner; this has been found outside our country. We need to monitor it through The Indian SARS-CoV-2 Consortium on Genomics (INSACOG) in order to assess and detect its potential presence and growth in our country. This is the way forward in relation to the virus." Dr Paul also mentioned that this will be an important area of future work for our comprehensive system of almost 28 laboratories. The system will constantly watch this and study its significance. This is something which science should and will watch and understand, added Dr Paul.

"No precision weapon to shoot the variants away."

Dr Paul said that this variant is a reminder about the importance of infection control and containment measures and behaviour. "Remember that there is no way that we can shoot these variants away, to use any precision weapon to ensure that they don't appear in future. What we need to do is to monitor, understand their behaviour and mount an appropriate response, being conscious of their effects on us. The appropriate response includes the same principles, namely containment measures and COVID-appropriate behaviour."

He spoke of the importance of addressing the root cause and breaking the chain of transmission. "One of the important tools to tackle any new variant is by following COVID-appropriate behaviour. The root cause is the chain of transmission. So, if we are able to address the root cause and break the chains of transmission, we will be able to contain the spread, whichever the variant may be."

Errors in replication can lead to emergence of Variants of Concern

Explaining the origin of the Delta Plus variant, Dr Paul said, "During the second wave, Delta variant - B.1.617.2 exhibited its effect; its higher transmissibility played a major role in making

the wave intense. Along the same line, an additional mutation has been detected, which has also been submitted to the Global Data System. This has been referred to as the 'Delta Plus' or 'AY.1' variant. The variant was observed in Europe in March and has been notified and brought into public domain on June 13, just two days ago."

He went on to explain that mRNA viruses are particularly predisposed to errors in their replication. When errors in replication of their RNA happen, the virus acquires a new character to a certain extent. "At times, it could be significant from the point of view of the disease; it could be in a region such as the spike protein through which the virus attaches to cells in the body. So, if that part becomes smarter than the previous version, it is to our disadvantage. So we are worried about such variants."

Website link:

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1727444

DRDO Secretary informs setting up of 850 oxygen plants in various districts of the country

A total of 850 oxygen plants are being set up in various districts of the country from PM Cares Fund for catering to the needs of the country to fight the pandemic COVID-19, Dr C Satish Reddy, Secretary, Defence Research & Development Organisation (DRDO), highlighted at the Department of Science & Technology (DST) Azadi Ka Amrit Mahotsav Discourse Series. He added that DRDO was prepared to provide all kinds of support when the need arises, and more flying hospitals would be ready, as was provided by DRDO in the second wave of COVID-19.

He also underlined how DRDO is primarily carrying out research in advanced technology in defence and also concentrating on developing high-quality technology at lower cost to match international level to be beneficial for the people. Dr Reddy was speaking at the online discourse series New India @ 75, organised by National Council for Science & Technology Communication and Vigyan Prasar.

Prof Ashutosh Sharma, Secretary, DST talked about various steps taken by the Central Government and the DST to fight the pandemic, and how to keep vaccines safe and to ensure it reaches every nook and corner of the country. He also spoke about ways in which Artificial Intelligence (AI) could play a greater role in fighting the pandemic.

"Technologies have been developed for storing and transporting vaccines to every nook and corner of the country. New ways of storing vaccines have been developed as per the Indian

conditions. Convergence of technologies is the future, and AI can play a great role in diagnostics, telemedicine and will have tremendous importance in remote monitoring, diagnostics and decision-making in fighting pandemic," Prof. Sharma said.

Speaking about the 50 years of DST, he pointed out that it has been a long journey, and foundational technology has been seeded, establishing DST as a nursery to help, nurture and grow young talents for the progress and development of the country.

Website link:

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1726975

COVID 2021: Nation's S&T Efforts Against COVID-19 – An e-Newsletter on COVID-19

In 2020, India dealt with the first wave of COVID-19 pandemic with collective measures, scientific approach, and awareness. Undoubtedly the second wave of the pandemic is testing our patience and the extent to which we can tolerate its fangs. The impact of the second wave has seen shortage of medical oxygen across the nation. But, the intelligent use of technology and well-planned resource allocation to tackle the new wave of the pandemic has been dealt with at a war-footing. The current edition, COVID 2021: Nation's S&T Efforts Against COVID-19, has been compiled to inform our readers and strengthen the usefulness of any published information.

To bridge the gap among scientific contributions, leadership and administrative efforts, and the perspective of the general public, Vigyan Prasar is continuously reaching out to its audiences in the shape of a regular e-newsletter, taking its mandate of science communication, popularisation and extension to the next level. Our effort is firmly based on the fact that "Science gathers knowledge faster than society gathers wisdom". The steady increase in the number of recoveries and the significant and continuous decrease in positivity rate provide us the much-needed assurance that this may be the outcome of improving the health infrastructure and making health the cornerstone at the policy level. The e-Newsletter aims to be a handy guide to scientists, researchers, and scholars, especially those who are interested.

Contact Info:

covidnewsletter@vigyanprasar.gov.in

Website link:

https://www.indiascienceandtechnology.gov.in/covid-19-the-pandemic/newsletter-archive

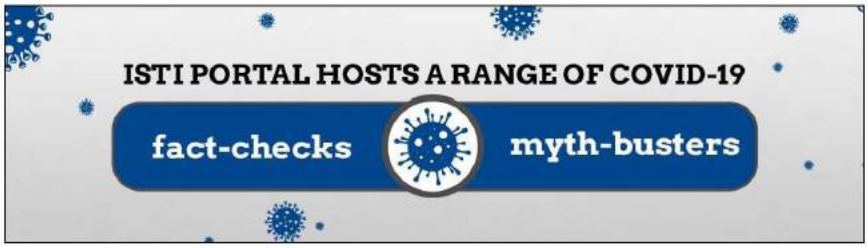
Outreach initiatives through India Science, Technology and Innovation (ISTI) Web Portal

The India Science, Technology and Innovation Portal (ISTI) is a one-stop window for information about developments in India on science, technology, and innovation, with the vision of providing a single-window source of information on a web portal about all data related to the Indian STI

Ecosystem by aggregating information on scientific inputs and outputs, bringing stakeholders together and disseminating science, technology & innovation content. The portal focuses on bringing all stakeholders and Indian STI activities on a single online platform; helping efficient utilisation of resources; highlighting functioning of scientific organisations, laboratories and institutions; aggregating information on science funding, fellowship and award opportunities spanning from school to faculty level; pooling together conferences, seminars and events; and projecting science in India with its major achievements. The ISTI web portal has been developed by Vigyan Prasar, an autonomous organisation of the DST.

In the critical times of outbreak of COVID-19 pandemic, the web portal serves as a one-stop online information guide to bring together a collection of resources in response to COVID-19. These resources are generated by efforts made by numerous initiatives and schemes taken up by several Departments and Ministries of Government of India and numerous institutions spread across the country. The content presented here relies on the best available scientific understanding of the disease and its transmission.

The web portal provided all information related to COVID-19, from presentation of symptoms, to vaccine science and distribution strategy. It contains content on fact-checks and myth-busters in questions & answers format, contributions from research fraternity, start-up spotlights, industry collaborations, communications and resources, reaching out to society and so on. A dedicated focus has been given on exhibiting funding opportunities catering to the second wave of the COVID-19 pandemic.



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Website link:

https://www.indiascienceandtechnology.gov.in/

Press Information Bureau releases daily bulletin on COVID-19

Press Information Bureau (PIB), Government of India releases a daily bulletin on COVID-19, starting from early days of COVID-19 outbreak. The bulletin contains press releases concerning COVID-19, issued in last 24 hours, inputs from PIB field offices, and fact checks undertaken by PIB. These bulletins are published in 14 languages, namely Hindi, English, Urdu, Marathi, Telugu, Tamil, Punjabi, Bangla, Kannada, Oriya, Gujarati, Assamese, Malayalam and Manipuri. The following data-points were released on 22 June 2021.

India administered 86.16 lakh vaccine doses in a single day; Highest ever single day vaccination achieved in the world so far
28.87 Cr. Vaccine Doses administered so far under Nationwide Vaccination Drive
India reported 42,640 new cases in the last 24 hours; less than 50,000 in 91 days
India's Active Caseload declines to 6,62,521; less than 7 lakh after 79 days
2,89,26,038 Total Recoveries across the country so far
81,839 patients recovered during last 24 hours
Daily recoveries continue to outnumber the Daily New Cases for the 40th consecutive day
Recovery Rate increases to 96.49%
Weekly Positivity Rate remains below 5%, currently at 3.21%
Daily positivity rate at 2.56%, less than 5% for 15 consecutive days

Website link:

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1729475

Government of India presents regular COVID-19 India factsheet and immunisation programme

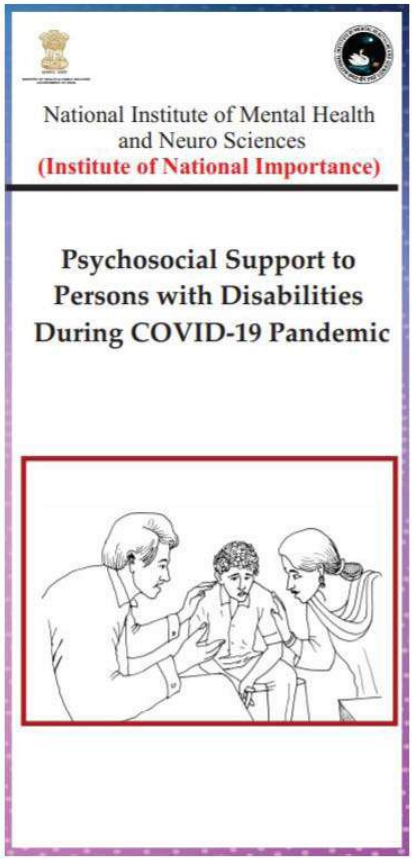
India's coronavirus cases have crossed 3 crore, and as on 23 June 2021, 08:00 AM it stands at 3,00,28,709 cases out of which 2,89,94,855 have recovered. The recovery rate stands at 96.56% while the case fatality rate stands at 1.30%.

Government of India has so far provided, both through the free-of-cost category and through direct-state-procurement category, more than 29 crore vaccine doses (29,46,39,511) to States/ UTs.

Website link:

https://www.mygov.in/covid-19

Psychosocial Support to Persons with Disabilities During COVID-19 Pandemic, a source book released by NIMHANS-Bengaluru



Many persons with disabilities have pre-existing health conditions that make them more susceptible to contracting the virus, experiencing more severe symptoms upon infection, leading to elevated levels of death. During the COVID-19 crisis, persons with disabilities who are dependent on support for their daily living may find themselves isolated and unable to survive during lockdown measures, while those living in institutions are particularly vulnerable, as evidenced by the overwhelming numbers of deaths in residential care homes and psychiatric facilities. Barriers for persons with disabilities in accessing health services and information are intensified. Persons with disabilities also continue to face discrimination and other barriers in accessing livelihood and income support, participating in online forms of education, and seeking protection from violence.

National Institute of Mental Health and Neurosciences (NIMHANS) released a brochure about Psychosocial Support to Persons with Disabilities During COVID-19 Pandemic. Awareness of these risks leads to better responses that can allay the disproportionate impact experienced by persons with disabilities.

Website link:

https://nimhans.ac.in/wp-content/uploads/2021/03/Psychosocial-Support-to-Persons-with-Disabilities-During-COVID-19-Pandemic.pdf

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9

COVID FACT-CHECKS

This section attempts to answer frequently asked questions (FAQs) on various aspects of the COVID-19 disease, its meeting out the second wave, and subsequently busting the myths spread in the society.

SECTION GUIDELINES

1. The Third Wave of COVID-19 in India and Protecting Children
2. COVID-19 and White Fungus Infection
3. Related to Use of Oxygen during current COVID-19 Pandemic
4. Related to drugs and medications fighting the disease
5. Related to Black Fungus and COVID-19 Disease
6. Related to Indoor Air and COVID-19 Disease

1. The Third Wave of COVID-19 in India and Protecting Children

Q. What is the possibility of a third wave of COVID-19 in the coming months?

A. Pandemics are likely to occur in multiple waves, and each wave could vary in the number of cases and its duration. Eventually, most of the population may get immune by asymptomatic or symptomatic infections (herd immunity). Over time, the disease may die out or may become endemic in the community with low transmission rates.

Key Message: There is a possibility of a third wave, but it is difficult to predict its timing and severity.

Q. Are children at greater risk if the third wave strikes?

A. In the first wave, primarily the elderly and individuals with co-morbidities were affected with severe disease. In the current (second) wave, a large number of younger population (30-45 years) have developed severe disease as also those without co-morbidities. After the second wave is over, if we do not continue following COVID-appropriate behaviour, the third wave, if occurs, is likely to infect the remaining non-immune individuals and that may include children also. The latest serosurvey (Dec 2020, Jan 2021) showed that the percentage of infected children in the age group of 10-17 years was around 25%, the same as adults. This indicates that while children are being infected like adults, they are not getting the severe disease.

Key Message: Children are as susceptible as adults and older individuals to develop an infection but not a severe disease. It is highly unlikely that the third wave will predominantly or exclusively affect children.

Q. Are children likely to suffer from severe disease as being witnessed in the adult population in the current wave?

A. Fortunately, children have been relatively less affected so far due to several factors. The most important reason is the lesser expression of specific receptors to which this virus binds to enter the host and also the immune system of the children. A very small percentage of infected children may develop moderate to severe disease. If there is a massive increase in the overall numbers of infected individuals, a larger number of children with moderate to severe disease may be seen. Apart from the infection, parents should watch out for mental health issues in children and keep a watch to prevent child abuse and violence. Also, it is worth limiting screen time and prepare children for safe school reopening as per the Indian Academy of Pediatrics (IAP) guidelines.

Key Message: Almost 90% of the infections in children are mild/asymptomatic. Therefore, the incidence of severe disease is not high in children.

Q. Can we rule out the possibility of severe infections in children in the third wave?

A. As explained, the spectrum of illness is likely to be much less severe in children than adults; there is only a remote possibility of children being more severely affected than adults in the next wave. As per data collected during the first and second waves, severe COVID infections in children were not reported and only in few cases they were admitted to ICU. However, we

need to be watchful about how the mutant strains will behave. The dictum here is better be ready and prepared for the worst and hope for the best!

Key Message: Severe COVID cases in children are rare. Further, there is no evidence indicating that children will have severe disease in the third wave.

Q. Severe disease due to COVID-19 is already occurring in children. Why it is so?

A. Yes, a severe illness related to COVID-19 is known to occur in children. This includes pneumonia and Multisystem inflammatory syndrome in children (MIS-C). However, COVID pneumonia in children is uncommon as compared to adults. In some cases, after 2-6 weeks of asymptomatic or symptomatic COVID-19 infection, MIS-C may be seen due to immune dysregulation with the incidence of 1-2 cases per 100,000 population; some of these cases also may be severe. It's a treatable condition with a good outcome if diagnosed early. Also, most children suffering from MIS-C cannot transmit the infection to others.

Key Message: Children occasionally get the severe disease and may need ICU care, both during the acute illness and after 2-6 weeks due to MIS-C caused by COVID-19. But the majority are likely to recover if treated on time.

Q. What preparations are being made in case the 3rd wave comes and affects the children?

A. Most affected children get a mild disease with fever and need supervised home care with monitoring. We have learned a lot about COVID-19 illness from our shared experiences in adult medicine in the last 15 months. IAP guidelines on the management of COVID-19 in children are in place, and paediatricians have been sensitized and trained on its management. We need to be ready for a more significant number of patients seeking consultations; educating the parents on different platforms regarding illness and warning signs; and arranging more COVID wards for children with more special wards such as high-dependency units (HDU) and intensive care units (ICU). The preventive behaviours are the same for children. Parents should also be ideal role models for their children regarding mask etiquette, hand hygiene, and social distancing. Children above the age of 2 to 5 years can be trained to use a mask; however, the adults have to follow the COVID-appropriate behaviour. IAP has also set guidelines for the safe reopening of schools for the safety of the children.

Key Message: We need to be prepared with more in-patient beds and intensive care beds for children. IAP has already developed the management protocol for disease categories in children. There is no reason to panic. Our preparations are in full swing.

Q. What is the plan for vaccinating children?

A. So far, the global data show that compared to children, older adults are a thousand times more likely to die from COVID-19 disease. So, it has been a priority to vaccinate the high-risk elderly age group first. Thereafter, the emphasis should be on adults who also have more severe diseases as compared to children. When there is the remote possibility of children getting affected, some countries consider vaccinating children and adolescents. The same vaccines being used in adults can be used in children only after adequate trials. One of the India-made vaccines will soon undergo trials in children, and if proven immunogenic and safe, it could be fast-tracked for mass vaccination in children.

Key Message: Children do get the severe disease, even if the number is small. Thus, there is no harm in considering vaccination for them. The safety and efficacy, however, are being assessed in trials for this age. The national Expert Group on Vaccine Administration for COVID-19 will develop a plan as and when new scientific data emerge.

Source

https://iapindia.org/pdf/hA5Gnpt_lQv63Bk_IAP%20view%20point%20for%203rd%20wave%20Covid%2022%20May%202021.pdf

2. COVID-19 and White Fungus Infection

Q. What is White Fungus?

A. White Fungus, also known as candidiasis, is an opportunistic infection, which could spread fast to various body parts and if not treated could be serious. According to the Centre for Diseases Control and Prevention (CDC), White Fungus or invasive candidiasis can affect the blood, heart, brain, eyes, bones, or other parts of the body.

Q. Who are at high risk to get White Fungus infection?

A. The White Fungus is all around us as it is found naturally in the environment. It primarily affects people with low immunity, who come in contact with objects that contain these fungal spores. For instance, COVID-19 patients on oxygen support can come in contact with these fungal spores if their ventilators and oxygen support equipment are not sanitized properly. Further, overuse of steroids and use of tap water in the humidifier attached to an oxygen cylinder can also heighten the risk of contracting White Fungus.

Q. Who can get infected by white fungus?

A. Invasive candidiasis is caused by a yeast (a type of fungus) called Candida. Candida can normally live inside the body, in areas like the mouth, throat, gut, and vagina, without causing any problems. However, individuals with low immunity, like patients recovering from a serious COVID-19 infection, are particularly at risk of contracting this fungal infection. In their bodies, the fungus can enter the bloodstream or internal organs to cause an infection.

People who are at high risk for developing this infection include:

- Have been admitted in the intensive care unit (ICU) for a prolonged period;
- Have weakened immune system (for example, people on cancer chemotherapy, people who have had an organ transplant, and people with low white blood cell counts);
- Have recently had surgery, especially multiple abdominal surgeries;
- Have recently received lots of antibiotics or steroids in the hospital;
- Receive total parenteral nutrition (food through a vein);
- Have kidney failure or are on hemodialysis;
- Have diabetes;
- Have a central venous catheter.

Q. Is White Fungus contagious?

A. White Fungus is not contagious in most cases, as it cannot spread directly from person to person. However, there exist some species of fungus that cause this infection on the skin. In

such instances of external infection, the fungus can possibly be transferred from the patient to another individual who is at risk.

Q. What are the symptoms of White Fungus?

A. Only CT scans or X-Rays can reveal and completely confirm the White Fungus infection. Health experts report that it is more dangerous than Black Fungus, as it affects the lungs as well as other parts of the body like the nails, skin, stomach, kidney, brain, private areas, and mouth.

Moreover, the White Fungus can also infect the lungs the same way COVID-19 does. In fact, patients who get infected with White Fungus displayed COVID-19-like symptoms despite having tested negative for the virus. According to some reports, the oxygen saturation level of one of the four patients infected with White Fungus dropped from normal levels. However, the oxygen levels became normal after the antifungal medication was administered.

Q. How can White Fungus be treated?

A. Patients infected with White Fungus should be examined carefully, perhaps with a fungus culture test of their phlegm or mucus, to detect the extent of fungal infection in their body. After detection of the infection, antifungal medications have been used to treat the patients, and they have led to an improvement in their condition. The type and dose of antifungal medication used to treat White Fungus will depend on the patient's age, immune status, location, and severity of the infection.

3. Related to Use of Oxygen during current COVID-19 Pandemic

Q. What is the normal respiratory rate of a healthy adult person?

A. Standard respiratory rates for a healthy adult range from 12 to 20 breaths per minute.

Q. Are 8 breaths per minute normal?

A. No. A patient needs to be evaluated medically.

Q. How many litres of oxygen per minute do we breathe?

A. The average tidal volume, i.e., the average amount of air inhaled and exhaled per breathing cycle, is 0.5 litre (500 ml). Minute ventilation (VE) is the total volume of air entering the lungs in a minute is 6 litres per minute.

Q. What should be the normal oxygen saturation as recorded by a Pulse Oximeter?

A. The normal oxygen saturation level in the blood (SpO2) should be 95% or higher. Some people with chronic lung disease, such as Chronic Obstructive Pulmonary Disease (COPD) or sleep apnea, may have normal levels of around 90%. The "SpO2" reading on a pulse oximeter shows the percentage of oxygen in the blood. If your home SpO2 reading is lower than 94%, call your healthcare provider.

Q. How do I check my oxygen level at home without a Pulse Oximeter?

A. If you do not have a portable finger pulse oximeter in your home, you can also learn how to assess signs and symptoms of low oxygen levels. Two classic signs of a low oxygen level are a rapid heart rate and a fast breathing rate. An average heart rate is 60–100 beats per minute and an average breathing rate is 12–20 breaths per minute. However, under low oxygen conditions, body responses include an increase in heart rate and breathing rate. Another sign of a low blood oxygen level is cyanosis or a bluish color change on your lips, nose, or fingertips. As your body loses oxygen, the blood cells in your body change colour in your bloodstream to a dark blue, which can be seen from the outside of your skin if it is severe. Cyanosis is typically a late sign of low oxygen levels and is considered a medical emergency. If you notice this bluish discolouration, you should immediately visit the nearest hospital.

Q. Do we see many cases of silent hypoxia in this wave? How can this be addressed?

A. Silent hypoxia or happy hypoxia is referred to as the early stage of COVID-19. As the oxygen level drops, one may start feeling shortness of breath, confusion, and other symptoms. Keep watching for these signs and do not ignore them. This is true for young people as well. If you monitor low oxygen level, change in lip colour from natural to blue or persistent sweating, consult the covid helpline or doctor. They could be the early sign of silent hypoxia.

Q. In brief, how can proning help enhance blood oxygen levels?

A. Proning is a medically accepted process to improve the distribution and exchange of oxygen in the lungs. A patient is safely placed from their back onto their abdomen (stomach), i.e., having face down to improve breathing and oxygenation. It has been shown beneficial for COVID-19 patients with compromised breathing comfort, especially during home isolation.

Q. Is pure oxygen used in hospitals?

A. Medical oxygen contains high purity oxygen used for medical treatments and is developed for use in human body. Cylinders contain a compressed oxygen gas and no gases are allowed in the cylinder to prevent contamination.

Q. What is the use of Medical Oxygen?

A. Oxygen is used for treatment in hospitals. Hence, it is considered a drug or a pharmaceutical product.

Q. What is the need for Medical Oxygen?

A. The human body requires oxygen to survive, and typically, we breathe in from air. However, if you have lung disease or other medical conditions such as COVID-19, you may not get enough oxygen due to compromised lungs. That can leave you short of breath and cause problems with your heart, brain, and other parts of your body.

Q. Can breathing 100 per cent oxygen harm your body?

A. Yes. Breathing 100% oxygen also eventually leads to collapse of the alveoli (atelectasis).

Q. Can you get excess (more than required) oxygen from an Oxygen Concentrator?

A. It is possible to get excess (more than required) oxygen from an oxygen concentrator. However, this is quite rare when oxygen concentrators are used as directed and prescribed. All supplemental oxygen requires a prescription from a doctor, who carefully chooses your oxygen requirement.

Q. What is the role of oxygen during COVID-19 Disease?

A. The demand for medical oxygen is increased in COVID-19 as the disease primarily affects the lungs and, in severe cases, causes death due to Acute Respiratory Distress Syndrome (ARDS) and pneumonia.

Q. When does a patient require medical oxygen in a COVID-19 positive case?

A. As per AIIMS/ICMR-Covid-19/National Task Force/Joint Monitoring Group (Dte.GHS), MoHFW, Government of India, Clinical Guidelines for Management of Adult COVID-19 Patient issued on 22 Apr 2021, moderate and severe cases of COVID-19 where the infection induces shortage of oxygen in the body due to its impact on lungs require medical oxygen and immediate oxygen therapy. Oxygen acts as a life-saver for COVID patients.

Q. What is moderate COVID-19 cases?

A. In moderate COVID-19 cases a patient has upper respiratory tract symptoms (and/or fever) with shortness of breath. They have a respiration rate more than or equal to 24/minute and SpO2 90% to 93% with ambient air.

Q. What is severe COVID-19 cases?

A. In severe Covid-19 case, a patient has upper respiratory tract symptoms (and/or fever) with shortness of breath. They have a respiration rate more than 30/minute and SpO2 less than 90% in room air.

Q. When does a patient require Mechanical Ventilator Support?

A. A patient may be put on a mechanical ventilator if it becomes very difficult to breathe or get enough oxygen into their blood. This condition is called respiratory failure. Mechanical ventilators are machines that act as bellows to move air in and out of the patient's lungs. The respiratory therapist and doctor set the ventilator to control how often it pushes air into the lungs and how much air the patient gets. The patient may be fitted with a mask to get air from the ventilator into there lungs. Or they may need a breathing tube if their breathing problem is more serious.

Q. Can Mechanical Ventilation be given at home?

A. Mechanical ventilators are mainly used in hospitals and transport systems such as ambulances and medical evacuation by air transport etc. In some cases, they can be used at home if the illness is long-term and the caregivers at home receive training and have adequate nursing and other resources at home. Being on a ventilator may make a patient more susceptible to pneumonia, damage to the vocal cords, or other problems.

Q. What is the 6-minute walk test for COPD?

A. The 6-min walk test (6MWT) is an exercise test that measures functional status in chronic obstructive pulmonary disease (COPD) patients and provides information on oxygen desaturation. This test is also being used for COVID-19. In case of COVID-19 symptoms, SpO2 level must be checked before taking a walk. Now, walk for 6 minutes without a break on an even surface and measure the SpO2 level. It may fall 1-2%, but consult a medical professional if it falls below 93%.

Source:

https://ndma.gov.in/sites/default/files/2021-03/FAQs-on-Use-of-oxygen-.pdf

4. Related to drugs and medications fighting the disease

Q. Is Remdesivir effective in the treatment of COVID-19?

A. No study has conclusively been able to prove that Remdesivir is beneficial in the treatment of COVID-19. However, India has approved Remdesivir under the National Clinical Management Protocol for COVID-19, which was developed after many interactions by a committee of experts. The protocol acts as the guiding document for the treatment of COVID-19 patients in India. Remdesivir is listed as an investigational therapy in the protocol, i.e., where informed and shared decision-making is essential, besides noting contraindications mentioned in the detailed guidelines.

Q. What Is Remdesivir? How Does Remdesivir Work?

A. Remdesivir is an investigational drug used to treat viral infections. It is classified as a broad-spectrum antiviral with potential antiviral activity against a variety of RNA viruses.

The drug works against the novel coronavirus by inhibiting replication of the virus in the body. Remdesivir functions as a prodrug that is modified in the body before it becomes an active drug. It is classified as a nucleoside analog, one of the oldest classes of antiviral medications, and resembles the RNA base adenosine. In general, nucleoside and nucleotide analogues simulate the structure of a true nucleoside or nucleotide. The simulated structure may then be incorporated into the virus. Remdesivir works when the enzyme replicating the genetic material for the novel coronavirus—RNA polymerase—incorporates the adenosine analogue in place of the natural molecule into the growing RNA strand. By introducing the modified agent, Remdesivir, replication of the novel coronavirus is interrupted, and the virus ceases to multiply and cannot infect more cells in the body.

Q. When should a patient of COVID-19 take Remdesivir?

A. The timing of the drug, when it is administered, is most important. Taking it too early or too late could do more harm than good. Remdesivir is applicable only in hospitalised patients who showed very low oxygen saturation and infiltrated their chest X-ray or CT scan. The optimal timing for Remdesivir is usually after five to seven days of having the virus. Early to mild or asymptomatic patients should not take Remdesivir. Also, it is of no use if it's given very late because it would create a cytokine storm. A cytokine storm is when the immune system goes into overdrive. The body starts to attack its cells and tissues instead of just the virus.

Q. Is Remdesivir can be taken at home?

A. Remdesivir comes in a vial and has to be injected only after prescription and in the presence of a health practitioner. It is for patients who are hospitalised and severe. Therefore, it should not be given at home. It is for patients who need to be admitted and need hospital care.

Q. Are steroids effective in the treatment of COVID-19?

A. There is no evidence to support the use of steroids in the treatment of COVID-19. World Health Organization (WHO) recovery trial showed that steroids do have a beneficial effect. But again, the timing is critical. The recovery trial clearly showed that if we give steroids too early, it showed a harmful effect before oxygen saturation. Steroids are most effective during the later part of the disease when there is more inflammation and oxygen saturation is falling. Steroids are only helpful for moderate or severe cases.

Q. Is plasma a good way to fight off COVID-19?

A. Convalescent plasma has been a therapy devised to passively transfer antibodies from a recovered person to a new patient. While the therapy has been received with different opinions by the medical community, the important aspect is timing. It's better if plasma therapy is used early before clinical worsening. Also, plasma with high titer neutralising antibodies would have better results. Hence, to achieve good results, correct patient selection, timing and a good quality plasma donor are needed for success in this form of treatment.

Q. Should a person with COVID-19 take Tocilizumab?

A. Tocilizumab is a drug of last resort. It should only be used when a COVID-19 infection in a patient is worsening despite steroids, Remdesivir and other treatments like anticoagulants. Tocilizumab is required in less than 2% of COVID-19 patients. Very few patients need this drug because it's only for treating a cytokine storm and has a limited role.

Q. Is Favipiravir effective in treating COVID-19?

A. Favipiravir is another antiviral that is being promoted for the treatment of COVID-19. It was initially doled out as a treatment of influenza after the H1N1 pandemic. There is not enough evidence in robust studies to show that it is a good drug. Since it's not a proven treatment, India's national guidelines also don't recommend its use.

Q. Is it possible to treat COVID-19 without any of the drugs mentioned above?

A. People with mild COVID-19 or those who are asymptomatic will improve with just symptomatic treatment. Mild COVID-19 infection can be treated with paracetamol, good hydration and multivitamins —without any treatment. Giving treatment when it is not required may be doing more harm than good.

5. Related to Black Fungus and COVID-19 Disease

Q. What is Black Fungus?

A. Black fungus, also known as MUCORMYCOSIS, is a rare fungal infection. It is called "black" because of the colour of the fungal growth. It is caused by exposure to mucor mould found in soil, manure, and rotten/decaying fruits and vegetables. It is ubiquitous and even present in the

nose/mucosa of healthy individuals. This disease usually affects the sinuses, eye orbit, and brain. That is why it is also called "rhino-orbital-cerebral" mucormycosis. It may be life-threatening in immunocompromised individuals (cancer patients, HIV/AIDS) and people with uncontrolled diabetes.

Q. What are the risk factors for acquiring Black Fungus infection?

A. Risk Factors are:

- Uncontrolled Diabetes Mellitus
- Treated for COVID-19 with corticosteroids
- Treated for COVID-19 with immunomodulators
- Treated for COVID-19 with mechanical ventilation
- Prolonged oxygen therapy
- Prolonged ICU stay
- Immunocompromised state

Q. Why the sudden increase in Black Fungus cases?

A. It may be triggered by extensive use of steroids, which is a life-saving treatment for moderate to severe COVID-19 infection. Steroids lower the immunity and cause a sudden up-shooting of blood sugar levels in diabetes and non-diabetic patients. For patients on humidified oxygen, care should be taken to make sure there is no water leak to prevent the growth of the fungus.

Q. How serious is Black Fungus?

A. Black fungus infection causes a vision-threatening and life-threatening condition.

Q. Do all COVID-19 patients need to be worried about Black Fungus infection?

A. No. As discussed, high-risk patients need to be alert. Also, during COVID-19 recovery, everyone should watch out for early signs and symptoms.

Q. What are the precautions one can take to avoid this disease?

A. Following precautions one can take:

- Boost immune system with diet, hydration and exercise.
- Rational use of steroids by follow guidelines.
- Strict Blood sugar monitoring and control in all patients who are on steroids.

Q. What are the early signs of Black Fungus?

A. some of the early signs are:

- Facial pain
- Facial swelling/puffiness/discolouration
- Sinus headache
- Stuffy nose

- The blurring of vision/decreased vision
- Double vision
- Drooping of eyelid
- Blood-stained nasal discharge
- Dental pain

Q. Is Black Fungus treatable?

A. Yes. Early diagnosis and a prompt multi-speciality team of medical professionals can manage it.

Q. Which specialist should I visit for Black Fungus?

A. ENT and eye specialists are central to this disease. The team includes care coordination with neurosurgeon endocrinologist and microbiologist.

Source:

https://www.eyeqindia.com/frequently-asked-questions-on-covid-and-black-fungus/#toggle-id-9

6. Related to Indoor Air and COVID-19 Disease

Q. Will running an evaporative cooler help protect my family and me from COVID-19?

A. Evaporative coolers (or "swamp coolers") can help protect people indoors from the airborne transmission of COVID-19 because they increase ventilation with outside air to cool indoor spaces. Evaporative coolers are used in dry climates. They use water to provide cooling and improve relative humidity in indoor microenvironments. When operating as intended (with open windows), these devices produce substantial increases in ventilation with outdoor air. Some evaporative coolers can be performed without using water when temperatures are milder to increase ventilation indoors. Avoid using evaporative coolers if air pollution outside is high and the system does not have a high-efficiency filter.

Q. Is ventilation important for indoor air quality when cleaning and/or sanitising for COVID-19 indoors?

A. When cleaning and disinfecting for COVID-19, ventilation is essential—in general, increasing ventilation during and after cleaning help to reduce exposure to cleaning and disinfection products and by-products. Increasing ventilation, for example, by opening windows or doors, can also reduce risks from particles resuspended during cleaning, including those potentially carrying SARS-CoV-2 (or other contaminants). Avoid ventilation with outdoor air when outdoor air pollution is high or when it makes your home too cold, hot, or humid.

Q. Will an air cleaner or air purifier help protect my family and me from COVID-19 in my home?

A. When appropriately used, air purifiers can help reduce airborne contaminants, including viruses, in a home or confined space.

Q. How can I increase ventilation at home to help protect my family from COVID-19?

A. Ensuring proper ventilation with outside air is a standard best practice for improving indoor air quality. To increase ventilation in your home, one can:

- Open the windows or screened doors, if possible;
- Operate an air conditioner that has an outdoor air intake or vent; and
- Operate a bathroom fan when the bathroom is in use and continuously, if possible.

However, the practices mentioned here are not enough to protect people from COVID-19. When used along with other best practices recommended by the Ministry of Health and Family Welfare, Govt. of India, the above methods can be part of a plan to protect yourself and your family.

Source:

https://www.epa.gov/coronavirus/indoor-air-and-coronavirus-covid-19

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FEEDBACK FORM

COVID-19

Science & Technology Efforts in India

It has been more than a year since the COVID e-Newsletter started reaching you and we want to hear what you think about it. The information product is designed to keep you conversant about the services and efforts the country has put up on the face of the sudden eruption of the COVID-19 pandemic. Your opinion is vital so that we can make sure we are including what you want to read. Please fill in the form below and rest assured that the information you give will help shape future editions of your coveted newsletter.

I. How do you rate the following aspects of COVID 2021 e-Newsletter, focused on the second wave of the pandemic?

1. The overall appearance

😄Very Good 😊Good 😐Average ☹️Poor 😞Very Poor 😶No Opinion

2. Ease to read and flow of information

😄Very easy 😊Fairly easy 😐Not very easy ☹️Not at all easy

For suggestions and feedback, click at:

https://www.indiascienceandtechnology.gov.in/covid-newsletter/feedback-form

COVID-19

Science & Technology Efforts in India

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TOGETHER WE CAN AND WE WILL BEAT THE PANDEMIC OUT

For suggestions and feedback, write to us at: covidnewsletter@vigyanprasar.gov.in

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