Preventive and Therapeutic Approaches in Medical Departments During the COVID-19 Pandemic

Authors:

Saeme Azizi Hassan Abadi
Islamic Azad University Of Chalus

Raihaneh Atbaei
Jahrom University of Medical Sciences

Hajar Ghasemi Falaverjani
Shahid Beheshti University of Medical Sciences

Mahtab Forouhi
Shahid Beheshti University of Medical Sciences

Reza Moazamiyanfar
Pharmaceutical Sciences Branch, Islamic Azad University (IAUPS)

Mehdi Rezaei
Shiraz University of Medical Sciences

Sasan Pourbagher Benam
Urmia University of Medical Sciences

Zahra Ataei Jafari

Tehran University of Medical Sciences

Kimia Karimi Taheri
Shahid Beheshti University of Medical Sciences

Elmira Jafari Afshar
Alborz University of Medical Sciences

Parham Samimisedeh
Alborz University of Medical Sciences

Arian Afzalian
Tehran University of Medical Sciences

Sanaz Varshochi
Tehran University of Medical Sciences

Parisa khoshdoz
Guilan University of Medical Sciences

Ghazal Rafiei
Shiraz University of Medical Sciences

Fatemeh Hojabri Fard
Shahid Beheshti University of Medical Sciences

Seyyed-Ghavam Shafagh
Iran University of Medical Sciences

Fatemeh Jalalifar
Jiroft University of Medical Sciences

Mozhgan Afsharfar
Islamic Azad University, South Tehran Branch

Maryam Yazdani Tabrizi
Shahid Beheshti University of Medical Sciences

Reza Bemana
Jahrom University of Medical Sciences

Alireza Khodadadiyan
Shiraz University of Medical Sciences

Mohammad Pirouzbakht
Kerman University of Medical Sciences

Amirhossein Tayebi
Alborz University of Medical Sciences

Ali Shabbak
Guilan University of Medical Sciences

Aryan Madady
Alborz University of Medical Sciences

Babak Roshanravan
Birjand University Of Medical Science

Sheida Khosravaniardakani
Shiraz University of Medical Sciences

Parisa Masoudikabir
Shahid Beheshti University of Medical Sciences

Yalda Azarnia

Shiraz University of Medical Sciences

Amir Shahriyar Rambod Rad

Mashhad University of Medical Sciences

Moein Motioleslami
Isfahan University of Medical Sciences

Homa Behmadi
Agricultural Research, Education and Extension Organization

Payam Forghani Torbaghan
Mashhad University of Medical Sciences

Shamimeh Hashemzadeh
Mashhad University of Medical Sciences

Niloufar Bineshfar
Shahid Beheshti University of Medical Sciences

Alireza Mirahmadi
Shahid Beheshti University of Medical Sciences

Mohammad Saeed Kahrizi

Alborz University of Medical Sciences

Yasaman Niakan

University of Central Lancashire

Fatemeh Taheri

Islamic Azad University Pharmaceutical Sciences Branch

Publisher: Kindle

Publication Date:
March, 2022

Language: English

Dimensions: 5 x
0.39 x 8 inches

CONTENTS

Chapters:

1. PREVENTIVE AND THERAPEUTIC APPROACHES TO NEUROSURGICAL AND NEUROLOGICAL DISEASES DURING THE COVID-19 PANDEMIC

Introduction

The COVID-19 pandemic has raised significant dangers to public health and life across the world. By April 2020, nearly 1,645,428 patients with COVID-19 were approved worldwide and nearly 7347 patients were reported from India. Despite critical healthcare measures conducted by different governments, the projected effect of coronavirus infection falls to 2%. Therefore, it

is important to curtail the infection, rationalize the application of resources, and manage the case rush in the given scenario.

The manifestations vary with every case. The common “cytokine storm” elicited depends on the immune dysregulation rather than the peak viremia. This triggers insufficient and a late-type I interferon (IFN) response which causes aberrant proinflammatory cytokine production by alveolar macrophages and the next CD4, CD8 T cell dysfunction. There is a significant rise of 14 cytokines in COVID-19 cases and there are high levels of three cytokines (CXCL 10, CCL7, and IL-1 receptor antagonist) which are correlated with elevated viral load, loss of lung activity, lung impairment, and a possibly fatal outcome.

The common clinical symptoms of COVID-19 positive cases are fever, cough, and dyspnea.

However, several cases present with neurological manifestations, such as vomiting, headache, dizziness, and delirium. Anosmia and ageusia can also be early manifestations. The diagnosis and severity of disease are based on the SARS-CoV-2 recommendations by WHO. The cases are categorized into five stages of severity: mild illness, pneumonia, severe pneumonia, acute respiratory distress syndrome (ARDS), and septic shock. An investigation by Gautret et al. have revealed that combined treatment with azithromycin and hydroxychloroquine considerably decreases the viral load from the COVID-19 positive patients. The COVID-19 cases may be treated by hydroxychloroquine or chloroquine or lopinavir/ritonavir or combination of HCQ and lopinavir.

The COVID-19 pandemic has raised great at-

tentions for both neurologists and neurosurgeons in the world. The novel-SARS-CoV-2 has been directly corelated with acute hemorrhagic necrotizing encephalopathy or may also lead to central nervous system (CNS) infection together with general inflammation. Restricted clinical investigation has a great effect on patients' mental and physical status and thus becomes even more challenging to treat cases with CNS disorders. The condition regarding COVID-19 is rapidly changing and dynamic. Although timely policies have been laid down by the provinces and central governments to facilitate case decision-making, such directives will inevitably require to be adapted to this ever-changing environment. The policies laid down by the government and individual medical centers aim to provide efficient resource management

to tackle the sudden surge of cases, treatment of cases which need immediate neurosurgical intervention and engaging in neurosurgical investigation during the COVID-19 outbreak. The infectivity period may initiate several days before the person becomes symptomatic. They can spread the infection in the preclinical level. This increases the risk of healthcare personnel. This book aims to provide comprehensive suggestions for neurological and neurosurgical case management, efficient resource management, and protecting the healthcare personnel during the COVID-19 epidemic. These suggestions aim to reduce infections to physicians, nurses, and paramedical personnel of the neurology and neurosurgery division and fight the novel coronavirus infection.

Suggestions for Patient Management

According to experimental and clinical investigations the incubation period of the n-CoV-SARS2 ranges from 3–14 days henceforth, every case presenting for treatment should be managed as a potential asymptomatic infected patient. History regarding respiratory illness, international travel and/or, contact with COVID-19 cases should be reported in every patient sheet separately. All cases, as well as their attendants, should be monitored for COVID-19 before entering the emergency department. Any cases suspected of COVID-19 should be immediately separated while emergency management is being performed. All physicians/nurses/paramedical personnel are suggested to use surgical scrubs along with a plastic apron, face masks,

and other protective instruments as necessary while in the triage unit. They should use PPE, N95 masks as well as a face visor while evaluating/intubating suspected or proven COVID-19 cases in the emergency. A dedicated operating room (OR) and the same anesthesia machine should only be applied for COVID-19 positive patients for the duration of the epidemic. The risk of aerosol dispersion is maximum during intubation, therefore it has been proposed that the whole face skin may be covered by a transparent sheet and the hands may be inserted under the sheet to intubate the cases, while the edges should be stuck to the surface. Alternatively, the application of a transparent Perspex square box has been proposed which is placed over the patient's head and has two ports for the anesthesiologist to insert his/her arm so that the

whole intubation may be conducted inside the box. A preferred guideline is the application of a separate room for intubation and then bringing the case to the OR, so the risk is reduced to the surrounding health care provider. The cases should be categorized based upon priority (i) acute (needing immediate management/surgery within 24 h.) (ii) sub-acute (needing management within a maximum of 7–10 days) or (iii) chronic (needing management within a month). The COVID-19 positive cases should be strictly treated according to the WHO recommendations.

Acute Patients

A pulmonary computed tomography (CT) scan and nucleic acid sequencing (RT-PCR) of throat

swab are suggested in all patients, again subject to the National/Government recommendations. However, these evaluations may be ceased and a direct surgical intervention may be carried out. The surgical indications should be rigorously assessed and surgical management should be preserved for cases with an emergency condition such as intracranial hemorrhage, considerably raised ICP, ruptured aneurysm. COVID-19 positive or suspected cases should be managed in the dedicated OR. In acute stroke cases needing mechanical thrombectomy at least, chest X-ray should be conducted if not pulmonary CT scan while shifting to the intervention room without causing a delay in treatment and intervention in COVID-19 suspect patients should also be performed in separate dedicated intervention room. Pre-op and Post-op transfer from

the ward to the OR and back should be carried out by the ward nurses in full personal protective equipment (PPE) including a well-fitting N95 mask, goggles or face shield, splash-resistant gown, and boot covers. Double surgical gloves are suggested for neurosurgeons to avoid cross-infection due to glove rupture. Postoperatively the OR should be disinfected after the case is completed. It is recommended that during the acute stage of the pandemic, elective surgeries should be delayed to the extent possible. A recent investigation from Wuhan, Hubei revealed that 34 cases who underwent elective surgeries during the incubation period of COVID-19 infection developed pneumonia, 44% required ICU care and the mortality rate was 20%.

Sub-acute Patients

Although these patients do not need immediate intervention, however, if not managed can have significant morbidity and mortality e.g. Low-grade glioma, arteriovenous malformation, unruptured aneurysm, Pituitary apoplexy. Management decisions require to be made on a case-by-case basis. Case prioritization should be carried out in cooperation with a senior consultant. Risks for cases should be determined by weighing the risks of proceeding versus delaying intervention. Priority should be based on both COVID-19 related and other risks, given the competing risks that many neurosurgical emergencies may come with.

Chronic Patients

Suspected or approved COVID-19 patients

should be managed with more caution and conservative management should be given priority. Non-essential elective interventions such as pituitary adenoma, (without visual deterioration) craniopharyngioma, etc., should be delayed after informing the case. For cases whose health condition is likely to deteriorate with more than 1-month delay and are keen to proceed with management can be performed on the elective list as per prioritization. It is advisable to avoid admitting patients needing elective postoperative ICU treatment. Common case follow-up may be avoided or postponed. Among all interventions, endoscopic endonasal interventions and methods like bone drilling are at the highest risk due to aerosol dispersion. Therefore, it is critical to carefully monitor the case before conducting such interventions.

2. PREVENTIVE AND THERAPEUTIC APPROACHES TO CARDIAC AND RENAL DISEASES DURING THE COVID-19 PANDEMIC

Personal Protection Equipment

Person-to-person spread of SARS-CoV2 (severe acute respiratory syndrome coronavirus 2), the virus responsible for COVID-19, is seemed to occur primarily by respiratory droplets made when the infected person coughs, sneezes, or talks. Infection can also spread if a person touches an infected place and then touches his/her eyes, nose, or mouth. The relevance of airborne transmission is currently uncertain.

1. Health care personnel providing care for suspect or approved COVID-19 patient should adhere to standard precautions and use a respirator or facemask, gown, gloves, and eye protection (goggles or face shield).
2. A respirator (N95 or higher-level respirator) should be applied instead of a facemask for electrophysiology interventions needing intubation or conscious sedation with high flow oxygen (considered aerosol generating procedures).

Follow-up of Cardiac Implantable Electronic Devices

1. We suggest a case-by-case triage of cases previously scheduled for in-clinic visit in order to find out if the consultation can be postponed while social distancing interventions are in place. This decision should be performed by an analysis of the clinical history, information from last device interrogation, and data about clinical stability investigated by telephone contact. Telephone contact should include items

to find suspected or approved COVID-19 patients.

2. We suggest postponing in-clinic follow-ups of cases with CIEDs that have been assessed within the previous year if their clinical status is stable and there are no device warnings.
3. In cases nearing battery depletion that cannot be followed remotely, the requirement for in-clinic evaluation should be carried out based on the battery estimated longevity assessed at the last follow-up and pacing-dependence.
4. In cases with recently implanted devices, we suggest postponing in-clinic assessment if their condition is stable and there were no results during the implant warranting early follow-up.
5. Cases on remote evaluation should continue to be assessed remotely. Cases with devices amenable to remote evaluating in which this function has not been initiated, should be encouraged to switch to remote assessment.
6. In cases with an implantable loop recorder (ILR) that cannot be followed remotely, we suggest postponing in-clinic

assessment if their condition is stable.

7. We suggest appropriate documentation of remote device follow-ups according to local rules.

Outpatient Arrhythmia Clinics

1. We suggest a case-by-case triage of cases previously scheduled for in-person visit in order to find if the consultation can be postponed while social distancing interventions are in place. This decision should be based on evaluation of the clinical history, findings of diagnostic investigations, and data regarding clinical stability evaluated by telephone contact. Telephone contact should include questions to find suspected or approved COVID-19 patients.
2. We suggest transitioning to virtual visit (via telephone or video) for the majority of first evaluations and/or follow-ups during the COVID-19 pandemic. This would ensure uninterrupted management of cases with arrhythmic disorders, preventing clinical decompensation, or the requirement for emergency presentations.

For centers or medical groups that have not yet adopted virtual care, early implementation is recommended.

3. We suggest appropriate documentation of virtual visits according to local rules.
4. Priority in scheduling virtual visits should be based on the patient's clinical history, findings of diagnostic investigation, and data regarding clinical stability.

Postoperative assessment of surgical wounds or vascular access sites

1. We suggest virtual postoperative assessment via telephone or videoconference for early identification of complications, according to local rules.
2. Evaluation of surgical wounds or vascular access sites can be performed through remote photographic evaluation.
3. For implantation of CIEDs, we suggest the application of absorbable suture materials to avoid the requirement for stitches removal.
4. We suggest proper documentation of re-

mote postoperative assessments according to local rules.

Noninvasive investigations

1. We suggest postponing tilt table tests while social distancing interventions are in place.
2. We suggest postponing Holter or event monitors of any duration, unless there is a high suspicion index for arrhythmic syncope. This suggestion is based on the potential risk of exposure for cases and healthcare workers during placement and removal of a device that has been in contact with the case for ≥ 24 h. Monitors can also be shipped by mail to the cases, who set up the device themselves, but this option is not available in most clinics.
3. In recent years, smartphones and wearable devices have incorporated technology capable of evaluating heart rhythm (e.g., Kardia and Apple SmartWatch). These devices can produce single-lead ECG reports that can be exported into a PDF and emailed to the physician's office. When this technology is available, its use should be encouraged, according to local

rules.

3. PREVENTIVE AND THERAPEUTIC APPROACHES TO INTERNAL AND DERMATOLOGICAL DISEASES DURING THE COVID-19 PANDEMIC

Recommendations for Infection Control in Dermatology Clinics

Disinfection

Corona virus are RNA virus enveloped in lipid bilayer and has least resistance to germicidal effects of disinfectants as compared to bacterial species, mycobacteria, non-lipid or small

viruses, fungi and vegetative bacteria in the reducing order of resistance Disinfection of laser machines should be performed using sodium hypochlorite 1% or 70% ethyl alcohol solution before initiating and post intervention. Lens, optics, cooling tips and touch screen should be disinfected with 70% ethyl alcohol before and after each treatment visit.

The virucidal efficacy of chemical germicides against coronavirus has been assessed. An investigation of disinfectants against human coronavirus 229E showed several disinfectants were effective after a 1-minute contact time; these included sodium hypochlorite (at a free chlorine concentration of 1,000 ppm and 5,000 ppm), 70% ethyl alcohol, and povidone-iodine (1% iodine). An investigation also revealed complete inactivation of the SARS coronavirus by

70% ethanol and povidoneiodine with an exposure time of 1 minute and 2.5% glutaraldehyde with an exposure time of 5 minute. Although Glutaraldehyde (GA) is an effective disinfectant but it potential to make severe allergic dermatitis and should be applied cautiously. Investigations have revealed that SARS corona virus can survive on plastered walls, stainless steel surfaces, plastics and even glass slides from one to three days. It is stable in feces and urine for at least 1-2 days. Therefore, all the surfaces should be disinfected as they can act as potential source of infection before commencing and after finishing the interventions.

General precautions which can be taken

• Waiting time before interventions can be limited by providing pre-intervention instructions through telecommunication e.g. to trim/ shave the area for laser hair decrease, use topical anesthesia 45 min before intervention which can be carried out easily at home if given appropriate regulations.

• Maximum 1-2 cases in the waiting region to be allowed with strict social distancing (gap of 6 feet), air-conditioning should be avoided in waiting regions with appropriate cross ventilation and exhaust fan.

• At the main entrance of the clinic, sanitizer kiosk should be set up with staff wearing complete PPE (N-95 mask, gloves, coveralls). • Before case enters the clinic, prescreening should be performed with infrared thermometer and pulse oximetry; questionnaire for any manifest-

ations of cold/cough/fever, including history of travel for last 2 weeks. • Appointments should be given more widely apart than common to assure time for disinfection of table top, chair, door handle, pad, paper and any other instrument like dermoscope which comes in contact with case's skin. • The case should be clarified about the interventions being taken in the clinic to prevent the transmission of the infection and only if case is ready to comply by the same including wearing mask and/or gloves. • The cases should be recommended to come alone or with only one attendant and to carry minimum things which can be kept in a bag. • The cases can send all old reports via e-communication to clinic and similarly, digital prescriptions can be given in place of hard copies to reduce the chances of transmission. • Disinfect the surfaces of contact

with cases after each case. 13 • The cases can be requested to sign a coronavirus self-declaration form stating their travel history, any manifestations of fever/cold/cough/shortness of breath etc. • The consent form for intervention should include a statement about disinfection interventions being conducted during Covid-19 and should be duly signed by the cases before start of any intervention. • Fumigation should be performed in the region of interventions and Outpatient regions daily by the end of the day.

Minimally Invasive Interventions

This category includes interventions like lead to breach in the skin or mucosa thereby increasing the chances of spread of virus through aerosolization as well via contact transmission. Therefore, the level of protection should be enhanced. Using a coverall, eye cover, gloves and N-95 mask should be the minimum level of protection before carrying out the interventions.

Invasive Interventions

These interventions should be avoided till more recommendations from local or central governing bodies are laid down. If performed, they should be conducted with extreme caution and maximum level of protection and preferably with an appropriate ventilation system and smoke evacuators.

There are two methods for protection of exposed personnel; i.e. use of ventilation methods and respiratory protection by use of mask.

4. PREVENTIVE AND THERAPEUTIC APPROACHES TO OPHTHALMOLOGICAL DISEASES DURING THE COVID-19 PANDEMIC

Recommendations for Healthcare and Nonhealthcare Providers

• For the safety of people, it is critical that any infection risk among workers be diagnosed early. This needs daily health self-evaluation before heading to the workplace. Monitoring tests (PCR and serological tests) should be scheduled at intervals set by occupational health experts. • Administrative staff in contact with cases must use a surgical mask and gloves. In reception re-

gions and counters, protective screens preferably or the use of face shields is suggested. • Healthcare staff should use their normal work clothes, a disposable gown, gloves, mask and face shield or protective goggles, the evaluation conditions permitting. FFP2 or FFP3 masks should be applied on suspect COVID-19 patients or when the evaluation planned carries a risk of producing aerosols, or needs close proximity and/or contact with the eye. • Hand washing should be a priority before and following any activity with the case. This can be performed in the same way with a hydroalcoholic gel when using gloves. Posters with washing recommendations in offices and waiting rooms are effective. • Eye drops should be instilled with gloves avoiding contact with the ocular surface or adnexa. If available, the application of single-

dose eye drops is suggested. • Safety precautions should be extreme when placing or removing eye patches and dressings. • When evaluating the tear ducts or removing silicone tubes from the nostrils, FFP2/FFP3 masks and goggles or face shields should be worn. • The application of mobile phones should be restricted as much as possible during a visit to avoid contamination and virus transmission in this way.

Care of Patients Testing Positive for SARSCoV-2

These suggestions are only used to urgent surgical procedures. Any planned intervention will be postponed until the COVID-19 situation has improved and the case has completed a two week period of home isolation after returning a nega-

tive PCR report. Any procedure should be postponed ideally until the PCR report is negative. The case should always be evaluated in terms of life risk/eye benefit. If surgery cannot be postponed, the mortality risk must be assessed, especially in hypertensive cases over 65 years of age with obesity, chronic obstructive pulmonary disease, cardiovascular disease, ARDS, immunosuppression, severe lymphopenia, or before very complex procedures. In these scenarios, various investigations have shown high ICU (Intensive Care Units) admission rates and mortality.

Transplant Regulations

Ocular tissue transplants should be noted in terms of case and clinician safety using the protection measures reported in this book. To ac-

cept donor tissue, the guidelines issued by the National Transplant Organization (ONT 2020), reference BV-ES-20200122-5, of March 13, point 2 on 'Tissue Donation' require to be followed: Regarding donation of tissues, at the current time, any approved patients with COVID-19 should be discarded. In all other patients, and provided that a negative report is not available within a day before donation, it is suggested that tissue establishments monitor for SARS-CoV-2. To enable monitoring in tissue establishments, the same samples as would be received for monitoring organ donors should be received and sent to the sample - if possible, upper airway sample. The positive or inconclusive report rules out tissue donation.

Protection and security measures

Until exact diagnostic evaluations, an effective management and/or an approved vaccine are available, establishing and complying with rigorous protective interventions in outpatient and inpatient medical centers is key both for healthcare personnel and cases. These interventions include social distancing in waiting rooms and reducing the number of appointments to and time spent in health centers; providing the essential PPE to physicians and face masks to cases; following disinfection recommendations suggested by preventive medicine services; and periodic diagnostic evaluations on healthcare personnel to optimize the distribution of tasks within the organization. We should emphasize that in the following months, depending on the control and prevalence of COVID-19, these interventions could be deferred.

5. PREVENTIVE AND THERAPEUTIC APPROACHES TO ORAL DISEASES DURING THE COVID-19 PANDEMIC

Preventive Measures Against COVID-19 in Dental Practice

Essentially, the authors agree that it is crucial to conduct an accurate telephone assessment, a subsequent assessment in dental clinics, and a complementary questionnaire to receive as much data as possible about the case and his or her family members, specifically about manifestations and movements in the previous two weeks. Temperature assessment is suggested

when the case enters the dental clinic; if the body temperature exceeds 37.3 °C, it is recommended the treatment be delayed. In cases with a cured COVID-19 infection, the American Dental Association (ADA) recommendations suggest to reschedule dental treatment at least three days after the resolution of the manifestations, or a week after the appearance of initial manifestations, such as fever controlled without antipyretics and spontaneous improvement of breathing. Meng et al., in a precautionary way, set the essential recovery period to one month before conducting non-deferrable dental care in cases who have been infected. For medical-legal issues, a patient's self-certification is also needed with respect to what he/she claims during the telephone and clinical triage stage.

The ADA and the Centers for Disease Prevention

and Control (CDC) suggest keeping the waiting room empty, without journals, and avoiding the overlap of two or more visits. If this is not possible, the minimum distance between one case and the other must be 2 m (6 feet) in each direction.

In extreme conditions, for health protection, it is reasonable to ask cases to wait in their vehicle, if possible, or nearby to the dental clinic, and advise them by telephone call or message when it is their turn.

As far as pediatric dentistry is concerned, cases accompanying minor age cases are requested to come to the appointment in the smallest possible number, wear a protective mask, wait in the waiting room, and not attend the patient's treatment to avoid the risk of aerosol receive.

More accurate investigations have been performed to approve the importance of oral rinses just before dental management; Costa et al., in an investigation in 2019, showed how the application of chlorhexidine at 0.12% and 0.20% changes the amount of bacteria, viruses, and fungi present in the oral biofilm, decreasing the risk of cross-contamination due to aerosol. Since COVID-19 is sensitive to oxidation, Peng et al. suggested rinsing with 1% hydrogen peroxide or, alternatively, with 0.2% povidone-iodine. This must be considered with caution: saliva is constantly and cyclically reproduced by the salivary glands, making the virus available again.

Regardless of the type of management planned, healthcare providers, especially dentists, hygienists, and dental assistants, must follow rigid protocols related to dressing and personal pro-

tective equipment. Hair caps, protective goggles, surgical masks or N95, disposable surgical gowns, special footwears, and protective visors are necessary. According to the "EN ISO 374-5.2016" rule, for medical protection gloves to be known functional against microorganisms, such as bacteria and fungi, must pass the penetration test, which analyzes air and water transition through material pores, seams, holes, and other structural imperfections. "ISO 16604: 2004 method B" is an additional evaluation that is essential to show the specific protection of the gloves against viruses.

The PPE should be applied as asserted in the instructions in the user manual and must be disposed of as special waste. It is always suggested to check the integrity of the PPE, and if any negative results, remove the PPE rapidly.

Pragmatic and Technical Recommendations during Dental Treatment in the COVID-19 Era

Hand hygiene is knowns as the first step in limiting the spread of the virus; WHO recommendations impose scrupulous hand-washing before and after any contact with the cases. Being previously considered a necessary tool for proper operating practice, the rubber dam has become even more so after the viral epidemic of 2020. Different researchers underline the utility of the rubber dam on containment and protection from oral fluids; it decreases the particles present in the aerosol by 70% and also drastically decreases the risk of cross-infection. If it is not possible to position it, Peng et al. suggest the

application of the Carisolv and an excavator for conservative cares.

High-speed rotating tools, such as the turbine and the contra-angle, must be equipped with an anti-retraction system, which prevents the release of debris and fluids that can accidentally be inhaled by healthcare providers during clinical interventions. Meng et al. recommends reducing the application of these instruments; if this is not possible, the last appointment of the day should be intended for those cases who require dental cares needing the application of high-speed rotating tools. They also suggest not to use intraoral radiographs; therefore, they suggest the application of orthopantomography or CT if strictly essential. The researchers agreed on the requirement for four-handed work to decrease the risk of spreading the virus in the dental care

clinics, to manipulate the water-air syringe with extreme caution, and to apply large-volume aspirators. Concerning potentially deferred dental emergencies, Luzzi et al. suggest remote telephone or assistance support from the dentist. In the case of pulp pain, treatment with non-steroidal anti-inflammatory agents, such as ibuprofen, and antibiotics, such as beta-lactams, are suggested, if the case does not have sensitivity.

Alharbi et al. classified therapeutic dental interventions into five subgroups: emergencies, emergencies manageable through invasive or non-invasive interventions (minimum aerosol), non-emergencies, and elective managements, depending on the dentist. Among the emergencies, the authors show maxillofacial fractures that compromise the respiratory tract, uncontrolled post-operative bleeding, and bacterial

oral soft tissues infections with intra- or extra-oral swelling that negatively affect the patient's respiratory ability.

Orthodontists are recommended to stop activating the fast palate expander; parents are instructed to reposition the Ni-Ti arch if it should go off-axis and cause a contact ulcer on the oral mucosa. Any non-urgent management must be delayed; if this is not possible, the dentist must follow strict guidelines to avoid contagions. Peng et al., advise the removal of waste using special yellow double-layer bags for special waste and mark them to facilitate their removal.

6. PREVENTIVE AND THERAPEUTIC APPROACHES TO SURGICAL CARES DURING THE COVID-19 PANDEMIC

Cleaning

Understanding the structure of SARS-CoV-2 assists to better understand how to eradicate it from the environment. It is well-known that viruses are small, obligate, intracellular particles, and must infect and take over a host cell to replicate. They consist of a viral genome of DNA or RNA (SARS-CoV-2 contains a single strand of RNA) and a protein coat (capsid) made up of protein molecules knowns capsomeres. The

capsid with its enclosed viral genome is considered as the nucleocapsid. The nucleocapsids of different viruses are surrounded by a flexible membrane which is an envelope. In SARS-CoV-2 the envelope is related to three structural proteins: spike (S) protein, envelope (E) protein and membrane (M) protein. The S protein is instrumental to achieving entry to the host cell through binding to the human angiotensin converting enzyme 2 (ACE2) receptor.

The envelope means that SARS-CoV-2 is relatively easy to eliminate through cleaning. Soaps and detergents are chemical proteins acting as surfactants – they emulsify the virus and decrease the surface tension, so it can be easily washed away. Alcohols denature proteins and dissolve lipids, causing disintegration of the envelope. This means that the virus cannot then

enter cells, which is essential for replication. For viruses such as norovirus and rhinovirus which do not have an envelope, this is not the case, meaning alcohol is not a reliable means of inactivating these viruses.

Hand hygiene

Hand hygiene is a cornerstone of IPC, but compliance with hand hygiene is commonly lower than recommended aims. Good hand hygiene with alcohol-based hand rub or soap and water has been revealed to remove microorganisms picked up from a case, and is vitally critical and a simple measure to assist prevent hospital-acquired infections (HAIs) and spread of antimicrobial resistance.

The WHO ‘five moments for hand hygiene’ rec-

ommends the key moments when HCW hands may become contaminated and hand hygiene should be carried out.

- • before touching a case
- • before clean/aseptic interventions
- • after body fluid exposure/risk
- • after touching a case
- • after touching patients' surroundings.

Handwashing for a minimum of 20 seconds has been an important part of IPC practice throughout the pandemic. It has gained a significant amount of attention and been widely promoted as part of the hands-face-space-fresh air campaign. This focus requires to continue even after COVID-19 prevalence falls, to ensure HCWs' hands are not a vector for transmitting other clinically important microorganisms.

Environmental Cleaning

Unlike spore-forming organisms such as Clostridioides difficile where ultraviolet light or hydrogen peroxide vapour are needed to decontaminate healthcare environments, enveloped viruses like SARS-CoV-2 can be eliminated from surfaces with a thorough clean. A combined detergent/disinfectant solution at a dilution of 1000 parts per million available chlorine (ppm av.cl) or a general-purpose neutral detergent in a solution of warm water followed by a disinfectant solution of 1000 ppm av. cl. is recommended. What is significant is the enhanced frequency of cleaning especially of common touch points such as door handles which are typically re-contaminated after a couple of hours.

PHE COVID-19 IPC guidance recommends to enhance cleaning of both the environment and equipment in care areas to at least twice daily – this includes commonly touched points and communal facilities such as shared toilets. One could hypothesize that enhanced cleaning would also decrease other microorganisms in the patient's environment. There are several investigations that propose cleaning is an essential measure in the decrease of transmission of MRSA, vancomycin resistant enterococci (VRE) and multidrug-resistant (MDR) Gram-negative organisms including carbapenemase-producing Enterobacterales (CPE). One investigation showed enforced cleaning was correlated not only with less surface contamination with VRE, but also a significant decrease in VRE cross-transmission between cases. Another study

shows an MRSA outbreak among male cases on a surgical ward; it was only when time allocated for basic cleaning of the ward was doubled with emphasis on vacuum cleaning and common cleaning of shared medical equipment that the outbreak resolved. Prior to the enhancement in cleaning, cases had received the MRSA outbreak strain and it was shown to be widespread in the environment. After the cleaning measure, the outbreak strain was eradicated from the ward environment and there were no more infections with this strain. A prospective single center cohort investigation which looked at MDR Gram-negative bacteria acquisition on an intensive care department, showed admission to a room previously occupied by a case colonized with a MDR Pseudomonas aeruginosa or Acinetobacter baumanii was an independent risk factor

for receiving these organisms. The PHE Framework of action to contain CPE stipulates the significance of effective cleaning to reduce the risk of transmission of MDR organisms. This is alongside other interventions, including antimicrobial stewardship measures to decrease the application of broad-spectrum antibiotics (essential in preventing antimicrobial resistance) and conducting a CPE risk evaluation and monitoring and isolating high risk cases – affirming the significance of taking a travel history especially any contact with healthcare.

These investigations shown the significance not only of standard infection control interventions such as PPE and hand hygiene, but also how the environment can play a huge role in cross transmission of these microorganisms; and decreasing the bioburden by common and thorough

cleaning may also reduce the incidence of HAI.

WHO IPC guidance recommends a terminal clean of the operating room after a known COVID-19 case or if the patient's condition is unknown (i.e. for cases on the medium and high risk pathways). A terminal clean involves the thorough cleaning and disinfection of all surfaces and re-useable instrument.

Personal Protective Equipment (PPE)

The Health and Safety Executive PPE at work regulations 1992 recommends; 'PPE is the equipment that will protect the user against health or safety risks at work'. It is one part of the standard infection control precautions (SICP). SICPs are the basic IPC interventions essential to decrease the risk of transmission of infectious

agents from both recognized and unrecognized sources of infection. The SICP PPE instrument depends on the risk of exposure to blood and/or other bodily fluids and includes gloves, apron or gown, mask and eye protection. In addition to SICPs are transmission-based precautions (TBPs) which are worn when a case is suspected or known to have an infection. The TBPs are related to the route of transmission of the suspected or known pathogen and include contact, droplet and airborne precautions.

National IPC guidance for COVID-19 suggests that HCWs caring for cases with and without proven COVID-19 should use fluid-resistant surgical masks IIR (FRSMs) as respiratory protective equipment (RPE), unless aerosol-generating procedures (AGPs) are being performed, when a filtering face piece 3 (FFP3) respirator should be

applied. The most recent update in June 2021 adds that the FFP3 respirator is suggested if 'an unacceptable risk of transmission remains following rigorous use of the hierarchy of control'. The national guidance does not directly state what PPE should be used for surgery but this is implied to be in keeping with general guidance for the low-, medium- and high-risk pathways. Cases on the medium- and high-risk pathways should be anaesthetized and recovered in theatre, and with intubation and extubation being listed as AGPs FFP3 should be used.

A number of organizations in England have formed their own guidance and are providing airborne precautions to all HCWs treating for COVID-19 positive cases irrespective of whether AGPs are being conducted. Cambridge University Hospitals NHS Foundation Trust collated in-

formation from their HCW testing program and during the first and second wave of the pandemic showed a higher incidence of infection amongst HCWs treating cases with COVID-19, compared to those who did not, and this did not associate with community prevalence. They instigated a change in respiratory protective equipment from FRSM to FFP3 respirator for all staff on COVID-19 wards and evaluated the effect on staff infection rates. Following the change there were similar rates of infection on both COVID-19 and non-COVID-19 units, with no statistically significant difference between the two, showing that FFP3 respirators do protect HCWs from receiving COVID-19 at work.

PPE shortages have been widespread, especially in the early months of the pandemic; the PPE received through the NHS supply chain has not

been consistent with varying types of masks received. This proposes challenges with FFP3 masks where HCWs have been fit assessed to a particular one. Some FFP3 masks have valves, although protective to the user, the HCWs' unfiltered exhaled breath may be directed towards the case. This proposes a potential risk if the HCW is infectious but asymptomatic, although this risk is mitigated to some extent through regular evaluation and vaccination. Frequently reported concerns raised by surgeons include condensation building up on the valve and the risk of contaminating the sterile area during surgery and increasing the risk of infection. Therefore, non-valved FFP3 masks are suggested during theatre and for sterile interventions.

7. PREVENTIVE AND THERAPEUTIC APPROACHES TO ENT DISEASES DURING THE COVID-19 PANDEMIC

Patients' Screening

Detection of infected or suspicious cases is the first part that will help both medical personnel and cases to quickly enter standard COVID-19 infection prevent and control management measures and avoid unnecessary risks of nosocomial transmission. Otolaryngologists should pay attention to manifestations. Although frequent discomforts in COVID-19 cases are fever, cough, shortness of breath and sometimes re-

lated to sputum, fatigue, myalgia, some cases also have regular ENT complaints such as sore throat (13.9–60%), rhinorrhea (4–6%) and nasal obstruction (4.8%), 2.1% has tonsil swelling and 1.7% has throat congestion. In other regions, such as Brazil, the USA and Europe, COVID-19 has also been correlated with other changes such as anosmia and dysgeusia. These manifestations in an isolated form also constitute criteria for quarantine. Abdominal pain and skin rash have also been stated, and can be confusing manifestations in regions where dengue, chikungunya and measles are already epidemic. Epidemiological contact history in about one week is another key to evaluate a suspicious infection. Early in China's experience, 72.3% of cases had had contact with subjects in the original city, Wuhan, and 31.3% had revealed travel

history. However, with rapid global widespread and infection increase in communities, not only travel history but also any contact or staying in an enclosed environment with cases who have been approved or suspected with respiratory illness in the previous two weeks should be considered. In China, many cases have been infected while treating for sick family members, thus infections transmission in families cannot be ignored.

Examination Suggestion

Asymptomatic transmission is a significant feature of COVID-19, there is 1.8% potential infectivity among subjects with negative manifestations monitoring finding. Therefore, for suspected cases without typical manifestations,

necessary evaluations should be carried out to exclude potential infection. Chest X-radiography or CT is suggested firstly, and pulmonary ground-glass opacity (GGO) and bilateral infiltration manifestation commonly suggest SARS-CoV-2 related infection. Blood test will provide more support for diagnosis, approved cases often have lymphopenia and increased CRP level, or leukopenia or thrombocytopenia. SARS-CoV-2 real-time reverse transcriptase–polymerase chain reaction (RT-PCR) exam is the clinical diagnostic criteria. Recently, antibody test was used and increased IgM after 5 days of manifestation showed early infection. But the clinical application of the latter two depends on the detection capability of local healthcare system.

Medical Service Management

Given the severity of virus transmission and the fast growth in the number of infected cases, healthcare services should be adjusted accordingly to decrease the accumulation of cases in hospitals, decrease the risk of nosocomial transmission to personnel and other cases, and ensure enough medical services and supplies to respond outbreaks of respiratory infective disease. In the Chinese reports, during the early outbreak, ENT clinic, common endoscopy and surgeries were postponed, only emergency cases were carried out and surgeries were conducted until the epidemic was well controlled. Elderly medical personnel or with co-morbidities such as cardiovascular disease, hypertension, diabetes and cancer, who are susceptible to more

severe infection and worse prognosis, were proposed to avoid engaging with high infection risk medical interventions.

We also propose the restriction in the essential number of personnel during interventions and segregate into smaller groups or subjects to cover entire services, with the aim to keep as many doctors and residents home each day as possible, to reduce the possibility of transmission between providers if someone gets exposed or infected.

In the author's (C.Z) hospital, telemedicine has been used during pandemic. Cases can make visits through a mobile app and have text consultation with physicians. After an initial assessment, the physician can decide if an in presence visit is required and permitted to consultation in hospital. Meanwhile, most postoperative cases

can get remote recovery recommendations. The service is currently free during the outbreak.

Treatment

Regarding treatment, there is still no concrete data. There are studies about the application of hydroxychloroquine and azithromycin in severe patients, for rescue, in the hospital environment. However, there are reports of indiscriminate application of hydroxychloroquine by the people, without any form of risk control. Results of cardiovascular toxic symptoms (hypotension, suppression of myocardial function, cardiac arrhythmias and cardiac arrest) have been recorded among these cases in indiscriminate application. Hydroxychloroquine is applied to manage rheumatoid arthritis, systemic lupus

erythematosus, malaria, among other diseases. The application of topical and systemic corticosteroids has been contraindicated. Application of vasoconstrictors to control nasal manifestations and nasal lavage with small volumes to avoid swallowing. Antipyretics, oxygen supplementation and, in cases with severe dyspnea, application of respiratory ventilators.

8. PREVENTIVE AND THERAPEUTIC APPROACHES TO PSYCHIATRIC DISEASES DURING THE COVID-19 PANDEMIC

Preventive Interventions

Since December 2019, the outbreak of a respiratory epidemic arising from a novel coronavirus extended rapidly from ground zero at the city of Wuhan, Hubei Province. As of 00:00 on March 6, 2020, about 98,332 cases have been infected across the world, the figure that has already far exceeded the numbers for SARS in 2003 and MERS in 2012. Furthermore, other than a certain degree of progress in the control and pre-

vention of the epidemic in China, the conditions in other countries have deteriorated. Without appropriate protective interventions, COVID-19 may be transmitted through airborne droplets from coughing and sneezing, as well as close contact. Moreover, air transmission and feces-mouth transmission have not yet been approved, though there are signs that such transmission means are probable.

As people receive more information about the disease, the prognosis for the majority of cases infected by COVID-19 has been relatively promising, but the prognosis for a small number of cases in critical conditions, especially seniors and cases with chronic diseases, are less optimal. The enclosed caring model employed at most psychiatric medical centers represents a daunting challenge for effective control of infectious

disease and thwarting outbreaks within institutions. The Fourth People's Hospital of Chengdu is the ninth most important hospital in terms of scientific investigation and one of the largest psychiatric medical care centers in southwest China. We suggest the following recommendations and approaches for psychiatric medical centers during the ongoing COVID-19 epidemic.

At present, COVID-19 manifestations mainly include fever, dry cough, and fatigue, but some infected cases may not reveal any manifestations. Hence, preliminary monitoring, pre-evaluation and triage, and fever clinic treatment at psychiatric medical centers are particularly critical.

Medical care personnel should earnestly report patient data such as name, gender, age, job, home address details and phone number. In case of possible violent behaviors exhibited by

psychiatric cases, security staff should be garrisoned at clinic zones to maintain order. All personnel at the medical center should be equipped with the proper protective equipment. Signs should be posted to remind cases to protect their respiratory system and common wash hands.

During the epidemic period, cases who match critical psychiatric illness standards and who are known as potential carriers of COVID-19 shall be kept within the infection quarantine ward to receive care according to potential virus carrier guideline. For cases who match critical psychiatric illness guidelines but are not known as potential carriers of COVID-19, they should be kept within the psychiatric transition and observation unit for two weeks, as per medical center and emergency room guideline, before being transferred to a common unit when rele-

vant conditions are met.

General units should regard “defense against the import of infection, prevention of internal outbreak" as the principle. First, personnel should notify patients’ relatives individually, via channels such as phone calls or WeChat, to refuse relatives from visiting a medical center or bringing over food and other items during the ongoing epidemic except for special conditions. If they want to know the condition of the case, they can contact the ward by phone. Second, the specific section "food and item temporary storage" should be set up outside units, and signs to inform visitors info, such as a phone number, should be opened. Patients’ relatives who bring food and other items should contact the unit and wait at the visiting part outside the unit. Nurses should inspect food and items and

sanitize the exterior packaging (spraying with alcohol or disinfectant) at temporary storage. During the consultation or visit, nurses should try to avoid direct contact with patients' relatives. Third, physicians should send a suggestion to patients' relatives to inform them of cancellation of leaving or visiting requests such as Chinese New Year and other holiday seasons, and to recommend communication by phone call or video chat. Fourth, all units should track movement of all personnel (including physicians, nurses, assistant attendants, and janitors) and evaluate the risk of infection daily. Moreover, the unit should arrange personnel with infection risk to quarantine at home or quarantine at work. Fifth, based on recommendations from physicians of traditional Chinese medicine (TCM), it is suggestive to administer TCM herbal

fumigation around the clock and prepare TCM preparation for all personnel to increase immunity.

Taken together, personnel in psychiatric medical centers are burdened with a challenging administrative mission during this special period. We must follow the principle "defense against the import, prevention of internal outbreak", the health and interest of psychiatric cases and their relatives should be safeguarded to the maximal extent. Hence, in terms of infection prevention and control at psychiatric medical centers, the actual condition of the epidemic should be taken into full account. First, implementation of infection prevention and control must be assessed at the clinics, emergency rooms and units where personnel may come into direct contact with a case. Second, it is also essential to pay attention

to infection prevention and control at supplementary divisions and units that are involved in any step of the process. Third, psychiatric medical centers should help the community in the management, treatment, and care of subjects with severe mental diseases at home.

Considerations for Interventions in Behavioral Health

In response to the COVID pandemic, this procedural unit should follows the perioperative services recommendations so that cases are monitored for COVID 24–72 h before every treatment. In order to accommodate 6-foot distancing, the pre- and post-interventional unit of ECT decreased its occupancy. This caused treatment days adjusting from 3 times a week to 5 times a

week. All personnel use level 3 masks with face shield in the pre- and post-interventional unit and an N95 with face shield in the treatment room as ECT is deemed an aerosolizing intervention. A 21-min down time between cases was implemented to allow for full air turnover of the treatment room.

The transcranial magnetic stimulation (TMS) treatment room was downsized to a single case treatment room to accommodate 6-foot distancing recommendations. Personnel wear level 3 droplet masks and face shields.

If a case is reported to be COVID positive following treatment in the ECT or TMS suite, the room is terminally disinfected and undergoes ultraviolet light disinfection. There would be no case or personnel exposures while following the suggested recommendations.

Special Challenges for Inpatient Psychiatric Settings

Open-space departments for the treatment of inpatient psychiatric cases present special challenges for infection prevention. It can be challenging to isolate cases requiring close contact for treatment. On inpatient psychiatric medical centers, cases usually participate in group treatments and group meals. Cases are allowed (and, prior to the COVID-19 pandemic, encouraged) to walk in hallways with increased verbal interactions. Milieu treatment is an integral part of inpatient psychiatric management involving close contact with cases and personnel. This can prove difficult, as these must be effectively minimized or cancelled in order to control the trans-

mission of COVID-19.

Infrastructure Differences Between Psychiatric Units and Medical/ Surgical Units

In many parts of the country, there is a scarcity of psychiatric inpatient beds. As such, it is necessary for these units to remain operational and safe during this pandemic in order to meet the requirements of the cases these inpatient units serve.

Inpatient psychiatric wards differ from medical and surgical wards in several ways. Even within inpatient psychiatric wards, there are differences in terms of infrastructure. Some inpatient psychiatric wards are part of free-stand-

ing psychiatric medical centers with their own emergency units. As a result, such wards may not readily have access to specialty medical care if someone contracts COVID-19. Outbreaks in a free-standing facility have the potential to make a partial or even complete shutdown of the facility. Other inpatient psychiatry wards may be co-located with medical and surgical as well as intensive care units and may be better equipped to deal with an increase in the number of patients. Psychiatric wards are oftentimes locked wards and there are some benefits and disadvantages related to this fact. When considering controlling the spread of COVID-19, one benefit of having a locked ward is that cases cannot walk out of the ward and inadvertently contribute to the spread of the infection. On the other hand, the cases and personnel may feel cut off from

the rest of the building and be at risk of adverse effects of isolation.

9. PREVENTIVE AND THERAPEUTIC APPROACHES TO PEDIATRIC DISEASES DURING THE COVID-19 PANDEMIC

COVID-19 Vaccinations in Children

Several COVID-19 vaccines have been confirmed for application in children and/or adolescents in at least one country, including Comirnaty (Pfizer), Spikevax (Moderna) and CoronaVac (Sinovac Biotech). In Australia, Comirnaty's registration was recently extended to include patients aged 12–15 years, following findings of an ongoing phase III trial in 2260 patients. The trial showed vaccine efficacy against symp-

tomatic COVID-19 from 7 days after the second dose of 100% (95% CI 78.1–100). It has been shown that neutralizing antibody titers were higher in 12–15 year olds than in 16–25 year olds. Mild-to-moderate local and systemic adverse events were frequent, including injection site pain (80%), fatigue and headache (60%) and fever (20%). The safety and efficacy of Moderna's Spikevax has also been shown in cases aged 12–17 years (n = 3700), and approval in Australia for this age group appears likely. Trials of both vaccines in children aged ≥6 months are planned or underway. Early safety and efficacy results for the inactivated SARS-CoV-2 vaccine, CoronaVac, are promising for children as young as 3 years.

Safety results in adolescents are mostly limited to clinical trials, which are under-powered to find rare adverse events. Both Comirnaty and

Spikevax are correlated with a rare risk of myocarditis (2.7 per 100 000 persons), occurring more commonly in adolescents and young adults compared to subjects over 30 years. Whilst concerning, the vaccine-related cardiac events affecting predominantly young males after the second dose are short lived and occur with a 3.7-fold lower rate than if caused by an acute SARS-CoV-2 infection itself. The pediatric trial of AstraZeneca's COVID-19 vaccine was halted following the detection of thrombosis with thrombocytopenia syndrome, a rare but important adverse event which disproportionately affects younger adults (3.4 per 100 000 in persons aged <50 years).

Severe illness from acute COVID-19 is rare in healthy children; therefore, the direct advantage of vaccination to the individual child may

be lower relative to other age groups. In fact, preliminary modelling recommends that population-wide health outcomes of SARS-CoV-2 will not be considerably affected by inclusion of 12–15 year olds in the broader vaccine roll-out programs. There are also broader ethical issues at play, with the WHO urging wealthy regions to consider donating vaccine doses intended for children to COVAX, where they could be distributed to subjects in low and middle income regions.

With recent Therapeutic Goods Administration (TGA) and Australian Technical Advisory Group on Immunisation (ATAGI) advice, vaccination of children from 12 years of age is now suggested in Australia, and both Comirnaty and Spikevax have received TGA confirmation for this age group. The decision to expand vaccine

application to younger children will be determined following evaluation of safety from overseas vaccination programs, noting the indirect advantages of vaccinating younger children in decreasing transmission to other age groups, and vaccine availability. Recent phase 2/3 information approving high efficacy and safety for Comirnaty (given at a lower 10 microg dose) in 5- to 11-year-old children will inform these TGA suggestions.

Alongside the roll-out of vaccination programs for adolescents and children, high vaccination rates in subjects working within childcare, school and health-care settings must be encouraged to give indirect protection to children, minimize transmission events and ensure necessary services for children continue undisrupted.

What Are the Preventive Measures to Use?

Current results recommends that SARS-CoV-2 spreads from person to person directly and/or indirectly (through contaminated objects or surfaces) through close contact with predominantly symptomatic (but also asymptomatic) infected subjects through secretions of the mouth and nose (saliva, respiratory secretions or droplets) and perhaps fecal matter.

The main differences that characterize pediatric age, compared to adult age, and that must be noted in relation to preventive interventions against SARS-CoV-2 are that in children and adolescents, the disease presents itself in a less severe manner than in adults, with 96%

of patients being asymptomatic or with mild-moderate manifestations and a lethality in the age group 0–15 years of 0.08%. Furthermore, children are mainly infected within households, while transmission within educational services is less common. Most school-age cases (40%) occurred in adolescents (14 and 18 years old), followed by primary school children aged 6–10 (27%), middle school children aged 11–13 (23%) and 3–5-year-old preschool children (10%) . However, the role of children and adolescents in the spread of the infection remains to be shown with precision. Younger children (preschool and primary) appear to transmit SARS-CoV-2 less often than adolescents. Transmission by adolescents can occur with the same rate as adults in family and community settings. Little is known about the spread of the infection of the new vari-

ants of SARS-CoV-2.

During the pandemic, stressful risk factors such as lack of social contact and loss of school routines have been correlated with long-term neuropsychiatric sequelae. In particular, several investigations have shown high levels of anxiety, depression and post-traumatic stress disorder in quarantined children. For these reasons, among the various measures of social isolation implemented as preventive interventions to contain the epidemic, the closure of educational services and schools is the most evaluated and noted less relevant one, in the face of an important social, behavioral and psychological fallout.

With Respect to Mental Health, Is There a Need for Support

Interventions for COVID-19-Positive Children and Adolescents?

Most children and adolescents who are positive for SARS-CoV-2, as stated, asymptomatic or paucisymptomatic. However, little is reported about the possible complications of the infection, often affecting the parents, on their overall state of mental health, also considering the needed home isolation or the rare requirement for hospitalization. In the literature, emotional and overall discomfort problems caused due to the lockdown period, the school closure and poor socialization are becoming increasingly evident also in the pediatric cases. The findings of the investigations reveal that the nature and extent of this impact depend on different vulnerability factors such as developmental age, pre-exist-

ing physical and mental health conditions, being economically disadvantaged, but also being quarantined due to infection or risk of infection.

10. PREVENTIVE AND THERAPEUTIC APPROACHES TO GYNECOLOGICAL AND UROLOGIC DISEASES DURING THE COVID-19 PANDEMIC

Patient Management

The outpatient service adopted an online visit system. Cases with visit data and their family members (only 1 person) can visit a physician. Cases and their families were requested to use masks, and correct mask using was emphasized. The entrance of the clinic was equipped with an infrared temperature identifier. The personnel at the entrance used a hand-held temperature

gun to assess the temperature of the cases who entered the clinic. If the body temperature was higher than normal, they were admitted to the fever unit. Subjects with normal body temperature could enter. Before entering the gynecological regions, the triage nurse assessed the health codes of the cases and their families. Based on the mobile big information provided by government, key cases, subjected to epidemic prevention and control, are indicated with red code. Cases at risk of potential epidemic are with yellow code. Other cases are indicated with green code. The cases with a green code could see a physician, and the cases with a red code were requested to go to designated clinics. The temperature was assessed again. Then, the triage nurse marked the normal temperature and green code symbol on the management sheet.

The cases filled out the outpatient monitoring form “outpatient 14 questions” at the triage table. Items 1–4 were epidemiological history monitoring, items 5–7 were clinical symptom monitoring, and items 8–14 were related to high risk factor monitoring. The cases were asked if they had high risk factors, fever, cough and other acute respiratory illness manifestations. The cases were needed to fill out the form and sign the notification before entering the diagnosis units. In the diagnosis room, the physician reconfirmed the temperature and questionnaire and then began the outpatient clinic activity. Gynecological cases are commonly accompanied by family members. Except for cases in emergency units, only cases were allowed to enter the waiting regions, and accompanying subjects were needed to wait outside the waiting regions.

The safety distance between staff was needed to be more than 1.5 meters, and we marked 1.5 m intervals on the floor. There are subsequent phone contacts with cases and their family after leaving the clinic at 7th and 14th day, to approve whether they have been diagnosed as positive for COVID-19. If a patient of COVID-19 is approved, the clinical personnel who has contacted the COVID-19 case, as well as the cases who have contacted the personnel during that period, will be tracked according to the reports in the hospital's computer system. These cases at potential epidemic risk will subject to viral nucleic acid evaluation and put in quarantine for two weeks.

Management of Gynecological Healthcare Workers

The temperatures of gynecological healthcare providers were assessed before work and any abnormal cases were reported immediately. It's essential to ensure complete hand hygiene, physical distancing and application of other personal protective equipment (PPE), including masks, gloves, gowns, cap, shoe cover, and goggles or face shield, to prevent dissemination of virus. Triage nurses and physicians in the gynecology outpatient unit adopted measures of no less than two-level protection. In gynecological intervention units, such as colposcopy rooms, gynecological treatment rooms, hysteroscopy rooms, family planning intervention rooms, etc., the personnel wore three-level protection, including isolation clothes, masks, gloves and shoe covers, goggles and face screens. Hand hygiene and appropriate mask using were em-

phasized to decrease the risk of SARS-CoV-2 pneumonia among healthcare providers. During lunch and rest time, healthcare providers were needed to maintain an effective distance of more than 1.5 meters. The indoor ventilation was maintained in good status, and personnel were scheduled to eat in batches to avoid large gatherings. Furthermore, triage nurses and physicians accepted viral nucleic acid and antibody tests irregularly. Once a local positive case is approved, all clinical personnel have to be monitored.

Features of Outpatient Operation

All specimens that may be known as potential risks for biological contamination, such as leucorrhea specimen test tubes, cervical cytology specimen bottles, and pathological evaluation

specimens, were placed in specimen bags for inspection. The outpatient family planning operating room was divided to provide a special area for cases in need of emergency treatment with no time for monitoring. In strict compliance with the above interventions for prevention and control and monitoring, none of the healthcare providers in the gynecological outpatient unit was infected.

Importance of Prevention and Control Measures in Gynecological Outpatient Clinics

After the outpatient temperature monitoring, medical history inquiry, health code inquiry and temperature monitoring again, the cases with manifestations were basically removed

and could not enter the gynecological outpatient unit. However, asymptomatic infection could not be completely ruled out. Asymptomatic cases are infectious, and we should try to find such cases. The hospital environment was relatively enclosed; after entering the inpatient unit, there was a high chance of spreading the epidemic. SARS-CoV-2 is highly contagious. The main routes of transmission are respiratory droplets and close contact transmission. There may also be air transmission and fecal-oral transmission. Although there is no finding demonstrating the existence of SARS-CoV-2 in the vagina, the cases and physicians shared the same space with limited air flow, and there was a possibility of infection. SARS-CoV-2 nucleic acids can be found in blood; therefore during outpatient interventions, such as family planning

surgery, hysteroscopy, and tubal fluid infusion, the healthcare providers may be contaminated by blood. Therefore, outpatient physicians have a certain risk of infection, and outpatient control is very critical.

11. PREVENTIVE AND THERAPEUTIC APPROACHES TO REHABILITATION INTERVENTIONS DURING THE COVID-19 PANDEMIC

Acute Treatment

It was important to continue to ensure all the appropriate activities and procedures to prevent major disabling complications in the acute conditions requiring early rehabilitation. Physiatrists have a significant role in the development of early mobilization programs in the intensive care unit, in acute inpatient units for stroke survivors, and, after fractures, in particular in older

cases due to their higher risk for adverse consequences. For these cases, rehabilitation consultations continued at the patient's bedside, using personal protective equipment (PPE) found as gloves and surgical masks. An exception was visits conducted on dysphagic cases for which class 2 filtering face-piece particle masks, face shields, and gloves were applied by the medical personnel, because the evaluation was carried out in proximity to the aerodigestive tract.

Inpatient Rehabilitation Settings

At the outbreak of the pandemic, the inpatient beds should be disinfected with early discharges to leave the beds to the acute units, in accordance with the guidelines of the members of the Archives of Physical Medicine and Rehabilitation

Editorial Board. As recommended by McNeary et al., a running list of cases who were almost ready for discharge and had good caregiver support was constantly updated. These cases and the caregivers were warned about the early discharge. The readiness for discharge was assessed through Functional Independence Measure and Barthel index scores. If, after the discharge, more care was required, the discharged cases continued to receive the cares at home. During the entire pandemic period, the staff working in our unit had been swabbed for COVID-19 every 20 days. Some rehabilitation residents and doctors were voluntarily reassigned to emergency activities joining multiprofessional groups, dealing mainly with triage of cases with suspicious manifestations of COVID-19 infection.

Outpatient and Home-Based Rehabilitation Services

Because of the limitations stated by the national authorities in the movement of subjects to prevent the spreading of the infection, there were great difficulties in providing diagnosis and proper rehabilitation cares in the outpatient setting. Because of the shortage of professional figures and the rapid increase in the contagion, on March 4, 2020, almost all the visits for outpatient evaluations and all the ongoing rehabilitation cares were canceled. Outpatient roles were reserved for cases with subacute neurological injuries due to severe acquired brain lesions or stroke and neurodegenerative disorders, and their daily rehabili-

tation was continued. Alternative communication pathways were implemented to delay other outpatient assessments while maintaining the therapeutic association with cases experiencing chronic diseases without risk of rapid functional deterioration. Before the pandemic, less than the 10% of follow-up assessments were performed through telephone calls and contacts by e-mail. From March, the assessments of imaging and hematochemical evaluations and the collection of feedback from cases with chronic diseases took place through telephone calls and via e-mail in place of face-toface visits. Furthermore, a specific website was developed in a short time to maintain contact with cases, providing them with videos and images of rehabilitative guidelines that could be conducted at home. Among younger cases, alternative types of communica-

tion were well received; for young cases with scoliosis, specific guidelines were available on the website and bimonthly telephone contacts were exploited as valid alternative to ambulatory follow-ups. However, technological skills were needed to successfully use these methods and older cases and those with neurological diseases could poorly exploit them. Preliminary information collected through a questionnaire at the reopening of outpatient works (from May to August 2020) in our rehabilitation department have revealed that 81% of cases preferred face-to-face consultations rather than alternative communication methods and only 9% preferred to avoid the ambulatory visit because of the risk of contagion.

12. PREVENTIVE AND THERAPEUTIC APPROACHES TO RADIOLOGICAL INTERVENTIONS DURING THE COVID-19 PANDEMIC

What the Radiologist Should Know About SARS-CoV-2 Virus

The SARS-CoV-2 virus was shown to be a ß genus coronavirus (one of the four genera of coronavirus), with a structure and a genome very similar to other known coronaviruses, such as SARS-CoV and MERS-CoV. It is a virus with a single capsid-enveloped RNA chain of different morphology (normally rounded and ovoid) with a size of between 60 and 140 nm. The

nucleocapsid is protected by a phospholipid envelope into which the surface glycoproteins are inserted (S, HE, M and E). Of the these, the S protein is especially relevant, as it binds to the cell receptor to allow the virus to enter the cell. The S protein is divided functionally into two parts: S1 (responsible for binding with the cell receptor) and S2 (which allows fusion with the cell membrane).

Covid-19: Transmission and Prevention

The main form of transmission of the SARS-CoV-2 virus from one human being to another is by the secretions of infected cases, mainly through direct contact with respiratory droplets of more than 5 microns (and which can be

transmitted at distances of up to 2 meters). Contact between the hands or contaminated fomites with the mucosa of the mouth, nose or eyes can constitute an a pathway of infection. The virus has also been identified in the saliva of infected cases, which opens up the door to diagnosis by saliva samples. The virus is known to can persist for up to 9 days on certain surfaces (metal, plastic or glass), although it can be neutralised by means of the common disinfection agents. The virus has been isolated in smaller droplets, and while the possibility of airborne transmission is still being debated, some subjects of this type of transmission have been approved in closed and poorly-ventilated environments. For these causes, and while not all suggestions include measures for preventing airborne transmission, it is critical to maintain good hygiene

and suitable ventilation of all rooms. The frequency of bowel involvement means that fecal transmission is less common. One recent review reveals that this has yet to be explained, and that although there is no evidence of transmission, strict hygiene measures must be performed to prevent it. Vertical (mother-to-child) transmission is thought somewhat unlikely, although some isolated patients have been reported. The presence of the virus in the semen of a small group of cases has been approved, albeit only in the initial days of convalescence. Nevertheless, sexual transmission is thought somewhat less common.

Prevention (Basic Interventions)

• Establishing barriers (distance or physical

barriers) between cases. The basic measures would be the safety distance (2 meters) and the wearing face masks. When dealing with infected or possibly infected cases, the application of personal protective equipment (PPE). • Hygiene. Hand sanitisation is the simplest and most effective intervention for preventing the transmission of microorganisms, including SARS-CoV-2.44 Washing the hands with soap and water will suffice (there is no requirement to apply antibacterial soaps), rubbing the hands for at least 40-60 seconds. Hydroalcoholic hand sanitisers are an alternative for rapid disinfection although they should only be applied once the hands are clean. • Detecting infected cases and possible carriers. In the case of symptomatic cases, it is easier to comply with the measure.: However, it is essential to maintain

a finding policy for asymptomatic carriers and to avoid any possible exposure. The policies put in place may vary from one site to another, although, common speaking, carrying out exams on all workers is suggested, as is enforcing certain measures that will make it possible to find potentially infected subjects when they come to the radiology unit.

13. PREVENTIVE AND THERAPEUTIC APPROACHES TO ORTHOPEDIC AND SPORTS MEDICINE INTERVENTIONS DURING THE COVID-19 PANDEMIC

Transportation of the trauma patient to hospital

In principle, all the injured cases should be transported to the nearest medical center with appropriate isolation facilities, adequate levels of PPE and the ability to diagnose and treat COVID19 cases. The ambulance is exposed to high concentration of aerosol for a long time in a relatively closed environment, and must

be cleaned and disinfected thoroughly. Negative pressure ambulances are recommended. Only cases with excluded infection of COVID-19 can be sent to the general emergency ward, the rest should be sent to the COVID-19-designated medical center for management.

Protection of Healthcare Workers in the Emergency Room (ER)

All personnel who receive cases with suspected or approved COVID-19 require at least level-two PPE in the emergency room (ER). If the case is unconscious, or his/her family members cannot state the epidemiological history, the suspected subjects shall be managed as COVID-19. During pandemic, all cases should be managed as suspected subjects of COVID-19. Appropriate PPE

and disinfection of medical equipment is important.

PPE in the Operating Room

The door of the operating room should be shown with a COVID-19 sign. Personnel should be reduced in the operating room. Visitors to the OR should be restricted and medical staff should not enter or leave the operating room to avoid interrupting the negative pressure. Level-three PPE is needed in the operating room for all personnel, except patrol nurses/runners who can apply level-two PPE. The operating room must be in a state of negative pressure (−5 Pa) before the surgery. The buffer room should be closed, and instrument should be reduced in the operating room. Personnel using PPE in the

operating room are forbidden to leave the operating room until the PPE has been removed and the operation has finished. Cases with non-generalized anesthesia should use surgical masks throughout the surgery. For cases under general anesthesia, a breathing filter should be installed between the anesthetic mask and the respiration loop, and a breathing filter should be installed at the inhalation and exhalation end of the anesthesia machine, respectively.

Indications for Emergency Surgery

The criteria for emergency surgery is “threat to the patient’s life if surgery or intervention is not carried out, threat of permanent dysfunction of an extremity or organ system, risk of metastasis or progression of staging, risk

of rapidly worsening to severe manifestations". The main indications for emergency surgery at many centers are: trauma seriously endangering life or limb, such as fracture with hemorrhagic shock, suspected large blood vessel injuries and fracture with important organ impairments; Gustilo II–III open fractures, closed fracture with compartment syndrome, fracture with severe infection; unstable pelvic fractures and failure of closed reduction in dislocation of the hip joint with/without acetabular trauma; unstable spine fracture with spinal cord injury (AIS grade C or below), or progressive aggravation of neurological manifestations with/without Spinal Cord Compartment Syndrome (SCCS) or Spinal Cord Intramedullary Hypertension (SCImH). Patients with mild to moderate COVID-19 are managed as above, whereas those with severe

COVID-19 are more likely to be managed non-operatively. In other words, severe COVID-19 is a relative contraindication for emergency orthopedic surgery. Cases with critical COVID-19 or those who are intolerant to operation or anesthesia are a definite contraindication.

14. PREVENTIVE AND THERAPEUTIC APPROACHES TO PHARMACEUTICAL CONSULTATIONS DURING THE COVID-19 PANDEMIC

General Recommendations

SARS-CoV-2, the novel coronavirus strain responsible for the present pandemic of COVID-19, has rendered the entire humanity suffering. Several months have passed since the pandemic has struck. However, the world is still investigating an effective care plan to battle the viral infection. The first vaccine just received emergency approval in December 2020 for use in USA and UK.

These are excellent news, however, the worldwide distribution of such vaccine, the possibility of virus mutation and the lack of evidence about the long-term effects of such vaccines are an important concern. Furthermore, although remdesivir was recently confirmed by the FDA to be applied as a clinical drug against COVID-19, it hasn't stood out yet as a proven form of therapeutics. Such inability to generate a novel treatment has caused enough inconveniences for the affected subjects worldwide. Repurposing the already available treatments to fight against the virus is thought to be a reasonable choice amidst such uncertainty. Given the vast collection of potential treatment candidates to be assessed against COVID-19, there is a decent chance that a success in this regard will serve the intermediary aim of clinically treating the infection until

a COVID-19 vaccine is widely distributed worldwide and will be able to treat COVID-19 cases that do not appropriately respond to vaccines. Such cares may prove very effective in future coronavirus outbreaks too. Appropriate investigation into these repurposing cares may yield a certain insight into the field of novel treatment synthesis as well. This book accumulated a relevant set of data about treatments, preventions, and vaccines against COVID-19, in terms of their repurposing characteristics and the specific phases of clinical trials they are undergoing across the world. A potential timeline is also recommended to estimate when an effective result can be expected from the ongoing clinical trials for a better anticipation of the drug landscape. This investigation will hopefully help accelerate investment of resources into development and

discovery of drugs and vaccines against the infection.

Summary of WHO guideline

The linked systematic review and network meta-analysis showed that hydroxychloroquine had a small or no role in mortality and admission to hospital (high certainty evidence). There was a small or no role in laboratory approved SARS-CoV-2 infection (moderate certainty evidence) but probably enhanced adverse events causing discontinuation (moderate certainty evidence). The panel judged that almost all cases would not consider this drug worthwhile. Furthermore, the panel decided that contextual factors such as resources, feasibility, acceptability, and equity for regions and healthcare systems

were unlikely to change the suggestion. The panel considers that this agent is no longer a research priority and that resources should rather move to assess other more promising treatments to prevent covid-19.

Vaccines

Vaccination is the most effective way to reduce rate of SARS-CoV-2 infection. The COVID-19 Treatment recommendations Panel (the Panel) suggests COVID-19 vaccination as soon as possible for everyone who is candidate according to CDC's Advisory Committee on Immunization Practices (AI). For primary and booster vaccinations, the mRNA vaccines (i.e., BNT162b2 [Pfizer-BioNTech] or mRNA-1273 [Moderna]) are suggestive to the Ad26.COV2.S (Johnson & John-

son/Janssen) vaccine due to its risk of important adverse events. A primary series of COVID-19 vaccinations is suggested for everyone aged ≥5 years in the United States. Everyone aged ≥12 years should also receive a booster dose at least 5 months after completion of the primary series of an mRNA vaccine (BNT162b2 or mRNA-1273) or at least 2 months after receipt of the primary, single-dose Ad26.COV2.S vaccine. The type and dose of vaccine and the timing of the primary and booster vaccinations are related to the recipient's age and underlying medical status. CDC regularly updates the clinical notes for application of the COVID-19 vaccines currently confirmed by the Food and Drug Administration (FDA) or authorized for application in the United States.

15. PREVENTIVE AND THERAPEUTIC APPROACHES TO THE NURSING CARES DURING THE COVID-19 PANDEMIC

Historical Background

The application of personal protective equipment (PPE) decreases the risk of transmission but does not fully delete it. In China, it has been shown that 2055 HCP working in 476 different medical centers, mainly from Hubei (88%), have been infected with COVID-19 from December 18, 2019 to February 20, 2020. It is noted that the cause for this high rate of infection among HCP stems from shifts that last more

than 10 h a day due to the large number of cases and serious personnel shortages. Moreover, excessive fatigue and stress weaken the immune system and therefore, increase the sensitivity to COVID-19. As the infection widened rapidly, it was shown that there has been a rapid reduction in the availability of PPE, and a rapid increase in infection in HCP that caused a higher rate of transmission among visitors, staff, and cases.

In an investigation with 138 cases from China, it was shown that 57 cases (41.3%) were infected in the medical centers, among these cases 17 (12.3%) of them were in the medical center for other reasons and 40 (29%) of them were HCP. Among these infected HCP, 31 (77.5%) were working in clinical services, 7 (17.5%) in emergency wards, and 2 (5%) in intensive care units (ICU), respectively.

Intervention to Decrease Exposure Risk

In order to prevent the transmission from cases to healthcare workers, the essential precautions should be carried out that comprise the whole process, which start with the admission of the case to the medical centers. Moreover, interventions like elective surgeries and common check-ups should be delayed. For acute respiratory infection symptoms (ARIS) admissions triage guidelines should be made. These guidelines initiate with restriction of entry points to the medical centers. The cases who come to the medical centers should be given face masks and be told to use them at all times. HCP should be fully equipped with PPE and should be ready. The

cases who are suspected of COVID-19 should be isolated safely and rapidly.

Hospital entrances, cases rooms, and waiting rooms should be equipped with hand disinfectants that are 60–95% alcohol and waste containers that can be applied without contact. A physical barrier made of glass or plastic should be placed in order to separate triage staff and possible infectious cases to restrict close contact. Evaluation rooms should be big enough so that there can be 2 m between the HCP and the cases. These rooms should also be available for ventilation.

HCP that has been in close contact with or work in care of a COVID-19 case is under risk of getting infected by COVID-19. Centers for Disease Control and Prevention (CDC) states close contact as, being in the same environment with

an infected case without maintaining the 2 m minimum distance and being in direct contact with secretions of the infected case. The national interim recommendation of Ireland states close contact as being in face to face contact with a diagnosed COVID-19 case without maintaining 2 m distance for more than 15 min. The same recommendation also states conducting any intervention that makes aerosol without essential PPE or being in this room while this intervention is taking place without the essential PPE, or any contact with the case, bodily fluids of the case or laboratory samples of the case without using essential PPE as close contact.

Transmission from HCP to HCP is as significant of a transmission way as from case. One of the interventions that will decrease the risk of transmission among HCP is making groups

among providers who work in medical centers and labs. By doing this, social distancing can be maintained, and the risk of cross-infection can be decreased. All HCP should be assessed twice a day for ARIS manifestations, and body temperature to enhance the chances of early detection. If a member of the group is infected with COVID-19, all close contacts should take quarantine interventions.

Isolation Measures for Preventing Transmission of COVID-19

HCP should take protective interventions assuming that everyone is potentially infected or is colonized with a pathogen that can be transmitted in a healthcare condition. In order to prevent COVID-19 transmission HCP should take

more interventions for contact during aerosol generating procedures (AGPs) alongside standard interventions for droplets, close contact, and airborne transmission. One of the primary interventions that will decrease the transmission in health institutions is ensuring hand hygiene.

Hand Hygiene

HCP should ensure their hand hygiene before and after contact with a case, after contact with potentially infected material, and before and after using PPE. Since bare hands can get contaminated while taking off PPE, conducting essential steps to ensure hand hygiene is of great significance. HCP should wash their hands or at least 20 s using soap and water or should disinfect their hands with 60–95% alcohol-based

hand disinfectant. If the hands got visibly contaminated, they should be washed with soap and water. The hand hygiene should also be ensured before and after going into critical wards.

REFERENCES

1. Dub N, Konopińska J, Obuchowska I, Lisowski Ł, Dmuchowska DA, Rękas M. The Impact of the COVID-19 Pandemic on Ophthalmology Residents: A Narrative Review. Int J Environ Res Public Health. 2021;18.(21)

2. Miller LH, Parks J, Yowell R. The Impact of COVID-19 on Financing of Psychiatric Services. Psychiatr Clin North Am. 2022;45(1):161-77.

3. Fick TA, Cua CL, Lee S. Imaging Findings in Pediatric COVID-19: A Review of Current Literature. Cardiol Ther. 2022:1-17.

4. Regmi PR, Amatya I, Paudel S, Kayastha P. Pediatric Radiology in Era of COVID-19, International Consensus and What Lies Beyond Pneumonia: A Review. JNMA J Nepal Med Assoc. 2021;59(243):1196-203.

5. Kumar S, Shah B, Johari A, Anjum R, Garg D, Salhotra R, et al. Covid-19 Pandemic: Resumption of Orthopedic Care and Medical Education. Indian J Orthop. 2021;55(2):506-15.

6. Niznick N, Lun R, Gotfrit R, Deguise MO, Ramsay T, Blacquiere D, et al. Resident Match During the COVID Pandemic: How have Neurology Programs Adapted? - A Survey. Can J Neurol Sci. 2022:1-31.

7. Benedek I, Hapca E, Vacaras V, Mureșanu D. Clinical neurology during the COVID-19 pandemic - physicians in training perspective series. J Med Life. 2022;15(1):1-3.

8. Park JW, Kim BJ. Lessons from

COVID-19 in Clinical Neurology. J Clin Neurol. 2022;18(1):1-2.

9. Algahtani HA, Shirah BH. Rapid implementation of telemedicine in Neurology during the COVID-19 pandemic: Challenges in King Abdulaziz Medical City-Jeddah. Neurosciences (Riyadh). 2022;27(1):4-9.

10. Sethi PK, Sethi NK. WhatsApp Neurology: Meeting the Challenges of Teleneurology in India during the COVID-19 Pandemic. Ann Indian Acad Neurol. 2021;24(5):777-8.

11. Ser MH, Tanrıverdi U, Özkara Ç, Saip S, Aliş C, Güleç ZEK, et al. Analysis of neurology consultations in hospitalized patients with COVID-19. Acta Neurol Belg. 2022:1-8.

12. Nakornchai T, Conci E, Hensiek A,

Brown JWL. Clinician and patient experience of neurology telephone consultations during the COVID-19 pandemic. Postgrad Med J. 2021.

13. Bonakdarpour B, McFadden A, Zlotkowski S, Huang D, Shaker M, Shibata B, et al. Neurology Telemusic Program at the Time of the COVID-19 Pandemic: Turning Hospital Time Into Aesthetic Time During Crisis. Front Neurol. 2021;12:749782.

14. Alhajala H, Ramadan AR, Suneja A, Schultz L, Zaman IF. Single-centre study surveying neurology trainees' and faculty's perceptions of the impact of the COVID-19 pandemic on residents' medical education. BMJ Neurol Open. 2021;3(2):e000184.

15. Turalde CWR, Espiritu AI, Macinas IDN, Jamora RDG. Burnout among neurology resi-

dents during the COVID-19 pandemic: a national cross-sectional study. Neurol Sci. 2022;43(3):1503-11.

16. Qureshi AI, Rheaume C, Huang W, Lobanova I, Govindarajan R, French BR, et al. COVID-19 Exposure During Neurology Practice: Results of American Academy of Neurology Survey. Neurologist. 2021;26(6):225-30.

17. Aghoram R, Wadwekar V, Narayan SK, Nair PP, Ramkumar S, Jain S. Neurology Exams during the COVID-19 Pandemic. Ann Indian Acad Neurol. 2021;24(4):626-7.

18. Gummerson CE, Lo BD, Porosnicu Rodriguez KA, Cosner ZL, Hardenbergh D, Bongiorno DM, et al. Broadening learning communities during COVID-19: developing a curricular framework for telemedicine education in

neurology. BMC Med Educ. 2021;21(1):549.

19. Cuneo AZ, Maisha K, Minen MT. Strategies for Behavioral Research in Neurology: Lessons Learned During the COVID-19 Pandemic and Applications for the Future. Curr Neurol Neurosci Rep. 2021;21(11):63.

20. Filipska K, Biercewicz M, Wiśniewski A, Jabłońska R, Królikowska A, Główczewska-Siedlecka E, et al. High Rate of Elder Abuse in the Time of COVID-19-A Cross Sectional Study of Geriatric and Neurology Clinic Patients. J Clin Med. 2021;10.(19)

21. Ch'ang JH, Ford J, Cifrese L, Woodward E, Mears J, Lowrie R, et al. Preparing Neurology Residents and Advanced Practice Providers for the COVID-19 ICU-A Neurocritical Care Led Intervention. Neurohospitalist.

2021;11(4):342-7.

22. Snider BJ, Holtzman DM. Effects of COVID-19 on preclinical and clinical research in neurology: Examples from research on neurodegeneration and Alzheimer's disease. Neuron. 2021;109(20):3199-202.

23. Siegler JE, Boreskie PE, Strowd R, Rook R, Goss A, Al-Mufti F, et al. Neurology podcast utilization during the COVID-19 pandemic. Neurol Sci. 2021;42(11):4437-45.

24. Tassorelli C, Silani V, Padovani A, Barone P, Calabresi P, Girlanda P, et al. The contribution of the Italian residents in neurology to the COVID-19 crisis: admirable generosity but neurological training remains their priority. Neurol Sci. 2021;42(11):4425-31.

25. Kumar R, Harilal S, Sabitha M, Pappachan

LK, Roshni PR, Mathew B. Current perspective of COVID-19 on neurology: A mechanistic insight. Comb Chem High Throughput Screen. 2021.

26. Bain JM, Dyer CA, Galvin M, Goldman S, Selman J, Silver WG, et al. How Providers in Child Neurology Transitioned to Telehealth During COVID-19 Pandemic. Child Neurol Open. 2021;8:2329048x211022976.

27. Athamneh M, Sa'di Q, Aldabbour B, Khader Y, Batayha W. Knowledge, attitudes, and impact of COVID-19 pandemic among neurology patients in Jordan: a cross-sectional study. Egypt J Neurol Psychiatr Neurosurg. 2021;57(1):104.

28. Jillella DV, Nahab F, Nguyen TN, Abdalkader M, Liebeskind DS, Vora N, et al. Delays in thrombolysis during COVID-19 are as-

sociated with worse neurological outcomes: the Society of Vascular and Interventional Neurology Multicenter Collaboration. J Neurol. 2022;269(2):603-8.

29. Marsh EB, Kornberg M, Kessler K, Haq I, Patel AD, Nath A, et al. COVID-19 and Vaccination in the Setting of Neurologic Disease: An Emerging Issue in Neurology. Neurology. 2021;97(15):720-8.

30. Dratch L, Paul RA, Baldwin A, Brzozowski M, Gonzalez-Alegre P, Tropea TF, et al. Transitioning to telegenetics in the COVID-19 era: Patient satisfaction with remote genetic counseling in adult neurology. J Genet Couns. 2021;30(4):974-83.

31. Lap-Tak Ma A, Leung D, Yu-Hin Chan E, Chim S, Cheng S, Tsz-Wai Ho F, et al. Antibody

responses to 2 doses of mRNA Covid vaccine in pediatric renal patients. Kidney Int. 2022.

32. Gur E, Levy D, Topaz G, Naser R, Wand O, Kitay-Cohen Y, et al. Disease severity and renal outcomes of patients with chronic kidney disease infected with COVID-19. Clin Exp Nephrol. 2022:1-8.

33. Gambella A, Barreca A, Biancone L, Roccatello D, Peruzzi L, Besso L, et al. Spectrum of Kidney Injury Following COVID-19 Disease: Renal Biopsy Findings in a Single Italian Pathology Service. Biomolecules. 2022;12.(2)

34. Bevilacqua M, Induruwage D, Williams J, Djurdjev O, Levin A. Adverse changes in key chronic kidney disease care outcome metrics since onset of the COVID-19 pandemic; experience from an established provincial renal pro-

gram. Kidney Int. 2022.

35. Roushani J, Thomas D, Oliver MJ, Ip J, Tang Y, Yeung A, et al. Acute kidney injury requiring renal replacement therapy in people with COVID-19 disease in Ontario, Canada: a prospective analysis of risk factors and outcomes. Clin Kidney J. 2022;15(3):507-16.

36. Kurien AA, Srinivasaprasad ND, Valavan KT. Renal infarction due to COVID-19-associated renal mucormycosis. Kidney Int. 2022;101(3):655.

37. Kang K, Luo Y, Gao Y, Zhang J, Wang C, Fei D, et al. Continuous Renal Replacement Therapy With oXiris Filter May Not be an Effective Resolution to Alleviate Cytokine Release Syndrome in Non-AKI Patients With Severe and Critical COVID-19. Front Pharmacol. 2022;13:817793.

38. Morita Y, Kurano M, Jubishi D, Ikeda M, Okamoto K, Tanaka M, et al. Urine sediment findings were milder in patients with COVID-19-associated renal injuries than in those with non-COVID-19-associated renal injuries. Int J Infect Dis. 2022;117:302-11.

39. Panimathi R, Gurusamy E, Mahalakshmi S, Ramadevi K, Kaarthikeyan G, Anil S. Impact of COVID-19 on Renal Function: A Multivariate Analysis of Biochemical and Immunological Markers in Patients. Cureus. 2022;14(2):e22076.

40. Chiao C, Faust H, Singh T. Regional citrate and systemic heparin are adequate to maintain filter half-life for COVID-19 patients on continuous renal replacement therapy. Semin Dial. 2022.

41. Rhoney DH, Brooks AB, Nelson NR. Aug-

mented Renal Clearance: An Under-Recognized Phenomenon Associated With COVID-19. Crit Care Explor. 2022;4(2):e0617.

42. Roch T, Rohn B, Blazquez-Navarro A, Meister TL, Blanco EV, Paniskaki K, et al. A vector-based vaccine dose after three doses of mRNA-based COVID-19 vaccination does not substantially improve humoral SARS-CoV-2 immunity in renal transplant recipient. Kidney Int Rep. 2022.

43. Park JS, Lee EY. Renal side effects of COVID-19 vaccines in patients with immunoglobulin A nephropathy. Kidney Res Clin Pract. 2022;41(1):124-7.

44. Özlü SG, Aydın Z, Bozelli BN, Avcı B, İnözü M, Çaycı F, et al. Can microalbuminuria be an ındicator of renal ınvolvement in pediatric Covid

19 patients? Infection. 2022:1-6.

45. Lombardi R, Ferreiro A, Ponce D, Claure-Del Granado R, Aroca G, Venegas Y, et al. Latin American registry of renal involvement in COVID-19 disease. The relevance of assessing proteinuria throughout the clinical course. PLoS One. 2022;17(1):e0261764.

46. Meyyappan J, Prasad N, Kushwaha R, Patel M, Behera M, Bhadauria D, et al. Health-Related Quality of Life Score and Outcomes in Living Donor Renal Transplant Recipients With COVID-19. Exp Clin Transplant. 2022;20(1):42-51.

47. Zolotov E, Sigal A, Havrda M, Jeřábková K, Krátká K, Uzlová N, et al. Can Renal Parameters Predict the Mortality of Hospitalized COVID-19 Patients? Kidney Blood Press Res. 2022.

48. Holt DB, Lardaro T, Wang AZ, Musey PI, Jr., Trigonis R, Bucca A, et al. Fluid Resuscitation and Progression to Renal Replacement Therapy in Patients With COVID-19. J Emerg Med. 2022;62(2):145-53.

49. Dugbartey GJ, Alornyo KK, Ohene BO, Boima V, Antwi S, Sener A. Renal consequences of the novel coronavirus disease 2019 (COVID-19) and hydrogen sulfide as a potential therapy. Nitric Oxide. 2022;120:16-25.

50. Samaan F, Carneiro de Paula E, de Lima Souza FBG, Mendes LFC, Rossi PRG, Freitas RAP, et al. COVID-19-associated acute kidney injury patients treated with renal replacement therapy in the intensive care unit: A multicenter study in São Paulo, Brazil. PLoS One. 2022;17(1):e0261958.

51. Baleguli V, Mahmood R, Herrera M, Raybon-Rojas E. Heparin-Induced Renal Tubular Acidosis Masquerading as Hyperkalemia in a SARS-CoV-2 (COVID-19) Patient: A Case Report. Cureus. 2021;13(12):e20312.

52. Asghar MS, Ahsan MN, Akram M, Hassan M, Rasheed U, Adnan SM. Frequency of deranged renal profile in patients with COVID-19: Tertiary Care Experience from a developing country. Saudi J Kidney Dis Transpl. 2021;32(2):377-86.

53. Veterano C, Antunes I, Coelho A, Silva I, Almeida R, Pinto PS. Endovascular Treatment of Renal Artery Thrombosis in Living-Donor Kidney Transplant Recipient With Severe COVID-19 Disease. J Endovasc Ther. 2022:15266028211068756.

54. Hebert SA. Renal Consequences of

COVID-19. Methodist Debakey Cardiovasc J. 2021;17(5):91-3.

55. Carr R, Moreland H, Hsia MH. Late-stage primary renal angiosarcoma: an extremely rare cancer complicated by COVID-19 post-operatively. J Surg Case Rep. 2021;2021(12):rjab562.

56. Magnocavallo M, Vetta G, Bernardini A, Piro A, Mei MC, Di Iorio M, et al. Impact of COVID-19 Pandemic on Cardiac Electronic Device Management and Role of Remote Monitoring. Card Electrophysiol Clin. 2022;14(1):125-31.

57. Hwang R, Fan T, Bowe R, Louis M, Bertram M, Morris NR, et al. Home-based and remote functional exercise testing in cardiac conditions, during the covid-19 pandemic and beyond: a systematic review. Physiotherapy.

2021;115:27-35.

58. Siripanthong B, Asatryan B, Hanff TC, Chatha SR, Khanji MY, Ricci F, et al. The Pathogenesis and Long-Term Consequences of COVID-19 Cardiac Injury: State-of-the-Art Review. JACC Basic Transl Sci. 2022.

59. Batta Y, King C, Johnson J, Haddad N, Boueri M, Haddad G. Sequelae and Comorbidities of COVID-19 Manifestations on the Cardiac and the Vascular Systems. Front Physiol. 2021;12:748972.

60. Cubeddu LX, de la Rosa D, Ameruoso M. Antiviral and anti-inflammatory drugs to combat COVID-19: Effects on cardiac ion channels and risk of ventricular arrhythmias. Bioimpacts. 2022;12(1):9-20.

61. Jafari-Oori M, Moradian ST, Ebadi A, Ja-

fari M, Dehi M. Incidence of cardiac complications following COVID-19 infection: An umbrella meta-analysis study. Heart Lung. 2022;52:136-45.

62. Schoene D, Schnekenberg LG, Pallesen LP, Barlinn J, Puetz V, Barlinn K, et al. Pathophysiology of Cardiac Injury in COVID-19 Patients with Acute Ischaemic Stroke: What Do We Know So Far?-A Review of the Current Literature. Life (Basel). 2022;12.(1)

63. Anghel R, Adam CA, Marcu DTM, Mitu O, Mitu F. Cardiac Rehabilitation in Patients with Peripheral Artery Disease-A Literature Review in COVID-19 Era. J Clin Med. 2022;11.(2)

64. Mishra K, Edwards B. Cardiac Outpatient Care in a Digital Age: Remote Cardiology Clinic Visits in the Era of COVID-19. Curr Cardiol Rep.

2022;24(1):1-6.

65. Feijen M, Egorova AD, van der Velde ET, Schalij MJ, Beeres S. No substantial excess all-cause mortality among cardiac implantable electronic device patients during the first COVID-19 lockdown in the Leiden area. Neth Heart J. 2022;30(2):76-83.

66. Wang X, Gao H, Zhang Z, Deng C, Yan Y, Shi T. Effect of the COVID-19 pandemic on complications and mortality of patients with cardiac surgery. J Cardiothorac Surg. 2021;16(1):361.

67. Stefanakis M, Batalik L, Papathanasiou J, Dipla L, Antoniou V, Pepera G. Exercise-based cardiac rehabilitation programs in the era of COVID-19: a critical review. Rev Cardiovasc Med. 2021;22(4):1143-55.

68. Sanchez Tijmes F, Thavendiranathan P,

Udell JA, Seidman MA, Hanneman K. Cardiac MRI Assessment of Nonischemic Myocardial Inflammation: State of the Art Review and Update on Myocarditis Associated with COVID-19 Vaccination. Radiol Cardiothorac Imaging. 2021;3(6):e210252.

69. Fazlollahi A, Zahmatyar M, Noori M, Nejadghaderi SA, Sullman MJM, Shekarriz-Foumani R, et al. Cardiac complications following mRNA COVID-19 vaccines: A systematic review of case reports and case series. Rev Med Virol. 2021:e2318.

70. Lippi G, Sanchis-Gomar F, Henry BM, Lavie CJ. Cardiac Biomarkers in COVID-19: A Narrative Review. Ejifcc. 2021;32(3):337-46.

71. Vitiello A, Ferrara F. Risk of drug-induced cardiac arrhythmia during COVID-19 thera-

peutic treatment. Egypt Heart J. 2021;73(1):103.

72. Mohammad M, Emin M, Bhutta A, Gul EH, Voorhees E, Afzal MR. Cardiac arrhythmias associated with COVID-19 infection: state of the art review. Expert Rev Cardiovasc Ther. 2021;19(10):881-9.

73. Duckheim M, Schreieck J. COVID-19 and Cardiac Arrhythmias. Hamostaseologie. 2021;41(5):372-8.

74. Han JK, Baykaner T, DeSimone CV, Etheridge SP, Futyma P, Saha SA, et al. Virtual Transformation and the Use of Social Media: Cardiac Electrophysiology Education in the Post-COVID-19 Era. Curr Treat Options Cardiovasc Med. 2021;23(11):70.

75. Satterfield BA, Bhatt DL, Gersh BJ. Cardiac involvement in the long-term implications of

COVID-19. Nat Rev Cardiol. 2021:1-10.

76. Akkawi AR, Ghazal M. COVID-19 and Cardiac Arrhythmias: A Review of the Literature. Cureus. 2021;13(9):e17797.

77. Akter F, Araf Y, Naser IB, Promon SK. Prospect of 3D bioprinting over cardiac cell therapy and conventional tissue engineering in the treatment of COVID-19 patients with myocardial injury. Regen Ther. 2021;18:447-56.

78. Wu EY, Campbell MJ. Cardiac Manifestations of Multisystem Inflammatory Syndrome in Children (MIS-C) Following COVID-19. Curr Cardiol Rep. 2021;23(11):168.

79. Prasad S, Bassett IV, Freeman EE. Dermatology on the global stage: The role of dermatologists in international health advocacy and COVID-19 research. Int J Womens Dermatol.

2021;7(5):653-9.

80. Hannah C, Williams V, Fuller LC, Forrestel A. The Impact of the COVID-19 Pandemic on Global Health Dermatology. Dermatol Clin. 2021;39(4):619-25.

81. Samimi S, Choi J, Rosman IS, Rosenbach M. Impact of COVID-19 on Dermatology Residency. Dermatol Clin. 2021;39(4):609-18.

82. Freeman EE, Chamberlin GC, McMahon DE, Hruza GJ, Wall D, Meah N, et al. Dermatology COVID-19 Registries: Updates and Future Directions. Dermatol Clin. 2021;39(4):575-85.

83. Neale H, Hawryluk EB. COVID-19 Pediatric Dermatology. Dermatol Clin. 2021;39(4):505-19.

84. Agnihothri R, Fox LP. Clinical Patterns and Morphology of COVID-19 Dermatology.

Dermatol Clin. 2021;39(4):487-503.

85. Mansouri P, Farshi S, Nikkhah N, Nobari NN, Chalangari R, Nilforoushzadeh MA. Immunosuppressive and immunomodulatory therapies in dermatology and coronavirus disease 2019 (COVID-19). Clin Dermatol. 2021;39(3):517-20.

86. Lim RK, Kalagara S, Chen KK, Mylonakis E, Kroumpouzos G. Dermatology in a multidisciplinary approach with infectious disease and obstetric medicine against COVID-19. Int J Womens Dermatol. 2021;7(5):640-6.

87. Mathachan SR, Sardana K, Khurana A. Current Use of Ivermectin in Dermatology, Tropical Medicine, and COVID-19: An Update on Pharmacology, Uses, Proven and Varied Proposed Mechanistic Action. Indian Dermatol Online J. 2021;12(4):500-14.

88. Alam M, Lewis W, Harp J, Steele K, Rosenbach M, Micheletti RG. Cutaneous Manifestations of COVID-19: Characteristics, Pathogenesis, and the Role of Dermatology in the Pandemic. Cutis. 2021;107(4):209-15.

89. Vashisht D, Neema S, Venugopalan R, Pathania V, Sandhu S, Vasudevan B. Dermatology practice in the times of the COVID-19 pandemic. Indian J Dermatol Venereol Leprol. 2021;87(5):603-10.

90. Wang C, Rademaker M, Tate B, Baker C, Foley P. SARS-CoV-2 (COVID-19) vaccination in dermatology patients on immunomodulatory and biologic agents: Recommendations from the Australasian Medical Dermatology Group. Australas J Dermatol. 2021;62(2):151-6.

91. Al-Khateeb B. Primary health care

and family physicians provide frontline care to the dermatology patients during the era of COVID-19: Recommendations and future directions. J Family Med Prim Care. 2020;9(12):5862-6.

92. Ladha MA, Lui H, Carroll J, Doiron P, Kirshen C, Wong A, et al. Medical Student and Resident Dermatology Education in Canada During the COVID-19 Pandemic [Formula: see text]. J Cutan Med Surg. 2021;25(4):437-42.

93. Schwartz RA, Pradhan S, Murrell DF, Jafferany M, Olisova OY, Lomonosov KM, et al. COVID-19 and immunosuppressive therapy in dermatology. Dermatol Ther. 2020;33(6):e14140.

94. Criado PR, Pagliari C, Carneiro FRO, Quaresma JAS. Lessons from dermatology about

inflammatory responses in Covid-19. Rev Med Virol. 2020;30(5):e2130.

95. Gül Ü. COVID-19 and dermatology. Turk J Med Sci. 2020;50(8):1751-9.

96. Egger A, Abrouk M, Brodsky M, Kirsner RS. COVID-19 Supply Chain Considerations for Prescription Drugs in Dermatology. J Drugs Dermatol. 2020;19(6):666-7.

97. Stojkovic-Filipovic J, Bosic M. Treatment of COVID 19-Repurposing drugs commonly used in dermatology. Dermatol Ther. 2020;33(5):e13829.

98. Fahmy DH, El-Amawy HS, El-Samongy MA, Fouda AA, Soliman SH, El-Kady A, et al. COVID-19 and dermatology: a comprehensive guide for dermatologists. J Eur Acad Dermatol Venereol. 2020;34(7):1388-94.

99. Wollina U. Challenges of COVID-19 pandemic for dermatology. Dermatol Ther. 2020;33(5):e13430.

100. Ali FR, Al-Niaimi F. Noncutaneous considerations of COVID-19 for dermatology practices. J Cosmet Dermatol. 2020;19(7):1544.

101. Değirmenci MFK, Yalçındağ FN, Tugal-Tutkun İ. COVID-19 and the Use of Immunomodulatory Agents in Ophthalmology. Turk J Ophthalmol. 2021;51(4):231-42.

102. Choritz L, Hoffmann M, Thieme H. [Telemedical applications in ophthalmology in times of COVID-19]. Ophthalmologe. 2021;118(9):885-92.

103. Dos Santos Martins TG, Dos Santos Martins DG, Dos Santos Martins TG, Marinho P, Schor P. COVID 19 repercussions in ophthalmology: a narrative review. Sao Paulo Med J. 2021;139(5):535-42.

104. Almazroa A. Sustainability of Ophthalmology Practice and Training During and Post the Pandemic of Coronavirus (COVID-19): A Review. Clin Ophthalmol. 2021;15:2355-65.

105. Lai THT, Tang EWH, Li KKW. The Implications of COVID-19 to Ophthalmology. Adv Exp Med Biol. 2021;1318:637-55.

106. Delsoz M, Hollands P. Ophthalmology practice in Afghanistan during the COVID-19 pandemic. Eur Rev Med Pharmacol Sci. 2021;25(6):2726-9.

107. Tham YC, Husain R, Teo KYC, Tan ACS, Chew ACY, Ting DS, et al. New digital models of care in ophthalmology, during and beyond the COVID-19 pandemic. Br J Ophthalmol. 2021.

108. Idris M, Nathaniel E. Protective Modifications in Ophthalmology Practice during COVID-19 Pandemic: Challenges and Lessons Learned. J Coll Physicians Surg Pak. 2021;30(1):S32-s4.

109. Hoeferlin C, Hosseini H. Review of Clinical and Operative Recommendations for Ophthalmology Practices During the COVID-19 Pandemic. SN Compr Clin Med. 2021:1-6.

110. Gerbutavicius R, Brandlhuber U, Glück S, Kortüm GF, Kortüm I, Navarrete Orozco R, et al. Evaluation of patient satisfaction with an ophthalmology video consultation during the COVID-19 pandemic. Ophthalmologe. 2021;118(Suppl 1):89-95.

111. Prager KM, Dagi Glass LR, Wang M, Chen RWS, Liebmann JM, Cioffi GA. Ophthalmology

and Ethics in the COVID-19 Era. Am J Ophthalmol. 2021;224:158-62.

112. Kharel Sitaula R, Khatri A, Janani MK, Mandage R, Sadhu S, Madhavan HN, et al. Unfolding COVID-19: Lessons-in-Learning in Ophthalmology. Clin Ophthalmol. 2020;14:2807-20.

113. Wendt S, Abdullah Z, Barrett S, Daruwalla C, Go JA, Le B, et al. A virtual COVID-19 ophthalmology rotation. Surv Ophthalmol. 2021;66(2):354-61.

114. Sun S, Su W, Lin CQ, Li X, Yan H, Tian B, et al. COVID-19: the novel coronavirus disease and its manifestations and management in ophthalmology. Discov Med. 2020;29(158):145-57.

115. Hallak JA, Scanzera AC, Azar DT, Chan RVP. Artificial intelligence in ophthalmology during COVID-19 and in the post COVID-19 era.

Curr Opin Ophthalmol. 2020;31(5):447-53.

116. Khor WB, Yip L, Zhao P, Foo VHX, Lim L, Ting DSW, et al. Evolving Practice Patterns in Singapore's Public Sector Ophthalmology Centers During the COVID-19 Pandemic. Asia Pac J Ophthalmol (Phila). 2020;9(4):285-90.

117. Kumar G, Rehman F, Kelkar M. Biomedical waste management in dentistry during COVID-19 pandemic: What the guidelines recommend?? Natl J Maxillofac Surg. 2021;12(3):311-5.

118. Gupta A, Shah SG, Kaul B, Mahajan N, Gupta RK. The Epiphany of Post-COVID: A Watershed for Pediatric Dentistry. Int J Clin Pediatr Dent. 2021;14(6):802-11.

119. Kshirsagar MM, Dodamani AS, Deokar RN, Garg Y, Khobragade VR, Garg K. Impact of

COVID-19 on Dentistry. Int J Clin Pediatr Dent. 2021;14(5):711-4.

120. Javaid M, Haleem A, Pratap Singh R, Suman R. Pedagogy and innovative care tenets in COVID-19 pandemic: An enhancive way through Dentistry 4.0. Sens Int. 2021;2:100118.

121. Abedi N. Psychological effects of the COVID-19 pandemic on dentistry: A systematic review study. J Educ Health Promot. 2021;10:311.

122. Ramírez A, Ochoa D, Llanque G, Trelles B, Watanabe R, Alvitez-Temoche D, et al. Historical Evolution and Filtering Characteristics of Masks and Respirators in Dentistry in the Context of COVID-19: A Literature Review. J Int Soc Prev Community Dent. 2021;11(3):248-55.

123. Levit M, Levit L. Infection Risk of

COVID-19 in Dentistry Remains Unknown: A Preliminary Systematic Review. Infect Dis Clin Pract (Baltim Md). 2021;29(2):e70-e7.

124. Tonkaboni A, Amirzade-Iranaq MH, Ziaei H, Ather A. Impact of COVID-19 on Dentistry. Adv Exp Med Biol. 2021;1318:623-36.

125. Tayyebi H, Hasanikhah M, Heidarikhoo M, Fakoor S, Aminian A. Length of hospital stay and mortality of hip fracture surgery in patients with Coronavirus disease 2019 (COVID-19) infection: A systematic review and meta-analysis. Curr Orthop Pract. 2022;33(2):172-7.

126. Karachalios T, Maasalu K, Felländer-Tsai L. Personal protection equipment for orthopaedic and trauma surgery during the COVID-19 pandemic: The results of an EFORT survey initiative. EFORT Open Rev. 2022;7(2):122-8.

127. Bilkhu R, Billè A. Surgery for recurrent thymoma during the COVID-19 pandemic: a narrative review. Mediastinum. 2021;5:17.

128. Pagotto LEC, Santos TS, Pastore GP. Impact of COVID-19 on maxillofacial surgery practice: a systematic review. Braz J Otorhinolaryngol. 2021.

129. Comfort SM, Murata Y, Pierpoint LA, Philippon MJ. Management of Outpatient Elective Surgery for Arthroplasty and Sports Medicine During the COVID-19 Pandemic: A Scoping Review. Orthop J Sports Med. 2021;9(11):23259671211053335.

130. Bickford M, Rocha K. Impact of the COVID-19 Pandemic on Refractive Surgery. Curr Ophthalmol Rep. 2021;9(4):127-32.

131. Singhal R, Dickerson L, Sakran N, Pou-

wels S, Chiappetta S, Weiner S, et al. Safe Surgery During the COVID-19 Pandemic. Curr Obes Rep. 2021:1-12.

132. Friedrich AU, DiComo JA, Golshan M. The Impact of COVID-19 on Breast Surgery Fellowships. Curr Breast Cancer Rep. 2021:1-6.

133. Major AL, Jumaniyazov K, Yusupova S, Jabbarov R, Saidmamatov O, Mayboroda-Major I. Laparoscopy in Gynecologic and Abdominal Surgery in Regional (Spinal, Peridural) Anesthesia, the Utility of the Technique during COVID-19 Pandemic. Medicines (Basel). 2021;8.(10)

134. Bossone E, Cademartiri F, AlSergani H, Chianese S, Mehta R, Capone V, et al. Preoperative Assessment and Management of Cardiovascular Risk in Patients Undergoing Non-Cardiac Surgery: Implementing a Systematic Stepwise

Approach during the COVID-19 Pandemic Era. J Cardiovasc Dev Dis. 2021;8.(10)

135. Bram JT, Jia L, Huffman W, Ahn J. Orthopaedic Surgery Residency Program Social Media Presence During the COVID-19 Pandemic. JB JS Open Access. 2021;6.(4)

136. Gupta R, Mouawad NJ, Yi JA. The impact of the COVID-19 pandemic on vascular surgery: Health care systems, economic, and clinical implications. Semin Vasc Surg. 2021;34(3):74-81.

137. Haws BE, Mannava S, Schuster BK, DiGiovanni BF. Implementation and Evaluation of a Formal Virtual Medical Student Away Rotation in Orthopaedic Surgery During the COVID-19 Pandemic: A Single Institution Pilot Experience. JB JS Open Access. 2021;6.(3)

138. Andrews P, Anschuetz L, Baptista PM,

Bast F, Beule AG, De Carpentier J, et al. Awake Rhinology Surgery in Response to the COVID-19 Pandemic in Europe. ORL J Otorhinolaryngol Relat Spec. 2021:1-10.

139. Liu D, Cheng Q, Suh HR, Magdy M, Loi K. Role of bariatric surgery in a COVID-19 era: a review of economic costs. Surg Obes Relat Dis. 2021;17(12):2091-6.

140. Bishop R, Woerner JE, Stavropoulos F. Effects of the COVID-19 Pandemic on the Professional Career of Women in Oral and Maxillofacial Surgery. Oral Maxillofac Surg Clin North Am. 2021;33(4):475-80.

141. Brueggeman DA, Via GG, Froehle AW, Krishnamurthy AB. Virtual Interviews in the Era of COVID-19: Expectations and Perceptions of Orthopaedic Surgery Residency Candidates and

Program Directors. JB JS Open Access. 2021;6.(3)

142. Gordon AM, Malik AT, Scharschmidt TJ, Goyal KS. Cost Analysis of Medical Students Applying to Orthopaedic Surgery Residency: Implications for the 2020 to 2021 Application Cycle During COVID-19. JB JS Open Access. 2021;6.(1)

143. Djoutsop OM, Mbougo JV, Kanmounye US. Global head and neck surgery research during the COVID pandemic: A bibliometric analysis. Ann Med Surg (Lond). 2021;68:102555.

144. Fraser R, Steven M, McCall P, Shelley B. Anesthetic Management for Thoracic Surgery During the COVID-19 Pandemic. Curr Anesthesiol Rep. 2021;11(4):405-13.

145. Din T, Abdalla T, Chiesa-Estomba C, Simon F, Teissier N, Thomas I, et al. YO-IFOS Guidelines for Pediatric ENT Surgery during

COVID-19: An Overview of Recommendations. Laryngoscope. 2021;131(8):1876-83.

146. Sharma A, Bhardwaj R. COVID-19 and ENT surgery: a brief review of essential precautions and triage. Eur Arch Otorhinolaryngol. 2021;278(5):1301-5.

147. El-Anwar MW, Elzayat S, Fouad YA. ENT manifestation in COVID-19 patients. Auris Nasus Larynx. 2020;47(4):559-64.

148. Herman P, Vincent C, Parietti Winkler C, Loundon N, Couloigner V, Tankere F, et al. Consensus statement. Corticosteroid therapy in ENT in the context of the COVID-19 pandemic. Eur Ann Otorhinolaryngol Head Neck Dis. 2020;137(4):315-7.

149. Wan Mohd Yunus WMA, Kauhanen L, Sourander A, Brown JSL, Peltonen K, Mishina

K, et al. Registered psychiatric service use, self-harm and suicides of children and young people aged 0-24 before and during the COVID-19 pandemic: a systematic review. Child Adolesc Psychiatry Ment Health. 2022;16(1):15.

150. Kalyanasundaram S, Hemchand L, Sivakumar T. Psychiatric Rehabilitation During COVID-19 Pandemic: Richmond Fellowship Society (I), Bangalore Branch Experience. J Psychosoc Rehabil Ment Health. 2022:1-6.

151. Ghasemiyeh P, Mortazavi N, Karimzadeh I, Vazin A, Mahmoudi L, Moghimi-Sarani E, et al. Psychiatric Adverse Drug Reactions and Potential Anti-COVID-19 Drug Interactions with Psychotropic Medications. Iran J Pharm Res. 2021;20(3):66-77.

152. Putri C, Arisa J, Hananto JE, Hariy-

anto TI, Kurniawan A. Psychiatric sequelae in COVID-19 survivors: A narrative review. World J Psychiatry. 2021;11(10):821-9.

153. Albert H, Heipel D, Thakre TP, Hess O, Cooper K, Pryor R, et al. Management of the COVID-19-Infected Psychiatric Inpatients: Unique Infection Prevention Considerations and Evolving Strategies. Curr Treat Options Infect Dis. 2021;13(4):165-74.

154. Tripathy S, Singh N, Singh A, Kar SK. COVID-19 and Psychotic Symptoms: the View from Psychiatric Immunology. Curr Behav Neurosci Rep. 2021;8(4):172-8.

155. Puangsri P, Jinanarong V, Wattanapisit A. Impacts on and Care of Psychiatric Patients during the Outbreak of COVID-19. Clin Pract Epidemiol Ment Health. 2021;17:52-60.

156. Moslehi S, Aubrey-Jones D, Knowles M, Obeney-Williams J, Leveson S, Aref-Adib G. Cyberpsychiatry versus COVID-19: using video consultation to improve clinical care in an in-patient psychiatric unit. BJPsych Int. 2021;18(3):E10.

157. Gourret Baumgart J, Kane H, El-Hage W, Deloyer J, Maes C, Lebas MC, et al. The Early Impacts of the COVID-19 Pandemic on Mental Health Facilities and Psychiatric Professionals. Int J Environ Res Public Health. 2021;18.(15)

158. Troglio da Silva FC, Neto MLR. Psychiatric disorders in health professionals during the COVID-19 pandemic: A systematic review with meta-analysis. J Psychiatr Res. 2021;140:474-87.

159. Mu SC, Chien YH, Lai PZ, Chao KY. Hel-

met Ventilation for Pediatric Patients During the COVID-19 Pandemic: A Narrative Review. Front Pediatr. 2022;10:839476.

160. Dauletbaev N, Oftring ZS, Akik W, Michaelis-Braun L, Korel J, Lands LC, et al. A scoping review of mHealth monitoring of pediatric bronchial asthma before and during COVID-19 pandemic. Paediatr Respir Rev. 2022.

161. Dulek DE, Ardura MI, Green M, Michaels MG, Chaudhuri A, Vasquez L, et al. Update on COVID-19 vaccination in pediatric solid organ transplant recipients. Pediatr Transplant. 2022:e14235.

162. Pogorelić Z, Anand S, Žuvela T, Singh A, Križanac Z, Krishnan N. Incidence of Complicated Appendicitis during the COVID-19 Pandemic versus the Pre-Pandemic Period: A Sys-

tematic Review and Meta-Analysis of 2782 Pediatric Appendectomies. Diagnostics (Basel). 2022;12.(1)

163. Shaoul R, Day AS. Pediatric Endoscopy During COVID-19 Times. Front Pediatr. 2021;9:750717.

164. Afshari A, Disma N, von Ungern-Sternberg BS, Matava C. COVID-19 implications for pediatric anesthesia: Lessons learnt and how to prepare for the next pandemic. Paediatr Anaesth. 2022;32(2):385-90.

165. Calcaterra V, Verduci E, Vandoni M, Rossi V, Di Profio E, Carnevale Pellino V, et al. Telehealth: A Useful Tool for the Management of Nutrition and Exercise Programs in Pediatric Obesity in the COVID-19 Era. Nutrients. 2021;13.(11)

166. Tsang KK, Latchman A, Singhal N, Fed-

erici G, Russell S, Irwin D, et al. A survey on Canadian pediatric hospital clinical/medical teaching unit implementation during the first and second wave of the COVID-19 pandemic. BMC Med Educ. 2021;21(1):570.

167. Brun BN, Aylward SC. Pediatric Intracranial Hypertension: A Spotlight on Imaging, the Idiopathic Intracranial Hypertension Treatment Trial, and COVID-19 Associated Cases. Semin Pediatr Neurol. 2021;40:100922.

168. Walsh K, Furey WJ, Malhi N. Narrative review: COVID-19 and pediatric anxiety. J Psychiatr Res. 2021;144:421-6.

169. Taylor R, 3rd, Mallon D. COVID-19 and Pediatric Gastroenterology. Pediatr Clin North Am. 2021;68(6):1157-69.

170. Yang Z, Wang X, Wan XG, Wang ML,

Qiu ZH, Chen JL, et al. Pediatric asthma control during the COVID-19 pandemic: A systematic review and meta-analysis. Pediatr Pulmonol. 2022;57(1):20-5.

171. Blanchard-Rohner G, Didierlaurent A, Tilmanne A, Smeesters P, Marchant A. Pediatric COVID-19: Immunopathogenesis, Transmission and Prevention. Vaccines (Basel). 2021;9.(9)

172. Giorgi PD, Gallazzi E, Capitani P, D'Aliberti GA, Bove F, Chiara O, et al. How we managed elective, urgent, and emergency orthopedic surgery during the COVID-19 pandemic: The Milan metropolitan area experience. Bone Jt Open. 2020;1(5):93-7.

173. Motififard M, Teimouri M, Parhamfar M, Hatami S, Toghyani A. Management of orthopedic patients during COVID-19 outbreak. Int J

Burns Trauma. 2020;10(5):181-90.

174. Wu CL, Jules-Elysee KM, Kirksey MA, Liguori GA. Perioperative Nonsteroidal Anti-Inflammatory Agents in the COVID-19 Orthopedic Patient. Hss j. 2020;16(Suppl 1):97-101.

175. Reddy GB, Greif DN, Rodriguez J, Best TM, Greditzer HGt, Jose J. Clinical Characteristics and Multisystem Imaging Findings of COVID-19: An Overview for Orthopedic Surgeons. Hss j. 2020;16(Suppl 1):112-23.

176. Kalantar S, Farhoud A, Mortazavi J. Lockdown of an Orthopedic Department during COVID-19 Epidemics, Our Experience in a General Hospital. Arch Bone Jt Surg. 2020;8(Suppl1):235-41.

177. Basso T, Dale H, Langvatn H, Lønne G, Skråmm I, Westberg M, et al. Virus transmis-

sion during orthopedic surgery on patients with COVID-19 - a brief narrative review. Acta Orthop. 2020;91(5):534-7.

178. Melissa LM, Ting CS, Manful CMF, Li CH, Clara CCY, Jones CL, et al. A review of the effectiveness of fever tent setup in COVID-19 pandemic from a radiology perspective. J Med Imaging Radiat Sci. 2022;53(1):159-66.

179. Patil NS, Gunter D, Larocque N. The Impact of the COVID-19 Pandemic on Radiology Resident Education: Where Do We Go From Here? Acad Radiol. 2022;29(4):576-83.

180. Chen D, Ayoob A, Desser TS, Khurana A. Review of Learning Tools for Effective Radiology Education During the COVID-19 Era. Acad Radiol. 2022;29(1):129-36.

181. Pal A, Ali A, Young TR, Oostenbrink J,

Prabhakar A, Prabhakar A, et al. Comprehensive literature review on the radiographic findings, imaging modalities, and the role of radiology in the COVID-19 pandemic. World J Radiol. 2021;13(9):258-82.

182. Kooraki S, Hosseiny M, Velez EM, Gupta A, Gilkeson R, Raman SS, et al. COVID-19 pandemic revisited: lessons the radiology community has learned a year later. Emerg Radiol. 2021;28(6):1083-6.

183. Taylor A, Williams C. COVID-19: Impact on radiology departments and implications for future service design, service delivery, and radiology education. Br J Radiol. 2021;94(1127):20210632.

184. Nayeri ND, Nadali J, Divani A, Basirinezhad MH, Meidani M. Clinical manifest-

ation, laboratory and radiology finding, treatment and outcomes of COVID-19: A systematic review and meta-analysis. J Res Med Sci. 2021;26:41.

185. Sureka B, Garg PK, Saxena S, Garg MK, Misra S. Role of radiology in RT-PCR negative COVID-19 pneumonia: Review and recommendations. J Family Med Prim Care. 2021;10(5):1814-7.

186. Yee JM, Moran S, Chapman T. From Beginning to End: A Single Radiology Residency Program's Experience with Web-Based Resident Recruitment during COVID-19 and a Review of the Literature. Acad Radiol. 2021;28(8):1159-68.

187. Abraham P, Bishay AE, Farah I, Williams E, Tamayo-Murillo D, Newton IG. Reducing Health Disparities in Radiology Through

Social Determinants of Health: Lessons From the COVID-19 Pandemic. Acad Radiol. 2021;28(7):903-10.

188. Messina MD, Stein MW, Armstrong IJ, Wolf EL. Impact of the COVID-19 pandemic on radiology department emergency ultrasound utilization. Emerg Radiol. 2021;28(5):869-75.

189. Alhasan AS, Alahmadi SM, Altayeb YA, Daqqaq TS. Impact of COVID-19 Pandemic on Training and Well-Being in Radiology Residency: A National Survey of Diagnostic Radiology Trainees in Saudi Arabia. Acad Radiol. 2021;28(7):1002-9.

190. Ahuja G, Verma M, Patkar D. Financial impact of COVID-19 on radiology practice in India. Indian J Radiol Imaging. 2021;31(Suppl 1):S31-s7.

191. Garg T, Desai A, Gala K, Warawdekar G, Tavri S. Interventional radiology preparedness during coronavirus disease (COVID-19) pandemic. Indian J Radiol Imaging. 2021;31(Suppl 1):S21-s30.

192. Zeydi AE, Ghazanfari MJ, Sanandaj FS, Panahi R, Mortazavi H, Karimifar K, et al. Coronavirus Disease 2019 (COVID-19): A Literature Review from a Nursing Perspective. Biomedicine (Taipei). 2021;11(3):5-14.

193. Wenbin H, Yan Y, Bilong F, Jing D, Sisi L, Min Y, et al. Nursing Management of Adult Ostomy Patients During the COVID-19 Pandemic. Inquiry. 2022;59:469580211072440.

194. Smith SJ, Farra SL. The Impact of Covid-19 on the Regulation of Nursing Practice and Education. Teach Learn Nurs. 2022.

195. Majrashi A, Khalil A, Nagshabandi EA, Majrashi A. Stressors and Coping Strategies among Nursing Students during the COVID-19 Pandemic: Scoping Review. Nurs Rep. 2021;11(2):444-59.

196. Shiner D, Bock B, Simpson C, Skorupski T. Nursing Strategies to Safeguard COVID-19 Patients From Harm in the Intensive Care Unit. Crit Care Nurs Q. 2022;45(1):13-21.

197. Avilar CTA, Andrade Í MA, Nascimento C, Viana LVM, Amaral TLM, Prado PRD. Nursing care for bed bath in patients with COVID-19: an integrative review. Rev Bras Enferm. 2021;75Suppl 1(Suppl 1):e20200704.

198. Komariah M, Maulana S, Platini H, Pahria T. A Scoping Review of Telenursing's Potential as a Nursing Care Delivery Model in Lung

Cancer During the COVID-19 Pandemic. J Multidiscip Healthc. 2021;14:3083-92.

199. Hao X, Peng X, Ding X, Qin Y, Lv M, Li J, et al. Application of digital education in undergraduate nursing and medical interns during the COVID-19 pandemic: A systematic review. Nurse Educ Today. 2022;108:105183.

200. Mulyadi M, Tonapa SI, Luneto S, Lin WT, Lee BO. Prevalence of mental health problems and sleep disturbances in nursing students during the COVID-19 pandemic: A systematic review and meta-analysis. Nurse Educ Pract. 2021;57:103228.

201. Palacios-Ceña D, Fernández-Peña R, Ortega-López A, Fernández-Feito A, Bautista-Villaécija O, Rodrigo-Pedrosa O, et al. Long-Term Care Facilities and Nursing Homes during the

First Wave of the COVID-19 Pandemic: A Scoping Review of the Perspectives of Professionals, Families and Residents. Int J Environ Res Public Health. 2021;18.(19)

202. Huang CL. [Impact of Nurse Practitioners and Nursing Education on COVID-19 Pandemics: Innovative Strategies of Authentic Technology-Integrated Clinical Simulation]. Hu Li Za Zhi. 2021;68(5):4-6.

Proof