Jagannath University Research Journal (JURJ) Volume No.-I, Issue No.–II, November, 2020, ISSN: 2582-6263

Strategies to Sustain Healthcare Practices During and Post-COVID Era

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Abstract: The novel Coronavirus 2019 (COVID-19) has changed the landscape of the healthcare system. As it is known to spread by human-to-human transmission, precautionary measures mainly include social distancing. For this purpose, hospitals and clinics have tried to postpone elective and non-critical interventions. However, based on the uncertainty of the situation, it is not possible to postpone interventions indefinitely. Institutions are coming up with sustainable strategies to continue healthcare practices during and after the COVID era. This paper summarizes the key strategies that will help in sustaining healthcare practices in various fields of medicine.

Keywords: COVID-19, Healthcare, Sustainable practices

I. INTRODUCTION

The novel Coronavirus 2019 (COVID-19) was first reported in December 2019. It was announced as the sixth public health emergency requiring worldwide attention by WHO in January 2020. It is reported to spread by human-to-human transmission[1]. The transmission routes include direct transmission, such as cough, sneeze, droplet inhalation transmission, and contact transmission, such as the contact with oral, nasal, and eye mucous membranes. It can also be transmitted through the saliva, and the fecaloral routes.

Since its announcement, communities have adopted mitigation strategies that have rarely been used before. All the healthcare systems have been trying to adapt to the new situation, and various preliminary guidelines have been published.

Most strategies are based on reducing public contact and maintaining social distancing. In the healthcare practice, elective interventions have been postponed to give care to patients with COVID-19. However, patients who need emergency healthcare support should not be neglected. This should be done without compromising the safety of healthcare providers. To maintain the sustainability of the healthcare system, the protection of healthcare providers should be the top priority.

The continuing rise of COVID-19 cases [1]points towards the need of establishing guidelines for re-enforcing healthcare practices and developing sustainable strategies for continuation of healthcare services during and post COVID era.

This paper summarizes the challenged faced by the healthcare system and the strategies implemented in various fields of healthcare to ensure sustainability of the practices keeping in mind the safety measures essential for protection of the healthcare providers.

II. CHALLENGES AFFECTING MEDICAL PRACTICE

Controlling cross-infection

Corona viruses can survive up to 96 hours in biological fluids, and in high relative humidity and low temperature. Contamination of surfaces plays a major role in transmission of the viruses. In most of the medical fields, non-disposable equipments are repeatedly used in multiple patients. Such equipment can get contaminated by the virus when they come in contact with patients with COVID-19. If the equipments are not efficiently disinfected prior to use in the other patients, it imposes a high risk of cross-contamination to all the patients2.

Outpatient care

During this outbreak, patients tend to postpone follow-up visits to hospitals and clinics to avoid the risk of infection. However, the uncertainty of the outbreak leads to a difficulty in selecting the next appointment date. Such delay in follow-up for patients with glaucoma, hypertension, or diabetes predisposes them to life-threatening complications.

Inpatient care

Movement of patients from one ward to other imposes significant risk of cross-contamination. They not only impart a risk to other patients but also to the healthcare providers.

Surgical practice

Surgical procedures involve use of various non-disposable instruments. This serve as a means for cross-infection between surgical patients from different wards, as well as between patients and healthcare workers from different departments.

Safety of healthcare providers

Healthcare providers who have to work in close proximity of patients' nose, mouth, or eyes face a significant risk of being infected by the virus. They are also subject to risk of getting infected by contaminated surfaces. As they play a significant role in providing medical care to patients with and without COVID-19, it is pivotal to ensure safety of these workers.

Sustainable practice guidelines

To ensure a balance between providing medical care to patients and ensuring the safety of healthcare providers, some guidelines that have been used across various institutions are summarized below. Figure summarizes the strategies common to all fields of medicine. These are not limited to the COVID era, but also need to be sustained in the post COVID era as precautionary measures against other infections.

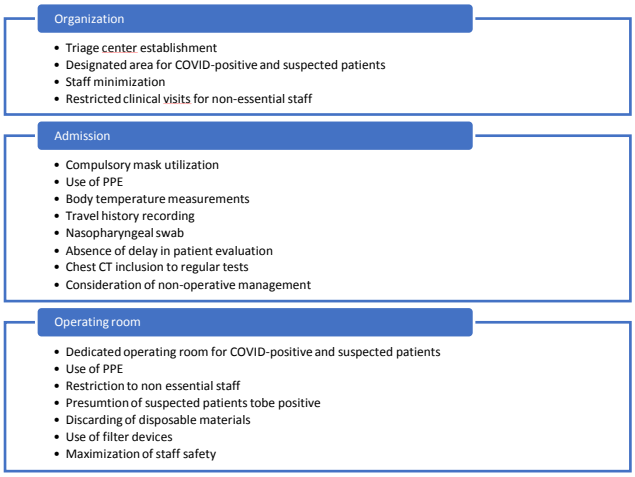

Figure. Sustainable strategies in healthcare sector during and post COVID era[3].

CT, Computed tomography; PPE, Personal protective equipment

Dental clinics

Owing to the peculiarity of the dental practices, there is face-to-face communication and exposure to saliva, blood, and other body fluids between the dental specialist and the patients. Additionally, non-disposable sharp instruments are used that come in contact with the patient's body fluids. This imposes an elevated risk of cross-contamination between the dental specialists and patients. Hence effective measures for infection control are needed in the dental clinics.

The sustainable strategies to block virus transmission during the COVID-19 era and prevent such events in the post COVID-19 era include patient evaluation, maintaining hand hygiene, personal protective measures for the dental professionals, mouth rinse before dental procedures, rubber dam isolation, anti-retraction handpiece, disinfection of the clinic settings, and management of medical waste4.

Endoscopy

Endoscopy is the insertion of a long, thin tube directly into the body to observe an internal organ or tissue in detail. It can also be used to carry out other tasks including imaging and minor surgery. Endoscopes are minimally invasive and can be inserted into the openings of the body such as the mouth or anus.

Although minimizing public contact is the key strategy to avoid COVID-19 transmission, it is not possible to delay urgent endoscopic procedures. As patients with COVID-19 are reported to present gastrointestinal manifestations of the disease, all endoscopic procedures should be considered as high risk.

For the patients with COVID-19, an alternative method to endoscopy, such as transhepatic drainage of the biliary tract, must be considered, whenever possible. When there is no alternative to performing endoscopy, full personal protective equipment (PPE) must be used and the procedure must be conducted in a designated endoscopy room3.

Lacrimal practices

The lacrimal apparatus is the physiological system containing the orbital structures for tear production and drainage. It consists of the lacrimal gland, which secretes the tears, and its excretory ducts, which convey the fluid to the surface of the human eye.

As lacrimal fluid can be a vector for transmission of COVID-19 infection, any procedures associated with the lacrimal system must be conducted in accordance with guidelines for controlling COVID-19 transmission. The strategies for sustainable lacrimal practice are classified into 7 subtypes. The screening and triage strategy, the testing strategy, the personal protection strategy, the lacrimal clinics and operating room strategy, the telemedicine strategy, the education and research strategy, and the psychosocial strategy 5.

Oncology: Radiotherapy for lung cancer

The pandemic mitigation strategies including reduction of elective services, focus on remote visits, and use of PPE that apply to general medical care also apply to oncology in particular. However, oncology medicine faces higher challenges in coping up with COVID-19 situation. The patients with cancer represent the highest risk groups, and have risk of death from both, the virus and cancer itself. Radiation therapy is used for treatment of lung and other forms of cancer. It is even more challenging for radiation oncologists to continue with accepted guidelines due to the high risk imposed in such patients.

The recommendations for risk-mitigation pandemic scenario include not compromising the prognosis of lung cancer patients by departing from guideline-recommended radiotherapy practice, postponement or interruption of radiotherapy of COVID-19 positive patients, and considering the following factors for patient triage: potential for cure, relative benefit of radiation, life expectancy, and performance status6.

Ophthalmology

Ophthalmic equipment, if contaminated with tears or conjunctival secretions of patients infected with COVID-19, can infect other patients that come in contact with them. Regular disinfection of all equipment and instruments with appropriate cleansing agents is recommended. Some of the antiseptics-disinfectants for human corona viruses are povidone-iodine or combination of chlorhexidine with ethanol and cetrimide2. The use of air puff to measure intraocular pressure should be avoided to prevent the generation of aerosols from infected conjunctival secretions that risk transmission to healthcare workers.

Screening methods to categorize patients based on COVID-19 status are helpful. Screening methods may include temperature monitoring, evaluating travel history, contact with an infected person, and acute respiratory infection. Based on the status of the parameters, patients can be given or restricted entry in the clinic or hospital2.

Use of PPE is recommended by the WHO and the Centers for Disease Control and Prevention. Additional precautions for all staff include surgical masks in all clinical areas, mitigating the risk of inadvertent exposure of a health care worker to an unidentified COVID-19 patient2.

For high-risk patients, full PPE must be worn at all times by all involved healthcare workers. Single-use equipment such as eye drops can be used to reduce the risk of transmission to the next patient. Non-disposable equipment must be sufficiently disinfected. Separating inpatient and outpatient ophthalmology care will reduce the risk of cross-infection2.

Orthopaedics

As most of the non-critical elective surgical procedures are being postponed, orthopaedic practitioners have to consider resuming normal procedures by consenting patients who were cancelled for elective total joint arthroplasty operations if they want to reschedule immediately, cancel, or wait 3 to 6 months. When orthopaedic practices understand demand for elective total joint arthroplasty services, they can plan for efficient utilization of surgical facilities, which will be critical to economic recovery and sustainability.

It is recommended to designate operating room availability by division instead of by surgeon, with urgent procedures prioritized. Hospital systems may shift elective orthopaedic surgery procedures to non-COVID or COVID-light facilities for patient comfort, safety, and peace of mind. As orthopaedic surgeons restart their elective practices early discharge and outpatient total joint arthroplasty must be encouraged.

Orthopaedic groups and health care systems should look to technology and innovation during this transitional period to help sustain high-quality care in a cost-effective manner. Orthopaedic practices and health care systems should also assess the possibility of renegotiating terms on office space and imaging equipment (e.g. MRI, CT) with the aim of reducing overhead expenditures 7.

Respiratory

Nebulizers convert liquids into aerosols. Research has shown that COVID-19 remains viable in aerosols for up to 3 hours post aerosolization, thus increasing the probability of aerosol transmission. Secondary inhalation during aerosol dispersal may be possible.

The sustainable strategies that can be used in the respiratory field are as follows:

- Infection control by deprescribing nebulized therapies on medical wards and intensive care units.
- Minimization of nebulized unproven therapies (n-acetylcysteine, hypertonic saline).
- Using alternative bronchodilator formulations (oral β-2 agonist, recognizing its slower onset) before prescribing nebulized agents to patients who are uncooperative or unable to follow directions.
- Limiting nebulized drug utilization whenever possible.
- Using a viral filter to decrease the spread of infection.
- Adjusting procurement practices to address the transition from nebulized drugs to alternatives.
- Addition of a safety net to the drug-ordering process by restricting new orders for nebulized therapies to the prior authorization process.
- Nursing staff can track patients who received ≥ 1 nebulisations via open (before diagnosis) or closed systems so that staff wear suitable PPE to include a N-95 mask while cleaning the room [8].

Surgery

As mentioned earlier, some interventions cannot be delayed, such as trauma surgery, acute abdomen, and emergency endoscopies. Healthcare professionals should choose a treatment method appropriately in the circumstances to protect themselves and their patients as much as possible [3].

It is recommended to have a dedicated operating room for confirmed or suspected COVID-19 patients. All patients must be treated as presumed COVID-19 positive if they have symptoms/exposure history that warrants testing or are unable to provide information such as unconscious trauma patients.

The number of operating room staff should be minimized, and all additional personnel must be out of operating room. No unnecessary items should be brought into the operating theatre. Disposable caps and shoe covers should be worn and discarded after each case. Only the materials necessary for the case should be within the room. Electrocautery of blood, gastrointestinal tissue, and any of the body fluids may generate an aerosol. Emergency operation on COVID-19 positive patients should be treated as aerosol-generating procedures throughout the operative period (including intubation). Such cases should be performed with airborne precautions (N95 with face shield) and preferably in a negative pressure room. All staff in the operating theatre must use N95 or FFP2/FFP3 respirator, face mask, gown, gloves, hair cover, and shoe covers or plastic boots. If there is no suspicion of COVID-19, gowns may not be necessary for PPE saving, but droplet precautions must be taken. The use of devices to filter released CO2 for aerosolized particles is strongly recommended for laparoscopic procedures. An appropriate surgical approach should be chosen to minimize the duration of surgery and maximize safety for both patients and healthcare staff [3].

Non-emergency elective cases can be postponed to reduce potential infection risks to both patients and healthcare workers. For patients who need surgery, use of PPE with the N95 mask is a must for all operating staff. Protective eyewear such as visor masks has proven to reduce the risk of infection [2].

III. CONCLUSION

Measures have been taken to avoid cross-contamination among patients by postponing elective procedures, providing early discharge, and minimization of staff. However, uncertainty of the situation demands implications of sustainable practices in healthcare that will ensure safety of healthcare providers and enable providing sufficient medical care to the patients. Strategies and recommendations are being implemented at various institutions. There is a need for global guidelines to overcome the current scenario and prevent such situations in the future.

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