



Short Communication:

COVID-19: Role of dental nurse in the management of patients in the dental operator

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Abstract

The recent outbreak of coronavirus created a massive impact on the healthcare profession. The especially dental community has been focused more on by various researchers. The role of the dental nurse in a dental operator was also crucial. Unlike other health care professions, the dental nurse role is very imperative in the dental operator. Hence, the purpose of the present short communication was to discuss the role of dental nurses in dental operator, discussion on established guidelines and opinions of dental nurses.

Keywords: COVID-19, dental nurse, dentistry

The COVID-19 pandemic had significantly disrupted the healthcare profession. As airborne transmission is the primary mode of transmission, treatments in the dental operator have become very challenging. Most of the dental procedures are aerosol-generating procedures (AGPs). There are many enigmas around managing patients in the dental operator because most dental procedures are aerosol generated.^[1] There are higher chances of exposure to blood and saliva aerosols. Coronavirus has a half-life of approximately 1.1 to 1.2 hours and can persist up to 3 hours in the aerosols.^[2] The posterior oropharyngeal saliva samples were positive with viral load in COVID-19 positive patients^[3] the dentist, dental nurse, front-end receptionist, lab technician, and other dental staff are at risk in a dental operator. Dental nurses play a vital role in successful dental practice. They assist the dentist and work closely with patients to ensure that the appointment, treatment, and discharge smoothly.^[4] So far, the existing literature and guidance from health authorities only focused on suggesting guidelines to oral health care professionals for safe dental practice. Dental nurses also have an equally important role in managing patients in the dental operator. Dental nurses, as frontline workers, along with the dentist, provide the utmost care, and they also have equal importance in managing patients in the dental operator.^[5] Henceforth, there is a need to establish dental nurses' recommendations to address dental operator patients.

Guidelines:

Following the COVID-19 period, it is essential to follow stringent infection protocols given by local health authorities and treatment strategies to avoid transmitting this vulnerable disease from affected and asymptomatic patients. According to the American Dental Association (ADA)^[6], dentists prioritize their practice to emergency procedures. The occupational safety and health administration (OSHA)^[7] have issued guidelines based on the category of the procedures and their potential risk to healthcare professionals as follows:

Risk categories, according to OSHA:

Low: Treatment performed away from staff members.

Medium: Emergency care that does not involve aerosol generation.

High: Procedures performed in a suspected COVID-19 patient or that involves aerosols generation.

Very High: Procedures that involve aerosol generation in known COVID-19 patients.

Recommendations:

The recommendation is to consult the patient through tele dentistry for most of the cases. If the treatment is deemed as an emergency, standard OSHA recommendations are to be considered. Nurses and other staff should know the guidelines and measures to be followed.^[7]

Follow standard treatment protocols:

1. Personal protective equipment (PPE): Gloves, masks, eyewear, lab coat, and scrub.
2. Waste Disposal: Standard disinfection measures for pathological material, biohazard, and general waste.
3. Equipment: High volume suction evacuators, low-speed hand piece, rubber dam isolation for procedures leading to the aerosol generation.
4. Dental Operator Design: Front area reception should be isolated with a glass or plastic barrier. Chairs in the waiting room should be placed 6 feet apart.

Triage

Dental nurses should follow the guidelines while performing triage on call and in the office.^[8] Owing to the varied incubation period of COVID-19, the patient might not develop signs and symptoms when asked remotely. During on-call triage, it was recommended to prescribe antimicrobial mouth rinses.^[9] If a patient reports recent travel history to COVID-19 epidemic areas, it is better to postpone the treatment for 14days. A quick check for body temperature, dry coughs, sneezing, and trouble in breathing was suggested. Hence, dental nurses should take necessary precautions while performing triage in the office. A complete set of questionnaires should be evaluated to confirm the patient health details before performing the treatment. It is highly recommended to avoid scheduling multiple patients in a day. Appropriate measures to maintain social distancing include at least a meter distance between patient chairs at the reception area.^[8] Dental triage on-call to check for the priority of treatment.

1. Demographics of the patient include age, gender, and location.
2. A brief note of medical history mainly focuses on chronic diseases such as
3. Diabetes, heart diseases, and any immunocompromised conditions.

4. Past treatment history.
5. Question any recent history of fever, cough, and cold.
6. Recent history of travel to highly pandemic areas.
7. Current Medication status.
8. Explain the hazards and possible outcomes of treatment during the pandemic, total cost, and precautions.
9. Instruct the patient to use mouthwashes on a regular basis.

Treatment Measures

On the appointment day, a dental nurse must perform the patient's temperature measurement and COVID-19 screening. It is imperative to follow minimal invasive treatment or atraumatic restorative procedures to reduce aerosols' generation. ^[10] During ultrasonic scaling, aerosols can spread to about 4 feet from the chair. A quick rinse with 1% hydrogen peroxide or 0.2% povidone is helpful to reduce the viral load. ^[11] It actively reduces the oral cavity's microbial load as the oral mucosa has the ACE2 host cell receptor for coronavirus. Rubber dams and high vacuum evacuators limit aerosols' spread while performing dental procedures. ^[12] The dental chair and possible surfaces must be covered with plastic. ^[13]

A dental nurse is expected to be proactive, focused, and well prepared with all the required materials to reduce the total time of dental treatment.

Hand hygiene

Peng et al ^[14] recommended hand washing 5 minutes, two times before and three after completion of the procedure to ensure the transmission is controlled. The World Health Organization (WHO) ^[15] recommends hand rubbing techniques with alcohol-based gel for about 60seconds.

Personal protective equipment (PPE)

This includes using fluid-resistant gowns; gloves, filtering face piece respirator (FFP3) or N95 masks, and appropriate eye protection to avoid viral transmission from aerosols and splatter in the dental operator (Figure I, <https://www.cdc.gov/coronavirus/2019-ncov/hcp/using-ppe.html>).^[16] The Emergency Nurse Association 2021 (ENA) considers bandanas, scarves, and cloth masks are not the best options.

The COVID-19 virus's size is approximately 120nm, and aerosols that arise in dental operator are 3 - 100nm. ^[17] The regular surgical masks used by dental

nurses and dentists are not practical barriers in these situations. An FFP3 respirator or N95 mask can filter particles of size 0.6 µm and offers 99% filtration efficiency for the treatment of COVID-19 positive cases, FFP3 respirator usage is mandatory.

The dental operator's dental nurse and frontline workers should be adequately trained using N95 respirators. The OSHA ^[7] recommends qualitative and quantitative tests to ensure the respirator is correctly worn. This allows the dental nurse to wear the mask or respirator properly, and adequate protection is provided.

The testing includes inhaling an irritant smoke or sensing a fragrance A qualitative test consists of a pass/fail to test an aerosol agent (Saccharin, Bitrex T M), and a quantitative test includes checking the fit with an instrument. The Centre of Disease Prevention Centre has proposed a PPE Burn rate calculator to assess PPE consumption in a healthcare facility ^[19]

Eyewear

Goggles, reusable face shields can be used for adequate eye protection. According to OSHA guidelines in the dental operator, recently powered air-purifying respirators or full-face respirators are recommended for dental professionals. ^[6]

The extended use of the same eye protection for multiple patients is not recommended, as it might increase infection spread. ^[19] The eye protection should be disposed of in cases of damage and difficulty to see through.

Gowns

Non-sterile disposable gowns are a perfect choice while treating COVID -19 affected patients. Surgical dresses can be worn during surgical procedures, but they do not provide complete protection as they can be open at the back. Coveralls are also a good option as they provide 360-degree protection covering the entire body. However, the disadvantage with Coveralls is that heat generation is high as compared with gowns. Gowns and coveralls that meet standards with EN 14126 and EN 13795 are recommended. ^[20] When dealing with procedures that involve contact with body fluids. The dental nurse should be adequately trained with PPE's stepwise disposal after the patient's discharge from the dental operator. ^[15]

Disinfection of dental operator

Human coronaviruses can survive on nonliving surfaces for nine days. ^[21] A effective and repeated cleaning of dental operator with disinfectants is critical. ^[16] These disinfectants include sodium

hypochlorite and ethanol before and after appointments to avoid transmission of COVID-19 disease.^[21] An effective method is disinfection with 70% ethanol for small surface disinfection.^[15] Disinfection of the floor of the operatory twice daily by 2000mg/L chlorinated solution.^[22] Chlorine dioxide solutions in various concentrations can be used as a mouth rinse for disinfection of impressions^[22] and dental unit waterlines (DUWL).^[23] Or dental operatory, that has closed enclosures without direct windows, devices with plasma cluster ion technology, UV lights and filters with High-Efficiency Particulate Air (HEPA) can reduce aerosols' formation.^[22]

Management strategies (4Cs) for dental nurses during COVID-19

Check-In: Patient records, PPEs, medical condition, equipment required for treatment (surgical/invasive procedures and radiographs) and reduce waiting time as much as possible.

Care: Facilitate treatment with a low level of risk.

Clean: Sterilize and disinfect the workspace, dispose of contaminated materials as per regulations.

Constructive communication: Maintain clear and concise communication with colleagues, patients, and lab personnel.

The significant steps to be followed by a dental nurse when a patient visits the dental clinic are listed stepwise in Figure II.

Tele-nursing

Tele-nursing refers to information technology to provide nursing services whenever physical distance exists between patient and nurse. The nursing training program's effectiveness using interactive tele-education is proven.^[24] Nurses will be specially trained to use and deduce technological devices that monitor the internal functioning and vital signs of a patient, and it would be strongly encouraged. Tele-education innovation can be utilized successfully by nursing instructors working in worldwide wellbeing as a feature of global learning shared.^[25] The need for remote care is gaining particular focus, especially during the COVID-19 pandemic. Nurses are expected to use digital technologies such as computers and telephones to consistently facilitate and evaluate the nursing care. It is could be a valuable aid, especially during dental emergencies. During an emergency crisis, nursing is critically required, especially in remote areas. Most applications include two-way video-audio conferences, messenger chats using smartphones.^[26] Tele-nursing will be a successful endeavor for dental education and counseling. A nurse

can follow up with the patient remotely regarding the treatment plan, complications, and other concerns that the patient might have post-treatment. This resolves the challenge of monitoring and compliance.^[26]

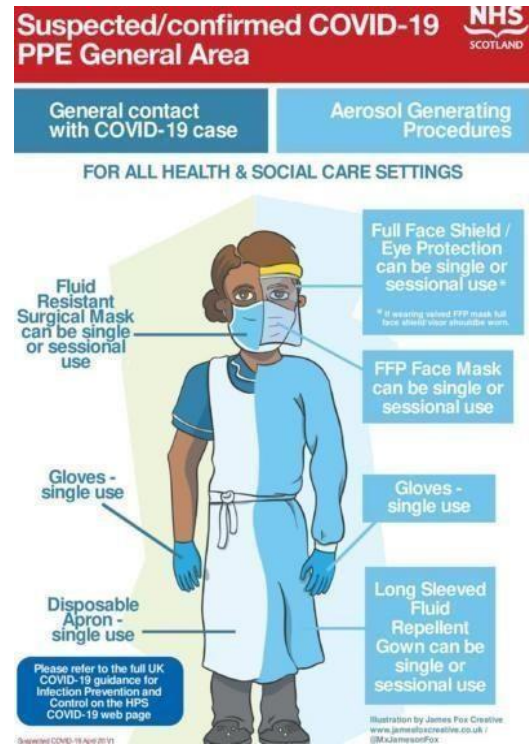


Figure 1. Public health England recommendations for removal (doffing) of personal protection equipment (<https://fabnhsstuff.net/fab-stuff/removing-ppe>).

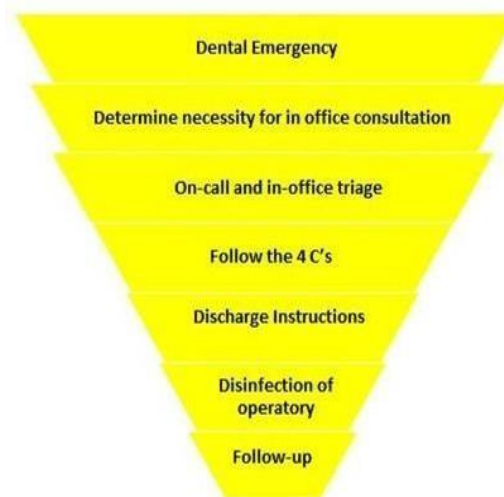


Figure 2. Flow chart depicts steps in managing the dental patient in the operatory.

Discussion

Dental practices and hospitals have become potential areas for COVID-19 disease transmission, and effective infection control protocols are essential for all dental teams. A dental nurse is an integral part of the dental team, ensuring that the patient receives the best and safe treatment by assisting the dentist in the operatory.^[27] The risk of cross-infection may be high due to the aerosols generated by dental procedures, various equipment and instruments, and dental settings.

The first report of three dental nurses being tested positive for COVID-19 was reported in January 2020 in the Wuhan University Dental Hospital and six more oral healthcare professionals from the same hospital by this virus.^[14] Along with dentists, dental nurses' role is also very crucial in managing patients in the operatory.

A dental nurse's duty includes scheduled appointments, managing the front office, keeping up with patient records (Medical records, Insurance details, radiographs, etc.), and assisting the dentist throughout the treatment, followed by a disinfection operatory. The roles may vary depending on the type of practice and patient population.^[5] As a dental nurse, it is essential to be friendly, efficient, calm, welcoming, and reassuring.

Assisting the dentist comprehends a wide range of procedures from fixing the appointments, arranging the required instruments and materials, and cleaning used instruments for sterilization. Additional responsibilities may include facilitating dentists with patients' information, stock control, and sometimes processing radiographs. Overall, the dental nurse works very closely with the dentist, from oral screening to dental treatment.^[28,29]

An experienced dental nurse will anticipate the dentist and patient's needs during treatment sessions, and the dentist will give this skill a high value.^[24] There is a great necessity to provide high importance to the mental health of a dental nurse.

The impact of trending news from social media and other health authorities on mortality rates on dental nurses' health and wellbeing has also been affected. Many factors, such as working in high-risk areas, fear of transmission to their family members, and anxiety, impact their overall wellbeing.

Telemedicine is becoming an essential measure of healthcare services in recent times globally. A key objective of telemedicine is to avoid the unnecessary traveling of patients and their accompanying persons. It was suggested that many healthcare organizations maintain social distance; hence telemedicine has a significant role in such pandemic situations.^[27]

The recommendation is to have regular group meetings with colleagues, spend time with their families, assessment of their needs personally and professionally. The concept of telenursing should be introduced in dentistry to avoid the contraction of infectious diseases such as COVID-19. Tele-nursing increases nurses' productivity as it prevents the chance of infection associated with in-office consultation, enhances patient safety and helps nurses in documentation promptly. This review presents important recommendations for dental nurses and is highly helpful in understanding the challenges and duties of dental nurses.

It is the only paper explaining the duties, strategies, and recommendations of nursing practice in dentistry. Dental nurses also have equal importance in managing patients in the dental operatory, and they are deemed to be at very high risk as equal as dentists. The present review illustrates dental nurses' challenges while operating in a dental clinic during and post COVID-19.

It also emphasizes understanding the responsibilities management strategies, and recommendations for the dental nurse's overall wellbeing and opinion from two dental nurses regarding the COVID-19 pandemic outbreak and precautions at dental operatory summarized in Figure 3.

<p>Working in a dental clinic setup is one of the risky jobs where front liners need to exert effort to prevent the spread of diseases or infection. Thorough disinfection and sterilization of instruments and machines to be used for every dental procedure. It became mandatory to implement the prevention of the proliferation of viruses in the clinic environment. Maintenance of cleanliness is vital in the clinic since we are dealing with patients with the problem of oral cavity or mouth area, where it can serve as a portal of exit of microorganism, especially when patients will sneeze or cough during the entire procedure. There are times when the material is scarce, especially the healthcare professionals' supplies used as Personal Protective Equipment (PPE). Thus we are doing ways to improvise materials to protect ourselves from the infection. Besides, having a strong immunity is necessary for safeguarding ourselves from acquiring the deadly virus.</p>	<p>2020 brought us too many challenges, and the most challenging one is the one we are still facing right now. COVID 19. Whoever thought this pandemic will happen this year and then give every front liners show how they truly love and care for their jobs. Not a showoff, but it challenges us to do our work with our utmost care. I am working on a clinic set up where patients come and go. To protect ourselves, PPE is being worn. Before they can enter the clinic, we have a protocol that patients need to be triaged asking about their health conditions if there are COVID-like symptoms. Once with COVID-like symptoms and they will be replaced in an isolation room. As we already know, we need to disinfect our workstation or our workplace every now and then. Hand washing and use of alcohol are required as always, plus having a strong immunity.</p>
 <p>Marlon Mercado Dental Nurse Majmaah University, College of Dentistry Kingdom of Saudi Arabia</p>	 <p>Jody Del Rosario R.N Avenues Medical Care CLINI Clark, Pampanga, Philippines</p>

Figure 3. Opinions of the dental nurses from the Kingdom of Saudi Arabia and the Philippines.

Conclusion

The present review illustrates a dental nurse's duties, management strategies, and recommendations from various health authorities regarding PPE, disinfection, and preventive measures to be adopted for their overall wellbeing. More research must understand their knowledge and perceptions as dental nurses are equally at high risk as dentists. Recommendations to understand the overall well-being should be emphasized.

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