

Research Article

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Current best practice recommendations for safe dental Practice in the COVID-19 era***Corresponding Authors: Gopi Battineni**

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Abstract

Methods: The researchers conducted a thorough review of the American Dental associations (ADA), Advisory Taskforce on Dental Practice Recovery, CDC (Centers for disease controls & Prevention, USA) guidelines for providing dental care during Covid-19 pandemic to protect the dental personal, OSHA's (Occupational safety and health administration, US Government agency) supplemental interim guidelines for dental workers and employers related to control and prevention of Covid-19 & the UK's National Health Services (NHS) proposed guidelines for standard operating procedures for urgent dental care during covid-19 pandemic.

Results: Systematically laid down and concisely presented infection control, administrative and engineering control guidelines from top international organizations. Step by step guidelines beginning from pre-appointment screening, in office registration process, chair-side protocols to staff protection protocols are presented. Special focus on aerosol/droplet/fomite generating procedures and prevention of infection through judicious use of PPE's and other novel disinfection techniques including administrative and engineering controls.

Conclusion: Covid-19 pandemic is a unique and once in a generation crisis for the practice of dentistry globally. Most dental professionals are limiting themselves to emergency treatments as per local guidelines. There is an urgent need to ensure state of the art and scientifically authentic guidelines are presented to the dental community to alleviate their anxiety so that they can begin to practice dentistry without the uncertainty and fear that Covid-19 has brought upon the dental fraternity.

Keywords: COVID-19; dental practice; CDC guidelines; viruses.

Introduction

In December 2019, Chinese authorities were notified by the local health officials in Wuhan, Central China that of unknown origin was been seen by health care workers of the city. The mysterious illness was linked to a seafood market in Wuhan selling live animals which indicated zoonotic origins of the disease and transmission from human to animals. This atypical pneumonia-like illness was named 2019-novel Coronavirus (2019-nCov) [1]. The Coronavirus study group of the international committee of the taxonomy of 202 classified and named

it as severe acute respiratory syndrome coronavirus-2 (SARS-COV-2), this is the name more commonly used by a health care professional around the world and has gained currency global and the popular media generally refers to the disease as the Novel Coronavirus or Coronavirus (Covid-19) [2]. Since the first reported case in Wuhan China in December 2017, the disease has spread to all corners of the world and on January 3, 2020, World Health Organization declared it as an emergency of international concern and on 11th March 2020 it was declared as a

pandemic by the foremost health authority in the world [3]. As of 15th June 2020, the total number of Covid-19 cases have surpassed 8 million people and the deadly virus has killed 433,000 people globally [4].

Coronaviruses are a special group of viruses that can cause several types of viral infections of differing degrees of severity. Coronaviruses first head the headlines with the 2004 Severe acute respiratory syndrome in China in 2004 and again in 2012 with the outbreak of the Middle East respiratory syndrome (MERS) in 2012 which took place in Saudi Arabia [5]. Coronaviruses are enveloped viruses with a single strand, they are non-segmented and have a positive-sense Rna genome, and it can be transmitted from person to person. Coronaviruses infect a variety of animals including bats and pangolins. Bats and pangolins are generally considered to be the chief candidates responsible for the current Covid-19 pandemic [6,7]. Studies have shown that there are two chief mechanisms of transmission of Covid-19, the direct method is person to person (contact or touch transmission or inhalation of respiratory droplets) and airborne or fomite mediated transmission which is considered indirect transmission [8,9].

The most commonly observed, reported and cited clinical symptoms of Covid-19 are fever, dry cough, breathing difficulties (Dyspnea) and malaise [10]. CT scan observations observed pneumonia with anomalous observations in most cases. Diarrhoea, sore throat, sputum and cephalgia have also been observed in some patients along with a loss of sense of smell and taste in few reported cases [11,12].

The Coronavirus (Covid-19) pandemic poses the biggest challenge profession of dentistry has faced in recent history. The risk of contagion due to human-to-human contact is one of the highest in the profession of dentistry, not only due to the proximity of patient-dentist interaction but also due to the manual dexterity required in working in such a small and enclosed space like the oral cavity with rotary instruments. Apart from that, the risk from a droplet, fomite, aerosol and contact transmission only adds to the complexity of practising dentistry in the era of Covid-19 [13-15]. Many global organizations and bodies have come out with updated recommendations and guidelines for dentists and the dental workforce to protect the dental workforce and patients from the risk of contagion. The subsequent section will present infection control, administrative engineering and screening guidelines for the dental practice by international bodies/organizations to aid the dentist in securing their practice for their team, patients and the wider community.

Dentist practices during Covid-19 Pandemic

The ADA's Advisory Taskforce on Dental Practice Recovery has developed a toolkit to provide interim guidance for re-organizing dental clinics/hospitals/practice instead of Coronavirus outbreak, as some States move to reopen for elective dental treatment [16].

Pre-appointment screening process: Recommends two-phase (telephone followed by in-clinic) pre-appointment screening to identify suspected covid-19 patients, and susceptible individuals with cardiovascular disease, respiratory disease, renal disease, diabetes mellitus, or other immune disorders. Remind patients to limit extra companion. A positive response

to any question in the questionnaire requires discussion with the dentist before any elective procedure. Where suitable, the patient should wait in their car, until called to enter the practice. The patient should bring their pen or supplied one to take home to reduce/eliminate shared objects in the practice.

In-office registration process: Provide hand sanitiser, and document temperature (< 100.4 F) using a non-contact thermometer. If the temperature is high, supply mask and donning instruction, alert the dentist. Chairs should be placed 6 feet apart in the waiting area, screen barriers should be used where possible. Remove shared objects from the waiting area. Regularly wipe and disinfect touched surface between patients using EPA recommended disinfectant against SARS-CoV. The patient should be reminded to report any signs and symptoms of Covid-19 within the next 14 days.

Chairside protocols: Revise informed consent, limit paperwork in the operatory, cover frequently touched surfaces with a protective barrier. Supply mask and shield to anyone accompanying the patient. No evidence exists for a pre-procedural mouth rinse. The treatment plan should be based on patient health, risk factors, and geographic incidence of Covid-19. Procedural requirements and clinical risks should be assessed by the provider's clinical judgement (aerosol-generating procedure vs use of rubber dam, availability of PPE vs the risk of treatment). Aerosol generating procedures should be reduced (use of hand scaler, High-velocity evacuation where possible). Use disposable nasal hood and tube for nitrous oxide. Shock dental unit waterlines, if not used for an extended period. Remove mask outside the treatment room, if soiled or damaged, it must be replaced. Clean operatory while wearing PPE. All patients are infections, therefore use the highest level of FFP (level 3) along with goggles or face shields available to minimize risk during treatment.

Staff protection protocols: Front desk staff should be provided with masks and goggles, or face shields, or clear barrier. Use of individual headsets for each front desk staff to prevent the spread of the virus through contact. Two-before-and-three-after hand hygiene practice. Disposable gowns must be disposed of; cloth gown should be washed after each use. Change between scrubs and street clothes upon entry and exit, provide laundry facility in the office. Use professional judgment about the use of the head and shoe cover. Health screening checkpoints must be created and a log for all staff members should be kept and updated daily, it should document temperature, cough, and shortness of breath.

Dental care guidelines

Centres for disease control and prevention (CDC) guidelines

CDC guidelines for providing dental care during the Covid-19 pandemic to protect the dental personal [17].

- ✓ Reschedule/delay elective treatment, procedures, surgeries and non-essential dental appointments, and schedule only emergency and urgent dental services.
- ✓ Educate staff on donning, doffing, reusing, and decontaminating PPE
- ✓ Monitor dental health care providers regularly before

shifting for symptoms of covid-19 and document temperature.

✓ *Urgent dental care for known/suspected cases of Covid-19:*

- Telephone triage and screening for all patients to determine the need for urgent dental care and symptoms of respiratory illness. Delay emergency dental care for patients with positive symptoms until recovered.

- Teleconferencing/Tele-dentistry for pharmacologic management of pain.

- Require face mask/cloth face covering for everyone entering a dental facility to address asymptomatic or pre-symptomatic transmission.

- Upon arrival reassess patient at check-in, document temperature (<100.4 F) and if the patient is suspected/confirmed case of covid-19: defer dental treatment, provide mask, and instruct to call medical provider or refer to a medical facility if acutely sick.

- *Engineering controls:* avoid aerosol-generating procedures, if required use four-handed dentistry, high evacuation suction, use a rubber dam, and no visitors during the procedure if possible.

- *Infection control considerations:* Dental Health Care Providers (DHCP) should always wear surgical or respirator mask while in the dental setting, hand hygiene before and after wearing a mask.

✓ *PPE during dental care (discard disposable PPE if become soiled or disinfect if reusable):*

- *Before entering treatment area:* N95 respirator or higher (If N95 respirator is not available surgical mask with full face shield), eye protection, gowns, gloves.

- *During aerosol-generating procedures:* N95/ higher, eye protection, gowns, gloves.

✓ *Hand hygiene:* before and after contact with patient and bodily fluids, donning and doffing of PPE using 60 -95% Alcohol-Base Hand Rub (ABHR).

✓ *Disinfection of facility:* Use cleaners before applying EPA approved hospital-grade disinfectant against SARS-Cov-2 for frequently touched surfaces.

✓ *Treatment of patients after isolation:*

- *Test-based:* Resolution of sign and symptoms AND negative results for FDA Emergency Use Authorized molecular assay for Covid-19 from two consecutive upper respiratory swab specimen collected \geq 24 hours apart. OR 10 days have passed after the first positive test and no subsequent illness.

- *Non-test based:* at least 72 hours (3 days) have passed after resolution of sign and symptoms AND 10 days have passed since symptoms first appeared.

✓ *Urgent dental care for confirmed cases of Covid-19:*

- Separate well-ventilated triage area.

- Private rooms with a closed door and private bathroom.

- Airborne Infection Isolation Rooms (AIIRs) for aerosol-generating procedures.

- N95 or higher respirator, eye protection, gloves, gown. Limit the number of healthcare professionals during the procedure.

Occupational safety and health administration (OSHA) guidelines

OSHA has provided supplemental interim guidelines for dental workers and employers related to the control and prevention of Covid-19 [18].

✓ *Dental work tasks associated with exposure level:*

- Low occupational exposure risk when performing an administrative dental task in a secluded area of the dental establishment, and away from other members of the dental team & patients.

- Medium occupational exposure risk when providing emergency dental care, which does not involve aerosol-generating procedures.

- High occupational exposure when providing emergency dental care, which doesn't involve aerosol-generating procedures to suspected/positive cases of coronavirus, or entering covid-19 patient's room, or performing aerosol-generating procedures on healthy patients.

- Very high occupational exposure risk when performing the aerosol-generating procedure on known/suspected case of covid-19 or handling bodily fluids from known/suspected case of covid-19.

✓ In addition to standard precautions, OSHA recommends contact precaution, droplet precaution, and eye protection for non-aerosol generating dental procedures on healthy patients.

✓ For aerosol-generating procedures on suspected/positive cases standard precaution, contact precaution, airborne precaution, and eye protection have been suggested.

✓ Employers are responsible for providing their staff with adequate personal protective equipment to prevent occupational exposure from respiratory droplets as per OSHA requirements.

✓ In line with CDC recommendation, all optional dental visits should be postponed.

✓ *Engineering controls* Barrier/partition between treatment areas; Ventilation/exhaust to remove aerosols; Directional airflow using fans to move air away from staff work areas.

✓ *Administrative controls:* telephone triage, teledentistry, minimize aerosol-generating procedures, and some personnel entering treatment area, train and retrain workers to follow infection control protocols.

✓ Use of ultrasonic instrument is not recommended during this time. Prioritize the use of hand instruments with minimally invasive restorative procedures.

✓ *PPE for good patients:* gown, gloves, eye protection, surgical mask (non-aerosol generating procedures) or fit-tested NIOSH-certified N95 or better (aerosol-generating procedures).

✓ *PPE for suspected/confirmed covid-19 patients:* gloves, gown, eye protection, and fit-tested NIOSH-certified N95 or better.

✓ Routine disinfection of operatory and waiting area be-

tween patients using EPA approved disinfectant against coronaviruses.

National health services (NHS) guidelines

The United Kingdom National Health Services (NHS) has proposed guidelines for standard operating procedures for urgent dental care during covid-19 pandemic [19]. As part of this provision, all elective dental procedures including orthodontics has been stopped until further notice.

✓ Two major pathways discussed for the delivery of urgent dental care: *Remote management; and Face-to-face management.*

✓ Remote management

▪ Telephone triage and risk assessment questionnaire to identify suspected/confirmed Covid-19 patients, those at increased risk of severe illness (> 70 years, pregnant, those who qualify for flu jab), and shielded patients (those at highest risk for getting severe illness, individuals with underlying chronic medical conditions who are advised to shield themselves at home for 12 weeks).

▪ Advice, Analgesia, Antimicrobial (AAA) where appropriate.

▪ Refer when necessary, to designated face to face urgent dental care.

✓ Face-to-face management

▪ Educate dental team for local and national standard operating procedures and infection control protocols under covid-19 guidelines.

▪ Regular risk assessment for staff.

▪ Repeat dental triage and risk assessment for a patient to identify any changes.

▪ Advice, Analgesia, Antimicrobial (AAA) where appropriate.

▪ Treatment room protocols: Assemble equipment in the treatment room before surgery, avoid aerosol-generating procedures where possible, use high-power suction and rubber dam for aerosol-generating procedures, all treatment should be completed in one visit.

▪ Social distancing: physical (separate waiting and treatment area), and temporal (spaced appointment) based on patient risk assessment through a questionnaire.

▪ Limit number of people accompanying the patient during the visit (one escort per patient).

▪ The patient should wait in the car where possible until called. Upon entrance should be provided with sanitiser or soap.

▪ Avoid the use of 3-in-1 syringes, ultrasonic scaler to preserve the FFP level 3 mask.

▪ FFP3 should be removed outside the treatment room.

✓ *PPE protocols for face-to-face management in urgent dental care settings:*

▪ *Waiting/reception area:* Hand hygiene, fluid-resistant surgical masks.

▪ *Non-aerosol generating dental treatment area (contact and droplet precaution):* hand hygiene, gloves, plastic apron, fluid-resistant surgical mask, eye protection.

▪ *Aerosol generating dental treatment area (contact, droplet, and airborne precaution):* hand hygiene, gloves, fluid-resistant long-sleeved gowns, fluid-resistant FFP level 3 or face shield with non-fluid resistant FFP level 3, eye protection.

✓ Infection control protocols

▪ In addition to standard infection control procedures follow robust covid-19 infection control procedures provided by the regulatory authority with approved disinfectants.

▪ The treatment room should be left vacant for 20 minutes in a negative pressure isolation room or 60 minutes in a regular pressure with doors closed before disinfection. Natural ventilation by opening windows should be utilized if the room needs to be reused earlier than 60 minutes.

▪ Contact precaution, droplet precaution, airborne precaution.

▪ Respiratory hygiene for staff and patients (cover nose and mouth when sneezing coughing or blowing nose – ‘Catch it, bin it, kill it.

▪ One staff member with a patient with doors shut.

▪ Follow best practice approach for hand hygiene, and donning/doffing of PPE provided by NHS.

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Conclusion

These are testing times for almost everyone and dentists and the dental workforce are no exception. The dental workforce which includes everyone working in the dental chair-side and non-chair-side staff should support each other in these testing times. Dental researchers also must present state of the art and current infection control/administrative/engineering guidelines to the dental workforce to alleviate their anxieties and fears regarding the Coronavirus and ensure best practice and evidence-based measures are being employed by a dentist to protect the dental team from the patients. The dental workforce should stand united as a professional family, reduce elective procedure and restrict patient contact where possible. Aerosol generating procedures should also be avoided and the dental team should equip itself with the best PPE material available.

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