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The New Normal In Post Covid-19 Dental Practice: A Literature Review.

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ABSTACT

The COVID-19 pandemic, brought about by COVID (SARS-Co-V-2), has cause significant disturbance in the lives of dental groups the whole way across the globe. Coronavirus has spread quickly since it was first recognized in Wuhan and has indicated wide range of seriousness. Taking a gander at the current circumstance, it is obvious that the dental specialist ought to adjust to the current circumstance and keep offering support to patients by following appropriate conventions. By the by, there is a critical need to audit and modify our practice of contamination conventions that will forestall nosocomial spread of contamination during COVID 19 episode and future respiratory sickness. The infection has a transcendently respiratory transmission through aerosol concentrates and droplets. Up close and personal correspondence and reliable introduction to body liquids, for example, blood and saliva, dental considerate labourers at genuine danger of disease. This article quickly sums up the transmission of the infection in dental set up, spit as the transmission method of the contamination and the changes needed in the dental set up to keep offering dental types of assistance to public during this pandemic.

Keywords: Aerosols, COVID: 19, dentistry, SARS-CoV-2, transmission, virus

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INTRODUCTION

In December 2019, an episode of pneumonia because of obscure reason happened in Wuhan, China [1]. On January 30, 2020, the WHO proclaimed the COVID-19 flare-up as the 6th general wellbeing crisis of worldwide concerns; accordingly, this flare-up establishes a general wellbeing hazard through the global spread of sickness and requires an organized global reaction. The COVID 19 can present as an asymptomatic state, intense respiratory sickness and pneumonia [2]

The middle incubation time frame is 4 days (interquartile run - 2 to 7). Studies uncover that among the general influenced people, most influenced are the ones with existing comorbidity [3]

Current perception propose that individuals of any age are helpless to this new irresistible virus. The individuals who are in close contact with patients with suggestive and asymptomatic COVID-19, including medical care workers and different patients in the clinic are at a higher danger of SARS-CoV-2 infection [4]. Majority of patients experience fever and dry cough, while some had shortness of breath, fatigue, and other atypical manifestations, for example, myalgia, headache, sore throat, looseness of the bowel. Among patients who went through chest tomography (CT), most indicated reciprocal pneumonia, with ground glass appearance and respective sketchy shadows being the most well-known patterns [5]. As expressed in the sixth edition of COVID - 19 Treatment Regimen (Trial Implementation) distributed by the National Health Commission of the People's Republic of China (2020), the potential courses of 2019-nCoV transmission are essentially through direct contact and droplet transmission. Aerosols transmission is likewise a potential course of transmission when there is an introduction to virus in a closed environment [6].

Because of the unique qualities of dental procedures, where enormous number of droplets and aerosols concentrates could be produced, the danger of cross contamination is high between dental practioners and patients. Aside from the aerosols generated, the closeness of the dentist to the patient's oropharyngeal region builds the danger for the dental professionals. Closing dental works during the pandemic can lessen the exposure of the virus to the public, yet will expand the enduring of the person needing dental treatment. Thus, every patient ought to be considered as possibly tainted by this infection, and everything the dental practices require to survey their contamination control approaches, designing controls and supplies. Medical care suppliers must stay up with the latest about the developing virus and give sufficient preparing to their staffs to advance numerous degrees of screening and preventive measures permitting dental consideration to be given, while alleviating the spread of this novel infection [7, 8].

This calls for the creation of standard guidelines for dental care provision during the worldwide spread of the pandemic and /or local epidemic outbreaks. This article is aimed to elicit major reorganization in dental practice such as the reinforcement of the concept of tele-dentistry, protocols to be followed in a dental set up to create a safe environment for the patient and the dental practitioners .

TRASNMISSION OF COVID-19 IN DENTAL SET-UP:

The remarkable attributes of the dental set up makes it the high wellspring of reaching with the infection. A few likely situations of COVID - 19 transmission have been portrayed. The transmission through contact with droplets from talking, coughing, sneezing, and vaporizers produced during clinical systems is normal and for the reasons; dental facility is profoundly helpless for cross disease. COVID - 19 was as of late distinguished in salivation of the tainted patients, this finding is an update that dental/oral and other wellbeing experts should consistently be tenacious in securing against the spread of the irresistible disease [1].

The transmission dynamics in a dental clinic can occur through four major routes

- Direct exposure to respiratory secretion containing droplets, blood, saliva, or other patients
- Indirect contact with contaminated surfaces[9]

Droplets and Aerosols and Their Significance in Transmission of Diseases:

At the point when an individual coughs, talks, sneezes; large droplets and small droplets or aerosols are generated. These enormous droplets because of gravity tumble to the ground however then again little particles

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build up have relatively low setting speed, in this manner stay noticeable all around for an impressive long time and travel further before they can enter respiratory tract or sullied surfaces. In dental settings, bio mist concentrates that are made from the water coolant during the dental system is debased with microscopic organisms, growths and different pathogenic infections, and can possibly glide noticeable all around for impressive measure of time and be inhaled in by the dental specialist or the patients[5].

SALIVA AS BIO-MARKER IN COVID-19

SARS-CoV-2 has been segregated from the saliva of COVID-19 patients. . ACE-2 is an important receptor for COVID-19. In a previous study about severe acute respiratory syndrome—coronavirus (SARS-CoV), salivary gland epithelial cells with high expression of ACE2 were infected. The expression of ACE2 in minor salivary glands was higher than that in lungs. In addition, SARS-CoV RNA can be detected in saliva before lung lesions appear. This may explain the presence of asymptomatic infections. For SARS-CoV, the salivary gland could be a major source of the virus in saliva [10]. Even after patient recuperation, recurrence during the improvement time frame was reported. This is due to the presence of the infection strains in saliva for up to 29 days [8].

CONTACT WITH THE CONTAMINATED SURFACES:

Some studies have shown that human coronavirus such as endemic human coronavirus (HCoV), MERS-CoV, or SARS-CoV can remain on surfaces of metal, glass, or plastic for up to several days [12]. Along these lines, as surfaces in dental facility fill in as scenes for droplets and aerosols blended in with patient's saliva and additionally blood, they can successfully help spread disease. Corona virus can effectively keep up their destructiveness at room temperature for a long time. Their action at humidity was fundamentally higher than 30%. In the dental condition, it appears to be that keeping surfaces perfect and dry will assume a noteworthy function in preventing 2019-CoV transmission [9].

Dental experts are at a higher danger of contracting themselves with the infection and can likewise be the wellspring of cross contamination given the transmission of the infection through close contact with the patient during dental methods and furthermore having contact with the mucous of the oral cavity, sufficient safety measures and disease convention must be followed so as to give a protected dental treatment venture for both the specialist and patient.

THE NEW NORMAL IN DENTAL SET UP

As dental treatment invariably involves close inspection, examination, diagnostic and therapeutic interventions of the naso-oro-pharyngeal region, dental professionals are most susceptible to get infected with corona virus. As a result, during the current pandemic, most routine dental procedures all around the world are suspended and only the emergency dental procedure and surgery is being performed. However looking at the current increasing trend of COVID-19 CASES, it does not appear that this pandemic will end anytime soon. In fact, even the WHO has recently feared that this virus may become just another endemic virus in our communities and may never go away. If these speculations are true and COVID 19 indeed becomes endemic, dental practice will need to reorganize and innovate to continue dental care with minimal risk of cross infection [12]. Based on the experience gained from the previous outbreak of SARS-CoV and the data available on SARS-CoV-2 and its associated disease (COVID-19), certain specific measures are discussed for dental patient management in this epidemic period of COVID-19.⁶ Mainly four phases are crucial in the dental set up: patient triage, patient's entrance into the practice, dental treatment, and after-treatment management [13].



Table 1

Patient prior to arriving at the dental clinic	1) Tele – screening		
	2) Patient to be informed about the		
	instructions to be followed during their appointment. 3) Discourage the presence of accompanying people		
Prior to procedure	1) Body temperature ought to be recorded		
	2) Use of alcohol based sanitizer or hand wash		
	3) Remove all the objects like newspaper , toys		
	etc. in the waiting room		
	4) Avoid the presence of more than two		
	patients in the waiting room.		
	5) 1-min mouth rinse with 0.2% to 1%		
	povidone, 0.05% to 0.1% cetylpyridinium chloride, or 1% hydrogen peroxide		
Preparation to dental treatment	1) Dentist should perform an effective hand		
	wash for at least 60 seconds prior to wearing gloves.		
	2) Application of personal protective		
	equipment		
After dental treatment	1) 5 to 10 minutes air change is recommended		
	2) Removal of protective equipment.		
	3) Disinfection of the room.		

TELE-DENTISTRY AND ITS UTILITY DURING COVID-19 PANDEMIC

Beginning screening through phone to recognize patients with suspected or conceivable COVID-19 disease can be performed distantly at the hour of booking appointment [6]. Tele-dentistry can likewise be critical to distinguish people from high danger zones. Patients should be urged to be in self isolation especially in the event that they have been to territories considered at high danger of infection[7]. Tele-dentistry can be a significant apparatus during this pandemic since even assessment/finding should be possible through method of advanced communication[14]. In view of the signs and manifestations a choice ought to be made whether the patient should be found in dental facility. Appropriate drugs and definite home consideration guidelines ought to be given by methods for tele-dentistry in circumstance where dental treatment can be delayed [15]. Tele-diagnosis, Tele-triage and Tele-monitoring are the subunits of tele-dentistry which incorporates trade of pictures of oral injuries, to provide appropriate pharmaceutical management and follow-up of patients through digital means after surgical and non-surgical procedures [12].

Tele-dentistry, despite the fact that an old idea, isn't broadly acknowledged neither by the dental specialist or the overall population because of reasons like being mechanically testing and practioners hesitant to make wrong finding. Notwithstanding, acknowledgment of teledentistry can carry an extraordinary change to proceed with dental work on during the current pandemic circumstance.

PATIENT SCREENING AND ASSESSMENT

The necessary dental treatment should experience suitable screening and evaluation before the dental method. DHCP (Dentist, Dental Hygienist, Dental Assistants and Receptionist) need to revive their knowledge and capacities concerning infection control and follow the shows recommended by the material experts to guarantee themselves and their patients against defilement. An unmistakable history should be gotten from the patients referencing them to fill the screening structure for COVID-19 infection which should consolidate the going with inquiries [15]:

Pretriage and triage questionnaire to evaluate patient's potential risk of SARS-CoV-2 infection [13]:



Table 2

DO YOU HAVE FEVER OR EXPERIENCED FEVER WITHIN 15 DAYS?

HAVE YOU EXPERIENCED A RECENT ONSET OF RESPIRATORY PROBLEMS, SUCH AS COUGH OR DIFFICULTY IN BREATHING WITH IN PAST 14 DAYS?

HAVE YOU, WITHIN THE PAST 14 DAYS, TRAVELED TO A COUNTRY REPORTED TO BE INFECTED ACCORDING TO THE WORLD HEALTH ORGANIZATION WITH DOCUMENTED COVID-19?

HAVE YOU COME IN CONTACT WITH CONFIRMED 2019-nCoV INFECTION WITH THE PAST 14 DAYS?

HAVE YOU COME INTO CONTACT WITH PEOPLE FROM THE NEIGHBORHOOD/REGION REPORTED TO BE INFECTED ACCORDING TO WORLD HEALTH ORGANIZATION WHO HAVE RECENTLY DOCUMENTED FEVER OR RESPIRATORY PROBLEMS WITHIN THE PAST 14 DAYS?

ARE THERE AT LEAST TEO PEOPLE WITH DOCUMENTED EXPERIENCE OF FEVER OR RESPIRATORY PROBLEMS WITH IN THE LAST 14 DAYS HAVING CLOSE CONTACT WITH YOU?

HAVE YOU RECENTLY PARTICIPATED IN ANY GATHERING, MEETINGS, OR HAD CLOSE CONTACT WITH MANY UNACQUAINTED PEROPLE?

Body temperature ought to be enrolled, potentially with a contact free forehead thermometer, and the presence of suspect indications (coughing, sneezing, respiratory trouble) ought to be rejected. It is important to apply all the safety measures to the person accompanying the patient. On the off chance that the body temperature level is >37.5 degree Celsius treatment ought to be postponed. If the patient answers "no" to all the inquiries and if the patient is afebrile, the patient can be treated by the dental specialist following the suggested protocol [16]

WAITING ROOM

- 1. Provide adequate ventilation
- 2. Remove all the objects that could favour cross infection
- 3. Avoid long stay in waiting room
- 4. Avoid presence of more than two patients.
- 5. Use of 0.1% sodium hypochlorite or 70% isopropyl alcohol for the disinfection of surfaces[17]

TREATMENT PROTOCOLS

HAND WASHING

People are now more aware of hand washing importance to prevent acute respiratory infection. According to WHO, hand hygiene involves either cleaning hands with an alcohol based hand rub or water and soap; both have the same efficiency. The dental practioner should perform careful hand washing for at least 20 seconds, employing a 60% to 85% hydro alcoholic solution to prior to wearing gloves [18].

IMAGE 1: HAND WASHING TECHNIQUE





PERSONAL PROTECTIVE EQUIPMENT (PPE)

The WHO suggests that medical services workers should wear a medical mask when going into a room where patients associated or affirmed with being contaminated with COVID-19 are conceded and in any circumstance of care gave to a suspected or affirmed case. The CDC expresses that, when accessible, respirators (rather than face covers) are liked; they ought to be organized for circumstances where respiratory insurance is generally significant and for the consideration of patients with microbes requiring airborne precautions[19]. During dental method, the spread of the microorganisms spread fundamentally to the substance of the dental specialist, particularly in the eyes and all around the nose, which are basic parts for the transmission of the disease. There are down to earth rules suggested for dental specialists and dental staff by the Centres for Disease Control and Prevention (CDC), the American Dental Association (ADA) and the World Health Organization to control the spread of COVID-19. Like with different infectious contaminations, these proposals incorporate individual defensive gear, hand washing, detailed patient assessment, rubber dam isolation, mouth rinsing before dental methods, and disinfection of the center [20].

MASK

On the off chance that the important precautionary measures are not taken, it is inescapable that administrators can get contaminated through contact of the mucous secretions like blood, salivation, and droplets concentrates from a possibly infective patient.

- 1. Protect personnel from contact with patient infectious material;
- 2. Protect patients from infectious agents carried by healthcare workers;
- 3. Limit the potential spread of infectious respiratory aerosol between patients [21].

Surgical masks (SM) are utilized to prevent that enormous particles, (for example, droplets and aerosols), containing microorganisms, could arrive at nose and mouth. In spite of the fact that their motivation is to protect patients from healthcare experts (and healthcare group from patients) by limiting presentation to



salivation and respiratory discharges, they don't make a seal against the skin of the face and therefore are not demonstrated to protect individuals from airborne irresistible infections. Rather, during the treatment of patients with respiratory diseases, specific masks must be worn; National Institute for Occupational Safety and Health (NIOSH) - certified N95 (95%), N99 (99%) and N100 (99.7%) [21]. While removing the mask, front of the mask must not be contacted since they are tainted. Grasp bottom ties or elastics of the mask, at that point the ones at the top, and eliminate without contacting the front. And at last dispose of in a waste container [6].

GOGGLES/FACE SHIELDS

The decision of individual eye protection gadgets, (for example, goggles or face mask) shifts as per the presentation conditions, other PPE worn, and the requirement for individual vision. So as to ensure the protection for eyes, eyeglasses and contact lenses are not viewed as reasonable. Eye security must be compelling and yet agreeable and permit adequate vision. There are various estimates that improve the solace of the glasses, for instance against haze covering, various sizes, and the chance of wearing them on solution glasses. Despite the fact that they give satisfactory eye protection, glasses don't shield from splashes or spray different part of the face. Dispensable or sterilizable face shields can be utilized in option in contrast to glasses. Face shield secures different regions of the face other than the eyes (glasses just ensure the eyes). The face shields that stretch out from the jaw to the brow offer better insurance of the face and eyes from shower and splashes[21] .Remove goggles or face shields from the back by lifting head band or ear pieces. In the event that the thing is reusable, place in assigned repository for reprocessing. In any case dispose of in a waste holder [6].

GLOVES

During every single dental methodology, it is difficult to maintain a strategic distance from contact of the hands with blood and salivation. That is the reason all administrators must wear defensive gloves before performing procedures on patients. Gloves must be changed with every patient and at each contact with contaminated surfaces to avoid cross-contamination. The dental specialist, yet additionally other dental colleagues must wear gloves during dental methods. The utilization of the glove, particularly if in latex, involves development not perceived of micro perforations which become particularly significant from a numerical point of view after 60 minutes and which induce an increase in biological risk. The concurrent utilization of two sets of gloves significantly diminishes the entry of blood through miniature holes. There are no huge decreases in manual abilities and the affectability of the administrator wearing the two fold glove [21]. So as to securely eliminate the gloves, utilizing the gloved hand, handle the palm territory of the other gloved hand and strip off the principal glove; hold eliminated glove in gloved hand. Slide fingers of unloved hand under outstanding glove at wrist and strip off second glove over first glove. Dispose of gloves in squander container [6]

PRE-PROCEDURALMOUTHRINSE

One of the most proficient approaches to diminish the extent of microorganism in oral pressurized canned products is pre-procedural mouth rinse [16]. Despite the fact that the impact of pre procedural mouth flush against COVID is at this point unclear, it has been recommended that the patient ought to perform brief mouth wash with 0.2% to 1% povidone, 0.05% to 0.1% cetyl pyridinium chloride, or 1% hydrogen peroxide before the dental procedure [12].

RADIOGRAPHS

Past research demonstrated that microorganisms can stay suitable on radiographic equipment for up to 48 h and up to about fourteen days in X-beam developer/fixer. If proper disinfection techniques is not applied when taking any dental radiograph, the potential for cross-infection of radiographic equipment with blood and additionally salivation would be fundamentally high [22]. Intraoral imaging ought to be limited and extra oral radiographs ought to be used to lessen extreme salivation and gag reflex related with intraoral radiographs [8].

PROCEDURE PROTOCOLS

Rubber dam: Using a rubber dam lessens droplet secretion. Rubber dam must be utilized during endodontic treatment and in paediatric and helpful dentistry when hand piece is required. Likewise, utilizing rubber dam during fixed partial denture or single-crown preparation should be taken into consideration. For example, set up

ELECTIVE

DENTAL



a supra-gingival margin for the posterior bridge or apply a split dam technique. Furthermore, it tends to be useful to find the rubber dam to cover the nose and diminish the transmission of COVID-19[23].

Treatment consideration:

DENTAL EMERGENCY

The ADA has kept up a predictable remain since the pandemic was perceived. They called upon dental specialists to defer elective dental methodology for every dental patient, and to give dental treatment just to dire or crisis cases [23]. The principle objective of the treatment during the pandemic time frame is to evade as much as aerosol generation. Ultrasonic instruments, for example can put a higher danger of creation of aerosol. Since hand and ultrasonic instrumentation are both similarly effective in dispensing with plaque and calculus, it is proposed to physically scale and polish them. Besides, the utilization of rapid hand pieces and three – way needles ought to be limited by dental specialist during COVID-19 episode.

Dental procedure can be divided into the following categories [24]:

URGENT DENTAL CARE

Table 3

OTHER URGENT DENTAL CARE

1. Uncontrolled	1. Severe dental pain	1. extensive dental caries	CARE
bleeding	from pulpal inflammation	or defective restorations causing	 Initial or periodic
	2. Pericoronitis or third	pain	oral examinations and
2. Trauma involving	molar pain	2. manage with interim	recall visits.
facial bones, potentially	3. Surgical	restorative techniques when	2. Aesthetic dental
compromising the patient's	postoperative osteitis , dry	possible	procedures.
airway	socket dressing changes	3. suture removal	3. Restorative
	4. Abscess or localized	4. Denture adjustment on	treatment of
3. Cellulitis or diffuse	bacterial infection resulting in	radiation/oncology patients.	asymptomatic teeth.
soft tissue bacterial	localized pain and swelling	5. Denture adjustments	Extraction of
contamination with	5. Dental trauma with	or repairs when function	asymptomatic teeth
intraoral or additional oral	avulsion/luxation	impeded	
growing that conceivably	6. Dental treatment	6. Replacing temporary	
bargain patient's airways.	required prior to critical	filling on endo-access openings	
,	medical procedures	in patients experiencing pain	
	7. Final crown/bridge	7. Snipping or adjustment	
	cementation if the temporary	of an orthodontic wire or	
	restoration is lost, broken, or	appliance piercing or ulcerating	
	cause gingival irritation	the oral mucosa	
	Biopsy of abnormal tissue		

SAFE AEROSOL – FREE EMERGENT (SAFE) DENTISTRY

Safe aerosol – free emergent dentistry expands on a prioritization of the most widely recognized patient's needs, and efficiently chooses groups of successful, proof based, and worth based consideration that don't need aerosol creating methodology.

- 1) Acute pain, swelling or infection: Depending on diagnosis, pulp devitalisation/temporary filling (pulpitis), antibiotic therapy (acute inflammation) and/or local anaesthesia and tooth extraction.
- 2) Toothache due to caries without pulpal involvement: Silver-diamine-fluoride application (SDF), glass-ionomer sealants/atraumatic Restorative Treatment (ART), fluoride varnish/gel and/or tooth brushing with high fluoride-containing toothpaste.
- 3) Acute periodontitis: Hand scaling and metronidazole/amoxicillin combination for one week.

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4) Denture repair/reline, lost crown or orthodontic bracket, or orthodontic wire: Denture repair with soft re-line, crown and bracket re-cementation, and wire adjustment or repair, removal of stiches from previous surgery [14].



POST – TREATMENT PROTOCOLS

After the technique, all the dispensable gear ought to be moved for cleansing and elevated level sterilization ought to be performed. After every patient, at any rate a 5 minutes air changes is exhorted. Since the infection will in general stay with airborne particles, it is prescribed not to eliminate PPE preceding leaving the debased area [13]. Surface disinfectants can viably inactivate the infective microorganisms inside one moment. These surface disinfectants contain 62% to 71% ethanol, 0.5% hydrogen peroxide and 0.1% sodium hypochlorite. Surfaces ought to be sterilized after every patient visits, particularly surfaces in closeness to the working territories. Reusable apparatuses and gear must be appropriately pre-treated cleaned sanitized and appropriately put away until next case[5]. Managing the clinical waste like utilized cotton, cloth and needles are additionally significant. Before any improper amassing, dental office waste ought to be regularly shipped to the foundation's brief stockpiling facility [9]. Fumigation isn't down to earth for dental operatory, anyway measures, for example, cleaning the floor with 1% sodium hypochlorite can help decrease the danger of cross contamination. Coronavirus is not the same as influenza, the normal cold and SARS-1 and may require unexpected insurances in comparison to dental groups have been utilizing since the mid-1980s [25]

Recommendation

As far as the pandemic is concerned, it is evident that dental professionals should get adjusted to the current situation and continue to provide the required treatment to the public and at the same time avoid the spread of infection. Patient has to be aware of the protocols that has to be followed. Instruction banners and notice can be hung in the lifts or waiting area regarding social distancing, DO'S and DONT'S regarding respiratory cleanliness. Availability of alcohol based hand rub should be ensured at the entrance of the clinic. Appointment timing should be strictly followed to avoid crowding in the hospital or clinic premises. Patients presenting with mild symptoms, should be encouraged for quarantine and appropriate pharmacological management ought to be given for their dental problem. An interval or time gap for at least 15 minutes has to be given between each procedure. That time gap can be used for circulating proper ventilation, change and prepare instruments for the next patient, the dental chair has to be sanitized and the hand piece to be cleaned. In case of air conditioned clinic, it is better to not use them and operate with windows opened especially while performing aerosol procedures which tend to remain in air for considerable long time. Following strict sterilization protocol is must. A prepared individual ought to be accessible to attempt Transport, Cleaning, Drying, Packing, Sterilization, Storage and testing the nature of sterilization according to the standard rules and producer's guidelines. Adequate space for capacity of extra things of PPE and sanitization and cleansing instruments and chemicals must be guaranteed.

CONCLUSION

Dental specialist essentially are at high danger of presentation to irresistible disease. The development of COVID-19 has got new difficulties and obligations to dental experts. Notwithstanding standard precautionary measures, usage of extraordinary safeguard could keep transmission from asymptomatic transporters. At present the impacts of COVID-19 around the world are compounding step by step. Thus, at most consideration ought to be taken so as to offer the necessary dental support to the patients and furthermore at the equal time forestall the transmission of the infection. It is additionally imperative to settle on educated clinical choices and instruct people in general to forestall alarm while advancing the wellbeing and prosperity of our patients during the difficult occasions. Dental group must revaluate the general infective danger level of each dental strategy and regard the new usable conventions that are or will be defined by individual boards of trustees so as to diminish however much as could be expected the danger of the cross disease for the wellbeing and security of their locale.

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