4-16-2022

Analysis of a Future Dentist

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The Future of Dentistry

Since the COVID-19 outbreak in March of 2020, our entire world has changed. These changes are especially prominent within the medical field. We had to decide whether medical practices could even be open and how to continue providing care in a safe manner. The dental field was faced with these challenges and has already made alterations that will more than likely last for decades. Even before COVID, the dental field changed at an exponential rate; new technology and research continue to improve the practice. Due to the pandemic and the ever-changing practice, dentistry is bound to be different 10 years from now.

The dental field has a larger potential for contagion because they are exposed directly to patients' oral cavities. A study found that aerosol contaminants can be found up to 60 cm from a patient's head and they can be suspended in the air for up to 30 minutes (Checchi, 2021). These particles can land upon the dental chair, the dentist themselves, and the air is contaminated during and after the procedure as well. Once settled, it has been found that Sars-CoV-2 can remain on surfaces for a maximum of 9 days (Checchi, 2021).

Although that statistic may be concerning, the disease can easily be killed in 1 minute with an effective disinfectant. It is recommended that any potentially contaminated surface is cleaned with a hydroalcoholic disinfectant containing at least 60% alcohol (Checchi, 2021). Additionally, each procedure room should have their own air depuration system to filter the air. A germicidal UV radiation system may also be brought into the room after the patient leaves to damage microbial DNA and RNA (Checchi, 2021).

There is also a relatively new device called the Isovac which functions to limit aerosol contaminants in the first place. It is essentially an intraoral suction that remains in place throughout the entirety of a dental procedure. The Isovac provides greater efficiency in

suctioning and prevents aerosols better than the high-speed suction that a dental assistant typically uses. Often, these two are used in combination for maximum aerosol prevention. The use of the Isovac makes the patient more comfortable and creates a safer environment for the dentist and dental assistant.

In addition to elevated cleaning demands and aerosol prevention, proper Personal Protective Equipment, or PPE, is vital. As we are all now familiar, Filtering Face-piece (FFP) masks are highly effective in viral protection. The most efficient and recommended masks are FFP2/N95, FFP3/N99 and N100 (Checchi, 2021). The ocular pathway is also at risk of infection, so either safety glasses with wide frames or plastic face shields are recommended.

Pre-screening surveys are now required by most appointment-based services. When a patient arrives, their body temperature should be taken using a contact-free forehead thermometer (Bhanushali, 2020). They should also undergo a brief survey to assess if they have had potential exposure to an infected individual (Checchi, 2021). If the patient has any symptoms of COVID-19, they are denied service and must reschedule.

Additionally, many offices have started to require a “pre-rinse” where patients swish with mouthwash before any treatment begins. Sars-CoV-2 is sensitive to oxidation therefore, mouth rinses containing 1% hydrogen peroxide, or 0.2% povidone-iodine have been shown to be most effective (Checchi, 2021).

Without a doubt, hand hygiene must always be implemented. It is recommended to wash both hands with soap and scrub efficiently before rinsing. A dentist may also choose to use hand sanitizer as a quicker option in between patients. The only requirement is that the sanitizer is at a concentration greater than 60%-65% alcohol to dissolve fatty molecules of the external lipid layer of the virus (Checchi, 2021).

Ironically, the future of dentistry will also include the limitation for their need. Many corporations want to work towards a cavity-free future. For this to be achievable, we need to provide better education on the importance of nutrition and hygiene, especially with the higher consumption of sugars across the nation (Pitts, 2021). Some believe that the national government even needs to take action for proper promotion, engagement, and impact to be achieved whether that be through regulation or solely funds (Westgarth, 2021).

An attempt should be made to use teledentistry. Teledentistry is known as the process of sharing digital information, digital consultations, analysis of data, and how the information is networked (Bhanushali, 2020). If a dental issue or exam may be completed digitally/virtually than that is preferred. A virtual exam can be used to determine whether a patient must come into the clinic. It is also important to decide what is considered a dental emergency. Any uncontrollable pain or severe pain/inflammation would require dental attention as soon as possible (Bhanushali, 2020). A survey on the effectiveness of teledentistry showed that over 90% of the subjects found the digital experience enjoyable (Rahman, 2020).

Within the next 10 years, new technologies will continue to keep the dental field at the utmost efficiency. One of these newer tools is known as additive manufacturing which joins materials layer by layer to make 3D objects. Additive manufacturing will prove extremely effective for dentistry since it can customize parts to fit patients' specific mouths (Noort, 2012). Additive manufacturing is the joining of materials, layer upon layer, to make objects from a 3D model, instead of subtractive manufacturing methodologies. It is worth noting that the process of additive manufacturing is in fact ideally suited to dentistry, which has a tradition of producing customized parts made to fit the patient and not the other way around. The dental field already uses additive manufacturing for Stereolithography (SLA), Fused deposition modeling (FDM),

Selective electron beam melting (SEBM), Laser powder forming, and Inkjet printing, so there is endless potential (Noort, 2012). Additive manufacturing is beneficial because it eliminates much of the expense of highly skilled labor that comes with traditional manufacturing, it is also much faster.

Dentists rely upon radiographs and intraoral scans to make large-scale business decisions. Eventually Artificial Intelligence will be capable of immediate claim approvals (Chen, 2020). Dentists will be able to upload their radiographs, intraoral scans, and photos to an insurance provider then they will immediately know what the patient's insurance will cover (Chen, 2020). This will provide faster dental care without any fear of no insurance coverage.

Overall, the COVID-19 pandemic brought many unforeseen circumstances to the dental field, but by making accommodations many practices have already transitioned back into full swing. Dentistry will forever be changing, and we are bound to see new technology in the next decade. From teledentistry to additive manufacturing to AI, the possibilities are endless. Without a doubt, these new technologies will be beneficial and allow for advanced patient care.

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