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# Effects of a Mandatory COVID-19 Testing Policy on No-Show Rates for Aerosol Generating Procedures

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# Effects of a Mandatory COVID-19 Testing Policy on No-Show Rates for Aerosol-Generating Procedures

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ABSTRACT

***Purpose.*** **To determine the impact of a mandatory COVID-19 testing policy on visit no-show rates.**

***Methods.*** **We conducted a retrospective chart review at NYC H+H/Bellevue's Pediatric Dental Clinic, comparing no-show rates and dental work completed before and during this policy.**

***Results.*** **We assessed a total of 812 scheduled appointments. After the policy, we found no statistical difference between no-show rates, more quadrants of dental work completed per visit (P<0.001) and shorter interval times between appointments (P<0.001).**

***Conclusion.*** **The policy did not increase visit no-show rates. We also found more treatment completed in a shorter time frame.**

In 2020, the COVID-19 pandemic began to affect all aspects of life in the United States. The primary transmission pathway for COVID-19 was found to be airborne or via respiratory droplets. Many professions were deemed high risk for transmission of COVID-19, which included dentists who perform aerosol-generating procedures (AGPs).[1] AGPs are defined by the use of dental equipment, such as ultrasonic scalers and high-speed handpieces, which result in the production of airborne droplets. In dental settings, these particles can remain suspended, increasing the risk for developing disease.[2]

In March of 2020, the CDC recommended dental practitioners avoid all elective treatment and only provide emergency treatment. Across the globe, practitioners detected increasingly more caries in children because families feared going to the dentist and contracting COVID-19.[3,4] Many pediatric dental practitioners resorted more to noninvasive, non-aerosol procedures to stabilize dental decay, such as atraumatic restorative techniques, interim restorative techniques, Hall crowns and silver diamine fluoride.[2]

As COVID cases from the first wave began to decline and restrictions were loosened, dental facilities adopted new safety protocols to reduce the risk of transmission during dental visits. Examples of new protocols included limiting the number of individuals present at an appointment, televisits, telescreening, in-office pre-screening, temperature checks, greater levels of protective personal equipment (PPE), high-efficiency particular air (HEPA) filtration, hand hygiene protocols and surface disinfection.[1,3,5,6]

In July 2020, a policy was implemented in the pediatric dental clinic (PDC) at New York City Health + Hospitals / Bellevue (Bellevue). The protocol required proof of a negative COVID-19 test within five days of the patient's first scheduled AGP appointment, which was scanned into their electronic health record (EHR). The test was then valid for up to 10 days after the test date, to accommodate for

a possible necessary second AGP appointment. For patient convenience, the administrative staff scheduled COVID-19 tests for patients at either Bellevue or a convenient New York City Health + Hospitals (NYCH+H) location close to the patient's home.

Also, for patient convenience, this policy accepted PCR antigen tests and rapid antigen tests from non-NYCH+H sites. If a patient's COVID-19 test was positive, the policy permitted rescheduling the AGP appointment after a minimum 14-day quarantine, with allowance to return, so long as the patient was asymptomatic and all symptoms resolved. Additionally, patients with a positive test were exempt from retesting for 90 days from the date of their positive test result.

The purpose of this study was to determine whether the required COVID-19 testing policy had any impact on no-show rates, number of quadrants completed per visit and number of days between a patient's AGP appointments in Bellevue's PDC. The study hypothesized that for children and adolescents diagnosed with dental caries, a mandatory COVID-19 test for AGPs at Bellevue's PDC would increase the appointment no-show rate as compared to a time prior to COVID-19. We also hypothesized that there would be no difference in number of quadrants completed per visit or length of time between AGP appointments.

## Materials and Methods

This retrospective chart review was approved by the New York University (NYU) Langone Institutional Review Board (i21-00877) and the NYCH+H's System to Track and Approve Research (STAR) (00003347). Study subjects were patients attending Bellevue's PDC who met the inclusion and exclusion criteria. Sample size was calculated using power analysis estimates with a confidence level of 95%, margin of error of 5%, standard deviation of 0.5 and z-score of 1.96. The estimated effective sample size obtained was 218. Subjects were selected with the following inclusion criteria: age 4-17, diagnosed with dental caries, and scheduled for an AGP during the two time periods: October 1, 2019, through February 29, 2020, for the pre-COVID-19 policy (control group), and October 1, 2020, through March 31, 2021, for the COVID-19 policy (case group). There were an equal number of patients in each group (250 each). Appointments were excluded from the study if treatment only included use of a slow-speed handpiece or ultrasonic scaler. All hygiene appointments were excluded from the study, as it was not clear when ultrasonic scaling was used versus hand scaling in the control group.

Data was collected from Bellevue's dental EHR system *(Dentrix Enterprise v 11.0, 2021)*. Study data were collected and managed using REDCap electronic data capture tools. Data collected for each subject included age, gender, month and year of dental visit, appointment status, number of quadrants completed per appointment, and number of days between each scheduled visit. All information was de-identified, using a separate key to identify medical record number and subject ID number. The appointment status (show/no-show), number of quadrants completed per visit and number of days between a patient's AGP appointments were compared for both the control and the case group using chi-square and student t-tests through JASP Team (2022). JASP (Version 0.16.3) [Computer software]. (CI=95, $P<0.05$).

## Results

The study included 500 patients with a total of 812 visits from Bellevue's PDC who met the inclusion criteria. The control group and case group each consisted of 250 subjects. Overall, appointment status data revealed a 75% (610 visits) show rate and 25% (202 visits) no-show rate. Table 1 demonstrates the distribution of patient visits in the two groups.

Table 2 contains the data of each visit collected, including appointment status (show versus no-show), number of quadrants completed per visit (1 versus 2 or more), and

Table 1: Socio-Demographic Profile of Patient Visits in Control versus Case Group (n=812)

| | Pre-COVID Policy / Control (%) | COVID Policy / Case (%) |
|---|---|---|
| **Scheduled AGP Visits** | 367 (45) | 445 (55) |
| **By Age (years)** | | |
| **4-6** | 84 (10) | 102 (13) |
| **7-12** | 181 (22) | 188 (23) |
| **13-17** | 102 (13) | 155 (19) |
| **By Gender** | | |
| **Male** | 172 (21) | 188 (23) |
| **Female** | 195 (24) | 257 (32) |

Table 2: Appointment Visit Variables for Control and Case Group

| | Pre-COVID Policy / Control | COVID Policy / Case |
|---|---|---|
| **Appointment Status** | | |
| **Show** | 270 | 340 |
| **No-Show** | 97 | 105 |
| **# of Quadrants** | | |
| **1** | 228 | 240 |
| **2 or more** | 41 | 100 |
| **# Days Between Visits** | | |
| **10 or less** | 16 | 69 |
| **11 or more** | 109 | 61 |

number of days between each visit (10 days or less versus 11 days or more). When comparing the control and case groups, results showed no statistical difference between no-show rates, even when stratified by age and gender.

The number of quadrants completed per visit showed a statistically significant difference (P<0.001), with more quadrants completed per visit during the COVID-19 policy case group as compared to the control group (Figure 1). Furthermore, with statistical significance, the case group showed patients returned for subsequent AGP visits in shorter intervals as compared to the control group (P<0.001) (Figure 2).

## Discussion

We hypothesized that requiring a COVID-19 test prior to AGPs would create an additional barrier to dental treatment, thereby increasing no-show rates for scheduled appointments. Many barriers to care existed before the pandemic, particularly in the communities at high risk for pediatric dental caries. One systematic review explored and identified facilitators and barriers to pediatric patient compliance for attending dental visits. One common finding among studies in this review was reduced dental attendance due to conflicts with school schedules, examinations, travel distance and time required to attend appointments.[7]

Figure 1: Number of Quadrants Completed per AGP Visit for Pre-COVID Policy / Control and During COVID Policy / Case (P<0.001)

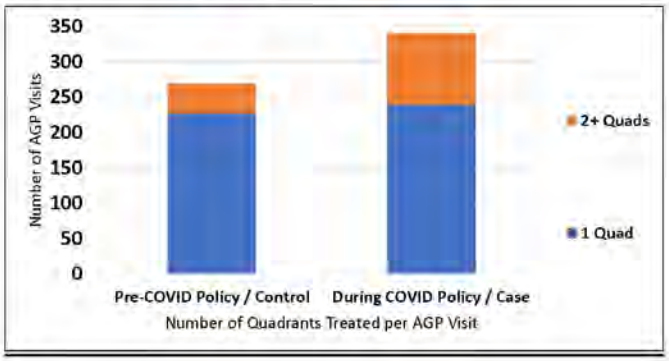
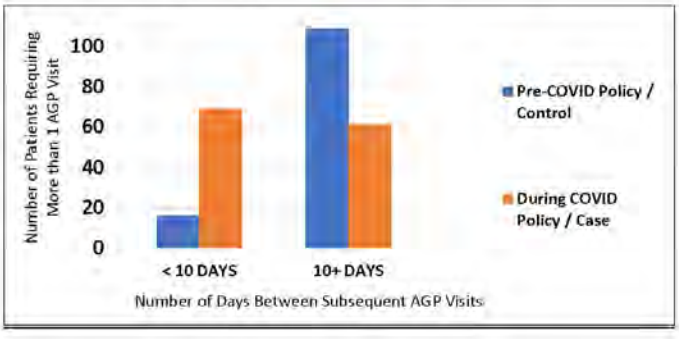



Figure 2: Number of Days between Subsequent AGP visits for Pre-COVID Policy and During COVID Policy (P<0.001)




In this study, authors perceived these same reasons as potential barriers to compliance with a COVID-19 test requiring an additional appointment. However, on the contrary, this study revealed no change in patient attendance to dental appointments after adopting a COVID-19 testing policy. Possible reasons for this finding may include school and work being remote during COVID-19, which may have alleviated conflicting schedules and time constraints for both parents and children.

Two studies discovered more compliance with dental visits in younger children compared to older children, owing to more dependency on parental decisions and willingness.[7] Furthermore, another study found the highest rate of missed dental appointments occurring between the ages of 7 to 12.[8] On the contrary, this study showed no difference when comparing younger and older children or any age groups in both the control and case groups. Moreover, 12 studies concluded no implication between gender and dental visit adherence, analogous to the results found in this study,[7] whereas another study noted more failed appointments in males.[8]

With respect to COVID-19 transmission, many patients feared going to the dentist due to high risk of transmission. A questionnaire conducted in Brazil consisting of 1,003 parent respondents of children ages 0-12 years old revealed that 86% of respondents did not seek dental care due to fear level and current number of COVID-19 cases, even though 56% reported dental trauma or pain.[4] Avoidance of healthcare during the pandemic was a common experience.[9] However, this study rejects these findings, which may be due to mandatory COVID-19 testing prior to an AGP visit; the policy may alleviate concerns for patients and their caregivers regarding their own safety and risk of contracting COVID-19.

Many studies encourage and insist dental practitioners employ pre-procedural COVID-19 testing, including chairside rapid testing.[10] One study conducted in a hospital dental clinic for adult patients required COVID-19 testing within 48 hours of AGP procedures if use of a rubber dam was not feasible. Results of this study showed an increase in patient attendance and compliance with testing and receiving treatment (108 patients to 162) from May 2020 to July 2020.[11] Investigators noted patients felt safer, PPE was conserved, infection rate was minimized (19.2% to 3.5%) and more elective treatment could be performed safely.[11] These findings coincide with results from this study, showing no change in no-show rates, and the ability of practitioners to complete more elective dental treatment needs rather than be limited to primarily urgent or temporary noninvasive dental needs. Additional potential reasons for

completing more quadrants per visit may include practitioner motivation to reduce patient exposure, reduce advancing decay and prevent urgent dental needs.

Regarding the COVID-19 test, several perceived barriers may exist. Probable barriers might include fear of test, discomfort from test and positive test result. Inability of pediatric patients to comply with taking the COVID-19 test itself could lead to a reduction in show rates. Although this study did not evaluate the results of COVID-19 tests, testing positive may be a reason for not showing to an appointment. As mentioned in another study, being sick accounted for 45% of missed appointments for children, which was second highest to missing an appointment due to school exams or parents forgetting the appointment.[8]

On the other hand, if parents were able to successfully obtain a COVID-19 test prior to the child's AGP appointment, and the test was negative, they may have been more motivated to come in for their appointment. Additionally, they may have been keener to schedule any additional AGP appointments within the 10-day testing window, to avoid multiple COVID-19 tests for their child.

This study had several strengths, weaknesses and limitations. A strength is only one examiner reviewed charts and recorded data, eliminating the need for calibration. Additionally, the study contained a large sample size, with variation in demographics, which was equally distributed between the two groups, and provided a sample size representative of the general population of interest. This retrospective chart review also excluded any loss to follow-up, recall bias of subjects and did not pose any ethical considerations.

A weakness authors acknowledge is this study does not include qualitative data, including COVID-19 test results, indicating reasons for no-show appointments. Additionally, practitioner or patient beliefs or opinions regarding the COVID-19 testing policy were not assessed. Therefore, future research is recommended to better understand potential reasons for the increased amount of dental work per visit and shorter intervals between appointments during the COVID-19 time period.

This study evaluated the effects of a new pandemic, which was the biggest limitation to this study, because existing research is minimal and there are no replicative findings in a pediatric setting to compare results.

## Conclusion

The COVID-19 testing policy did not result in increased no-show rates for AGP appointments. During this policy, practitioners actually completed more quadrants of treatment in each appointment, and patients scheduled consecutive appointments in shorter intervals. Further research is needed to investigate possible reasons for these outcomes.

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