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"Is that for here or to go?" Drive-Through Pediatric Vaccine Clinic as a Novel Approach during a Global Pandemic

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Abstract

Objective: Routine childhood vaccination and well-child visits are essential for pediatric patients' preventative and public healthcare services. The COVID-19 pandemic had an immediate and significant decline in well-child visits and vaccine administration. A one-of-a-kind 'Drive-Through Vaccine Clinic' was established to improve the vaccination rate and alleviate parental anxiety about being exposed to COVID-19 infection.
Methods: Our initial focus was on children between 18 months – 4 years of age at the start of the pandemic, and then extended this to the back-to-school vaccines and the Influenza vaccines.
Results: The Drive-Through Immunization Station provided 745 vaccines to 415 patients between April and September, 2020. The median wait time involved from patient arrival to completion of vaccine administration was 5 minutes at the Drive-Through location. Patient and parent feedback was positive. The addition of the Drive-Through Clinic helped to significantly increase the total number of vaccines administered compared to the previous year.
Conclusion: In a global pandemic, innovative ideas to increase access to preventive healthcare should be a priority. In the future, this method of non-traditional vaccine administration, will allow for improved outreach efforts to underserved populations in our communities, and better disaster preparedness.

Introduction

Routine childhood vaccination and well-child visits are an essential part of preventative and public healthcare services for pediatric patients and form the core of all visits to a general pediatric clinic. Rural states often struggle to achieve complete vaccination coverage due to various reasons such as financial difficulties, transportation issues, and lack of providers.[1]

Despite the benefits of vaccinations, many children fall behind in their vaccination schedules even when there are no extenuating circumstances. During times of national emergency, the rates may decline further.

On March 13, 2020 the President of the United States responded to the COVID-19 pandemic and declared a national emergency. Significant disruptions in all areas of daily life were expected, but strains on healthcare services were the most prominent. In response, all states instituted shelter-in-place or stay-at-home orders for citizens. In most cases, routine and non-emergency services were suspended from diverting necessary resources to address the pandemic effects, which led to an immediate and significant impact on well-child visits and vaccine administration.[2] The ongoing crisis continues to cause a steady decline in pediatric vaccination rates all over the country. Many experts fear the drop in vaccinations has left children and communities more vulnerable to vaccine-preventable illnesses, which would further strain an already stressed system. Recognizing the impact of reduced vaccinations on population health, the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) have guided how to proceed with routine vaccinations, especially in children less than two years old. The direction included limiting crowding in waiting rooms, scheduling well and sick child visits at different times, and using telemedicine.

Despite our efforts to adhere to the guidelines, many families opted to forgo or delay necessary vaccinations for fear of exposure to COVID-19. In order to potentially improve the vaccination rate and alleviate parental anxiety and fear of being exposed to the COVID-19 virus, healthcare professionals at the General Pediatric Clinic (GPC) at Arkansas Children's Hospital (ACH) developed alternative strategies for administering routine childhood vaccinations. A review of the literature indicated that drive-through mass immunizations had been used for adult flu vaccinations.[4–6] However, there is limited information and study of the use of this modality for pediatric vaccinations.

Using lessons learned from drive-through flu vaccinations, the GPC staff decided to explore the potential of a Drive-Through Pediatric Vaccine Clinic to administer routine pediatric vaccinations. The goals were to (1) improve the vaccination rate during the pandemic by reaching as many children as possible, (2) provide a safe environment with limited to no potential exposure to COVID-19 commensurate with the state guidelines, and (3) study the effectiveness of such a clinic for future implementation in case of an emergency or disaster.

Methods

A drive-through immunization station was implemented on April 21, 2020, to service the 4 primary care clinics at Arkansas Children's Hospital in Little Rock (GPC, Circle of Friends Clinic (COF), Adolescent Clinic, and Southwest Community Clinic), and was staffed by personnel from GPC and COF. The drive-through structure was installed on the hospital campus just a block from each on-site primary care clinic.

Patient Identification

Patients due for vaccines were identified using the electronic health record EPIC, and the Arkansas state immunization information system WebIZ. Call-back lists and reminder-recall reports were reviewed by nursing staff, and eligible patients were identified using the following criteria: primary care physician was established at Arkansas Children's Hospital; they had attended a health supervision exam in the past 2 years; and had no complex medical conditions.

Target Population

The initial focus was on children between 18 months – 4 years of age. Within 2 weeks of starting the drive-through clinic, we observed an increase in well-child visits at the 4 primary care clinics for this age group. Therefore, we adjusted the patient population at the drive-through clinic to include children aged 11-16. Statewide vaccination data informed this decision. According to the CDC, 53.6% of adolescents receive all the recommended vaccinations in Arkansas during routine clinic operations.[7] We therefore saw this as an opportunity to increase the percentage of adolescents receiving vaccinations within the state. Children younger than 18 months were excluded since they were being seen in the clinic for their well-child visits and would have difficulty receiving vaccines in their car seats in their vehicles.

Pre Drive-Through Clinic Visit

Schedulers called and offered the drive-through clinic option for a shot-only appointment scheduled every 10 minutes during hours of operation. We prepared a patient education packet in advance for each scheduled patient, which included: WebIZ immunization record, return appointment information, vaccine information statements, and information on how to manage discomfort after shots. A reminder call was made to the parents a day before their scheduled appointment.

Drive Through Clinic Preparation and Workflow

The nursing staff prepared the vaccine inventory the morning of the clinic. Almost all vaccines are single-dose syringes or single-dose vials. Vaccine inventory preparation involved reviewing each scheduled patient record, determining which vaccines are needed for each patient, and determining Vaccines for Children (VFC) or Private inventory eligibility, counting the doses, and packing them in the coolers, so they are available in sufficient quantities during the clinic (Figure 1). Temperature-controlled vaccine coolers were used to store immunizations, and temperatures were monitored with downloadable data-logging thermometers.[5,6]

Figure 1. Vaccine storage containers.
Picture credit: www.vericormed.com

We developed standardized vaccine ordering nursing protocols through the EPIC system. Nurses used laptops to document vaccines in the EPIC health record, then transferred the immunization data to the state immunization registry through an electronic interface.[8,9]

The Drive-Through flow was as follows:

1) The vehicle arrived at the drive-through.
2) Nurse or registration staff greeted the parents, completed a COVID-19 Screening, and instructed them to pull into the tent or behind the current vehicle.
3) Registration staff members verified the patient information and registered the patient using a laptop.
4) All the staff and nurses staffing the Drive Through clinic wore appropriate personal protective equipment (PPE),
5) The nurse obtained the patient's temperature, provided patient education packets, and reviewed vaccines currently due.
6) The nurse checked the immunization record, prepared, and administered the vaccines. A second nurse was available to help hold patients as needed for safety.
7) Exam beds and chairs were available for those who preferred not to remain in their vehicles.
8) Stickers and toys were given to the patient after the injection.
9) The parent was instructed to drive to a waiting area in the parking lot and remain there for 15 minutes after the injection. They could leave on their own after 15 minutes if there were no concerns.
10) A safe, designated area was available for patients to play with bubbles, sidewalk chalk, and hula hoops during the 15-minute wait time.
11) Parents completed a patient satisfaction survey on iPads during their 15-minute wait time.
12) Nurses documented all information in EPIC, including patient temperature, vaccines administered, and (VFC) eligibility screening.

Results

The Drive-Through Immunization Station provided 745 vaccines to 415 patients between April 21 and September 25, 2020.

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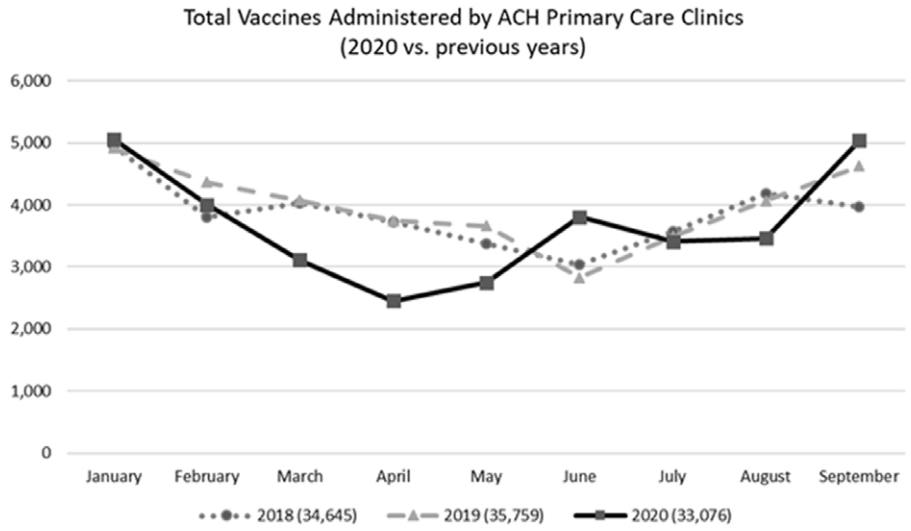

Figure 2. Total vaccines administered.

The appointments were paused between July 3 and August 14 due to the summertime heat and temperatures in the 90s. During that pause, the metal drive-through structure was removed and replaced with a tent that reflects heat, and an outdoor air conditioning system. These improvements in the design improved the working conditions for the nursing staff, and the appointments were restarted on August 1 to allow for back-to-school vaccines to be administered. Starting on September 25, flu vaccines were also administered at the drive-through.

The Total Number of Vaccinations Compared to Previous Years

The total number of vaccines administered at Arkansas Children's Primary Care clinics was at a 3 year high in January 2020, with 5056 vaccines administered. That number declined between February and April 2020 to a low value of 2455 vaccines administered in April, 2020. The Drive-Through started on April 21. The number of vaccines administered began to increase in May. In June 2020, the number of vaccines surpassed the previous 2 years, with 3808 vaccines administered. During July and August 2020, the vaccines administered declined compared to the last 2 years due to the pause in the Drive-Through clinic. Once the drive-through clinic was restarted after making improvements in the structure, by September 2020, the number of vaccines administered increased to 5033. It surpassed the number of vaccines administered compared to the same month the previous 2 years (Figure 2).

Wait Times

Wait times in minutes from patient arrival to completion of vaccine administration for shot-only appointments at regular clinic locations (Mdn = 17, Interquartile range (IQR) = 12-27) were longer than those seen at the drive-through site (Mdn = 5, IQR = 4-7). A Mann-Whitney U test indicated that this difference was statistically significant, U ($N_{\text{regular clinic}} = 21$, $N_{\text{drive-through}} = 21$) = 14.5, z = 5.18, $P < 0.001$ (Figure 3, Table 1).

Family and Patient Satisfaction

Patient and parent feedback was positive. During the first 2 weeks of operation, 27 parents completed the patient experience surveys. The survey questions addressed safety, convenience, patient

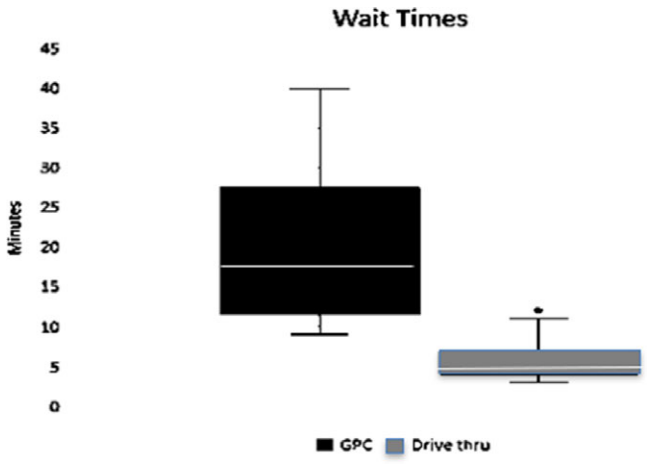

Figure 3. Wait times.

comfort, and the likelihood of recommending the service to family and friends. All responses were positive (Table 2).

Patient experience responses were positive, as mentioned on the patient experience survey. Feedback comments included:

- "This was a wonderful and convenient experience. The staff was very nice and professional."
- "The Drive-through service is very convenient and does not take long at all. The services we received were great."
- "Should keep this going for the future!"
- "Neat experience, and kids loved the bubbles. The process was quick. Great idea and way to continue to provide for children's needs."

Discussion

Vaccines are the most successful scientific and evidence-based inventions of the century. This pandemic posed a significant threat to public health like never seen before, especially in preventing pediatric infectious diseases as the rate of pediatric vaccination declined nationwide. The Drive Through clinic established a means to help mitigate this threat. Our extensive literature search

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Table 1. Wait times in minutes

	GPC	Drive Through
Count	21	21
Min	9	3
Max	40	12
Median	17	5
Std dev	9.57	2.77

Table 2. Satisfaction survey

		No	Yes, Somewhat	Yes, Mostly	Yes Definitely
Q1	Do you have confidence and trust in the safety of this service?	0	1	2	24
Q2	Was this service convenient for you?	0	0	0	27
Q3	Did the team try to help your child feel comfortable and at ease during and after the injections?	0	1	3	23
Q4	Did you and your child feel comfortable and safe in the Drive-through environment?	0	0	1	26

did not yield any hits on mass vaccination clinics for routine pediatric vaccines. Many mass influenza vaccine clinics have been a success.[4,9] This novel clinic helped establish a possible solution in administering routine pediatric vaccines. We believe this was the first clinic of its kind to be started in the country. Routinely, pediatricians find that the traditional Well-Child visits are scary to the patients due to vaccine anticipation in an unfamiliar environment. The ease and safety of vaccine administration made the Drive-Through process easier for nurses and caregivers. It helped decrease patient distress due to familiarity with the surrounding. The patients seemed to enjoy playing with bubbles, hula hoops, and sidewalk chalk while waiting after the vaccines, which cannot be achieved in a traditional setting. The parents and children enjoyed the ease of not getting out of their vehicle and the efficient experience, as evidenced by the feedback we received from parents. All the above factors contributed to alleviating the anxiety of vaccines and exposure to the disease, which was one of the most significant barriers.

The Drive-Through Clinic pilot was very successful. All measured outcomes improved, including wait time, positive patient experience, and the number of vaccines administered. The total primary care clinic immunization counts for June, 2020 were 3793 compared to 2826 vaccines administered in June, 2019. A significant increase in the number of vaccines after establishing the Drive-Through clinic was a vital sign of the success of this program.

The median wait time for patients in the Drive-Through clinic was 5 minutes compared to 17 minutes in regular shot-only clinics. The traditional visit measurement does not consider the additional time involved in parking and entering the building, which would significantly increase that time, making the difference even more remarkable. Registration in the Drive-Through Clinic took place simultaneously as vaccine preparation as soon as the patient arrived and patient identity was verified. Patients could always remain in the vehicle during vaccine administration.

Decreased wait times also seemed to reduce patient anxiety, as mentioned by parents in the survey results, but further studies are needed to study this added benefit.

Since the average time involved from arrival to vaccine administration was 5 minutes, we could see a larger volume of patients than during traditional shot-only visits, especially with increased distancing and disinfection protocols in the clinic. We were thus able to improve the vaccine administration rate when most vaccinations were being postponed or delayed.

The data presented are from a pilot to provide these services to a selected pediatric population (pediatric patients with a PCP at ACH). This data alone, though robust for initial implementation, does not represent a varied population of children. Further demographic analysis of the at-risk pediatric population is needed to enhance outreach efforts. The ease and comfort of this approach may be helpful in the future to extend other need-based services, e.g., dental hygiene education and other injury prevention services, along with vaccinations. There is a need for more surveys and studies in this area.

This pilot afforded a new venue to innovate and focus on disaster preparedness training for our nursing staff for the future. We learned many lessons concerning the flow of the drive-through clinic, staffing, approach to establishing a temperature-controlled structure for the clinic, scheduling of patients, and traffic control. We made considerable improvements in scheduling and the flow of the clinic as the clinic got busier than when we started the clinic initially. The registration process was made more user-friendly; parents were given a number to call for registration when waiting in line. This process decreased 1 step for our staff and moved the lines faster by managing the traffic to the clinic. The pilot gave us an idea of needed resources for future projects and efficiently conducted these alternative delivery methods while providing the best patient experience.

Conclusion

In a global pandemic, we must prioritize innovative ideas to increase access to preventive healthcare to prevent further stress on the economy and healthcare already dealing with a pandemic.[9,10]

In a short span of 5 months, the Drive-Through Clinic has proved to be an effective way of delivering vaccines to the pediatric population in our area. We were able to accomplish all the goals that we set forth at the beginning of the project.

This program at Arkansas Children's hospital became very popular and, since inception, has guided other pediatric clinics in Arkansas and outside of Arkansas to set up Drive-Through clinics. Experience and knowledge gained with implementing the Drive-Through Clinic during this time will better prepare us for future disaster preparedness efforts. We plan to use this method as needed in the future for mass Covid-19 vaccination.

This method of nontraditional vaccine administration can also be used to improve outreach efforts to underserved populations in our communities in the future.

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