A Medical Student-Driven “Vaccine Blitz” at a School-Based Health Center as an Effective Way to Improve Adolescent Vaccination Rates

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BACKGROUND AND OBJECTIVES: Adolescent vaccine rates are below goal in the United States. We sought to assess a medical student driven “vaccine blitz” at a middle school with a school-based health center (SBHC) as a means to increase vaccination.

METHODS: Written and/or verbal consent was obtained for specific vaccines needed. Vaccines were given at the SBHC by a team of medical students, public health students, and SBHC staff. Students who received vaccines at the SBHC or primary care physician’s (PCP’s) office in the 3 weeks after consent was attempted were included as participating in the intervention.

RESULTS: Of 184 potential participants, 183 lacked at least one vaccine. On the day of the vaccine blitz, 48 students were given 94 vaccines. During the entire intervention time, an additional 14 students received 38 vaccines at the SBHC, and 23 students received 34 vaccines from their PCP. In sum, 85 students received 166 vaccines from this intervention. Immunization rates increased above the state average for all recommended vaccines; rates of HPV, hepatitis A, and influenza vaccination were most affected.

CONCLUSIONS: Medical student-driven vaccine blitzes within an SBHC are a feasible, replicable, and effective way to increase adolescent vaccination rates. In addition, the blitz provided preclinical medical students’ exposure to underserved populations, adolescent health as part of the breadth of family medicine, SBHCs, and community medicine and allowed for multidisciplinary work between medical students, public health students, physicians, and nurse practitioners.

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Michigan Medical Internal Review Board. Scarlett Middle School is home to 515 students divided fairly evenly between sixth, seventh, and eighth grade, of which 34% identify as non-Hispanic whites, 34% as black, 13% as Hispanic, 12% as more than two races, and 7% as Asian/Pacific Islander. The project population consisted of 184 students (35.7% of the entire student population) whose guardians had previously consented for general care at the SBHC. A spreadsheet was created listing each eligible student and their vaccine status for the standard childhood and adolescent vaccines as determined by the Michigan Care Improvement Registry (a state-run health and vaccine registry).

**Consent**

A brief educational exercise about the importance of vaccines was presented by teachers to all middle school students during homeroom. Students who had a standing consent for care at RAHS and were due for one or more vaccines (n=183/184, 99.5%) were then sent home with the Centers for Disease Control and Prevention teen vaccine handout (encouraging recommended vaccines), relevant Vaccine Information Statements, and a personalized consent form for their parents to review, sign, and return within 2 weeks.

For those patients for whom written consent was not returned, verbal consent was attempted in the evening by a team of bilingual medical and SPH students. A phone script was used that described the benefits of vaccines and contained answers to frequently asked questions about vaccines. Parents with additional questions were given the opportunity to speak with a medical professional. Parents who did not want to have their child vaccinated at the blitz were advised to schedule an appointment with their primary care provider (PCP) to obtain vaccines. If a parent did not answer, a voicemail was left, and an additional call was attempted 2 days later.

**Administration of Vaccines**

A collaborative team of medical students, public health students, physicians, and RAHS nurse practitioners and medical assistants was assembled to vaccinate all consenting students during a school day. Students were called down to the school clinic area in groups and vaccinated by medical students under the supervision of RAHS staff or physicians. Students who missed the vaccine blitz day were called to the clinic on a subsequent day and vaccinated by clinic staff. Insurance was billed for patients with insurance coverage for vaccines (45% of patients); uninsured and underinsured patients (55% of patients) were given vaccines from Vaccines For Children (VFC) so there was no out of pocket cost for blitz participants.

**Results**

Of the 184 students eligible for participation, only one (0.5%) was completely up to date on all recommended vaccines at baseline. Written consent was returned by 20 (10.9%) students. Verbal consent was then obtained for an additional 42 (22.8%) students. Sixty-six (35.9%) parents who did not return the written consent were unable to be reached by phone, and 55 (29.9%) declined participation. The primary reasons given by parents for vaccine declination were that the parent preferred vaccination at the PCP's office, or they declined any vaccine not mandated by the school. See Table 1.

We defined a broader time frame for the intervention as a whole—beginning when the written consents went home and ending 3 weeks after the blitz day to account for students who came in immediately when realizing vaccines were due and students who missed the blitz day but still initiated vaccination at RAHS or at

<table>
<thead>
<tr>
<th>Immunization Type (n of students due)</th>
<th>Given by RAHS</th>
<th>Given by PCP</th>
<th>Total Vaccinations Given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A* (82)</td>
<td>26</td>
<td>3</td>
<td>29</td>
</tr>
<tr>
<td>Hepatitis B (1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Human Papilloma Virus (HPV)* Females (82)</td>
<td>26</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>Males (91)</td>
<td>27</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>Influenza (121)*</td>
<td>30</td>
<td>9</td>
<td>39</td>
</tr>
<tr>
<td>Meningococcal (MCV4) (21)</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Measles Mumps Rubella (MMR) (2)</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Polio (1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tetanus Diphtheria acellular Pertussis (TDaP) (17)</td>
<td>8</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Varicella (8)</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

* Regional Alliance for Healthy Schools school-based health center
* Primary care provider
* Vaccines not mandated for school attendance
Figure 1: Immunization Rates for Scarlett Middle School Students Who Have Consent to Utilize the School-Based Health Center Pre-Vaccine Blitz and in Comparison to Michigan’s Average Immunization Completion Rates

* Michigan average vaccination rates for 11–14 year olds gathered from the Michigan Care Improvement Registry data as of January 2014

** Patients who received one or more doses of these vaccine series

their PCP’s office. On the day of the vaccine blitz, 48 students were given 94 vaccines. During the entire intervention time, an additional 14 students received 38 vaccines at RAHS, and 23 students received 34 vaccines from their PCP (Table 1). In sum, 85 students received 166 vaccines from this intervention. A comparison of pre-blitz immunization rates, post-blitz immunization rates, and Michigan’s average immunization rates can be seen in Figure 1. Immunization rates increased above the state average for all recommended vaccines.

Discussion
This medical student-driven vaccine blitz successfully increased vaccination rates, particularly for those vaccines not required for school attendance (HPV, flu, and hepatitis A). In addition to increasing numbers of students receiving vaccines at the SBHC, many patients were prompted to see their PCP for a visit potentially reconnecting adolescents with their medical home. We found that using a combination of personalized written and verbal consent for the specific vaccines the adolescent was due for was most successful. Using volunteer student “manpower” from both medical and public health programs increased the capacity of the SBHC to run this large-scale blitz.

There are a number of limitations to this intervention. This blitz model requires an SBHC in addition to access to students from professional schools, and this combination is not always available. Despite attempts to contact families both in writing and by phone, it was still difficult to reach many parents to obtain consent, and this limited the numbers of vaccines given. Finally, the blitz model gives vaccines due at a single point in time and is not designed to provide subsequent vaccinations of a series (such as HPV).

There were many peripheral benefits to this event. Preclinical medical students were exposed to medically underserved populations and adolescent health as part of the breadth of family medicine, SBHCs, and community medicine. It allowed for multidisciplinary work between medical students, public health students, physicians, and nurse practitioners. Finally, it provided Scarlett Middle School students an opportunity to spend time with medical students, potential role models, and mentors. This vaccine blitz is easily replicable at other institutions, and is a feasible route for increasing adolescent vaccination rates.

References