Influenza Adherence Tool Kit

Implementation and evaluation among allogeneic hematopoietic transplantation recipients

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BACKGROUND: Allogeneic transplantation is associated with significant complications, such as influenza, a common virus in the post-transplantation setting that can be detrimental to patients. Therefore, patients should adhere to influenza vaccinations.

OBJECTIVES: The objectives of this project were to improve influenza adherence rates from 2015–2016, to increase transplantation recipients’ knowledge of the importance of vaccination, and to evaluate the barriers to and facilitators of adherence rates to influenza vaccinations.

METHODS: A pre-/postscreening survey was used, as well as a tool kit with an education pamphlet and financial incentive, and a reminder letter.

FINDINGS: Forty-eight eligible patients participated in the study, and 32 completed the prescreening questionnaire. The adherence rate for the 2015–2016 influenza season improved compared to the baseline vaccination rate. The findings revealed a strong association between provider recommendation and vaccination adherence.

KEYWORDS
influenza vaccination; tool kit; vaccination adherence; provider referrals

DIGITAL OBJECT IDENTIFIER
10.1188/17.CJON.339-344
withheld vaccinations, including the influenza vaccine, if they felt recipients had active GVHD or were too ill (Ariza-Heredia et al., 2014). Although the study did not explore patients’ attitudes and knowledge, it revealed why variations exist among practices.

Financial factors play a role in vaccination adherence rates (Stone et al., 2002). For many patients, insurance policies require that influenza vaccines be received in primary care settings, not in hospital transplantation clinics. Therefore, patients must schedule and pay for separate immunization visits. Stone et al. (2002) recommended using a five-pronged approach to increasing immunization adherence, including education, financial incentives, national action, organization or infrastructure change, and media campaigns. This approach includes patient and provider incentives, educational initiatives, and reminders.

Vinograd et al. (2014) reported a 48% compliance rate to influenza vaccinations in adults with cancer. Pretreatment vaccination compliance predicted patient compliance during chemotherapy (Vinograd et al., 2014). Physicians’ recommendation of vaccines was a strong predictor of patient adherence (Vinograd et al., 2014). One way to increase vaccination adherence is to improve recipients’ knowledge about the influenza virus and vaccination safety (Bishop et al., 2010; Ferguson et al., 2010; Stone et al., 2002). Educational sessions were an effective strategy to increase patient knowledge of the influenza virus and household vaccination rates by 41% (Ferguson et al., 2010). One study on vaccination adherence in transplantation recipients showed that mail and telephone reminders were successful in increasing vaccination adherence (Lerchenfeldt et al., 2013).

Patient determinants, such as age, marital status, gender, and ethnicity, may affect vaccination compliance (Nagata et al., 2013; Vinograd et al., 2014). One observational study of 800 patients with cancer revealed that the most common predictive factors were previous vaccination experience and physician recommendation (Vinograd et al., 2014). Another study of older adults revealed that certain social determinants are predictive of higher rates of vaccination adherence, such as marriage and higher education, as well as older age and female gender (Nagata et al., 2013). Conversely, socioeconomic status does not always correlate with vaccination compliance (Nagata et al., 2013).

**Practice Improvement Project**

The adherence rate to the influenza vaccination at Rutger’s Cancer Institute of New Jersey, a National Cancer Institute (NCI)–designated cancer center, is 63%. Anecdotal reports at the Cancer Institute showed that vaccine adherence was influenced by patients’ previous vaccination ideals, education, and financial constraints. The Cancer Institute’s allogeneic stem cell transplantation program strives to offer comprehensive care to patients, improving post-transplantation outcomes and quality of life. The goals of the current project are to (a) improve influenza adherence rates in

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**“Participants noted that provider recommendation of vaccination was very important in decision making.”**

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**FIGURE 1.**

**INFLUENZA TOPICS ASSESSED IN THE BROCHURE AND SURVEYS**

**BROCHURE**
- How influenza is contracted
- How long the influenza virus is considered contagious
- Symptoms of the influenza virus
- Why the influenza virus is important in the transplantation setting
- Safety of the influenza vaccination
- When a transplantation recipient is eligible for the influenza vaccine

**PREScreening Survey**
- Knowledge about influenza virus
- Likelihood of getting the influenza vaccine
- Perceived importance of the influenza vaccine
- Knowledge about when the vaccination can be given to post-transplantation recipients
- Knowledge about the safety of the influenza vaccination
- Participant’s willingness to receive the influenza vaccination
- Knowledge of family member’s willingness to receive the vaccination
- If a provider has recommended the influenza vaccination
- Level of feeling informed regarding the influenza vaccination

**POSTscreening Survey**
- If the participant has received the influenza vaccination
- Knowledge about the influenza virus
- Knowledge about when the vaccination can be given to post-transplantation recipients
- Knowledge about the safety of the influenza vaccination
- Participant’s willingness to receive the influenza vaccination
- Knowledge of family member’s willingness to receive the vaccination
- If a provider has recommended the influenza vaccination
- Level of concern about side effects of influenza vaccination
- Facilitators of receiving the influenza vaccination
- Barriers to receiving the influenza vaccination
the 2015–2016 influenza season by at least 10% with a tool kit, (b) increase allogeneic stem cell recipients’ knowledge of the importance of influenza vaccinations with an educational pamphlet, and (c) evaluate the barriers and facilitators that affect adherence rates to influenza vaccination.

Methods
Rutger’s Cancer Institute of New Jersey is the only NCI-designated center in the state. The Cancer Institute provides comprehensive care to a diverse population and offer medical, surgical, and radiation oncology services. The blood and marrow transplantation group sees about 125 transplantations per year, including autologous and allogeneic stem cell transplantations. Diseases treated with allogeneic bone marrow transplantation include acute leukemia, chronic leukemia, relapsed lymphoma, and multiple myeloma. This program has grown by 20% since 2015, and the growth is projected to continue. The blood and marrow transplantation program is accredited by the Foundation of Cellular Therapy.

Sample
This study was implemented at the Cancer Institute for post allogeneic hematopoietic recipients who were eligible for the influenza vaccination in the 2015–2016 influenza season. Participants who were allergic to the influenza vaccination or who had already received it were excluded from project data. Adult recipients who were six months to three years post-transplantation and eligible to get the vaccination were asked to participate. This project received institutional review board approval from Rutger’s Cancer Institute of New Jersey and Duke University. Thirty-two participants consented and completed the prescreening process, and 27 participants completed the postintervention survey.

A pre-/post-test was used to determine patient knowledge and vaccination adherence rates in this mixed-method study. The principal investigator (PI) identified participants to include based on the date of their transplantation listed on a patient spreadsheet. A three-pronged approach was used to meet the project goals: a pre- and postintervention assessment; the tool kit, which included a prescreening survey; infection prevention aids, such as masks and hand sanitizer; an influenza education pamphlet; and a coupon for an influenza shot at a pharmacy nearby.

At the screening clinic visit, the PI approached the patients to recruit and obtain consent. After signing a consent form and agreeing to participate, the patients received a prescreening

<table>
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<tr>
<th>TABLE 1. SAMPLE CHARACTERISTICS (N = 32)</th>
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<td>CHARACTERISTIC</td>
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<td>Gender</td>
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<td>Male</td>
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<td>Age (years)</td>
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<td>56–65</td>
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<td>Older than 65</td>
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<td>Race</td>
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<td>Asian</td>
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<td>Unrelated</td>
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<td>Related</td>
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<td>Other</td>
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survey and tool kit. Participants received a pharmacy voucher as incentive, which provided co-payment assistance and points toward future purchases. Participants then either used the voucher to receive a influenza vaccination or went to their primary care provider to receive the vaccination.

About one month after receiving the screening survey and tool kit, all eligible patients were sent a follow-up mailing reminder to reinforce the need to receive an influenza vaccination. In January 2016, at a scheduled patient visit, participants were given the postintervention surveys to complete. The survey had a five-point Likert-type scale with 10 questions, and included a self-report of influenza vaccination adherence, knowledge-based questions, and open-ended questions regarding barriers to and facilitators of influenza vaccination adherence. The survey was validated by a panel of experts.

Data Analysis
Data were entered into SPSS® software for statistical analysis. Demographics were presented as descriptive statistics, and project outcomes of the pre- and postintervention groups were compared using chi-square tests. The alpha was set at p ≤ 0.05.

Results
Data of all eligible participants were collected from September 2015 to January 2016. The project included 48 eligible patients, and 32 completed the prescreening questionnaire (67%). Fourteen patients were ineligible for the project because they had already received the influenza vaccine. Two individuals chose not to participate. The postintervention survey was completed by 27 of 32 participants (84%). Four participants either died or were too ill to complete the project; one participant declined to complete the postscreening survey.

Demographics
Demographic data included age, race, marital status, gender, and type of transplantation, and was gathered through EHR chart review. Age of participants ranged from 25 years to older than 65 years, with the highest percentage of patients aged 56–64 years. Most participants were Caucasian, but Hispanic, Asian, and African American participants also participated. The sample was representative of the bone marrow transplantation patient population at Rutger’s Cancer Institute in New Jersey. Most participants received unrelated transplantations, and the majority was married. Chi-square testing was performed for gender, vaccination adherence, marital status, and no correlation was found. See Table 1 for more demographic data.

Aim 1: Improve Vaccination Adherence Rates
The results showed an overall adherence rate of 89% from 2015–2016. The preintervention adherence to the influenza vaccination for 2014–2015 was 63%. An increase in vaccination adherence of 41% occurred from 2014–2015. Of 24 patients who were recommended to receive the influenza shot, 23 received it (96%, Fisher’s exact p = 0.009).

Aim 2: Increase Knowledge and Improve Attitudes
Patient knowledge was assessed pre- and postintervention with two questions: when the influenza shot is recommended in the transplantation setting and how the influenza virus is spread. Attitudes about the influenza shot were assessed by asking the participants the likelihood of them receiving the vaccination, the importance of getting it, how informed they were about complications of the influenza virus, safety of the vaccination, worry related to the side effects, and the likelihood of family members receiving it. Although knowledge and attitudes did not change significantly from pre- to postintervention, six of the nine (67%) participants who did not receive the vaccination preintervention received it postintervention.

Aim 3: Evaluate Barriers to and Facilitators of Adherence
Barriers and facilitators of receiving the influenza vaccine were explored with open-ended questions in the postscreening survey (see Table 2). Barriers and facilitators were noted on the postscreening survey by 16 of 27 respondents (59%). Several themes emerged from the qualitative data, such as the importance of provider recommendation of receiving an influenza vaccination, education about the influenza virus and vaccination, access to and cost of vaccinations, side effects, safety in the transplantation setting, timing of the vaccination, fear of getting the virus, and effect on the immune system. One participant did not receive the influenza vaccination because of the “complications/side effects

<table>
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<th>TABLE 2. THEMES REGARDING THE BARRIERS TO AND FACILITATORS OF RECEIVING THE INFLUENZA VACCINATION (N = 16)</th>
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<td><strong>THEME</strong></td>
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<tr>
<td>Provider recommendation</td>
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<td>Fear of influenza virus</td>
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<td>Influenza education</td>
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<td>Side effects</td>
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<td>Access/cost</td>
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<td>Immune system boost</td>
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<td>Vaccination safety</td>
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<td>Timing</td>
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*Note.* Participants could select more than one theme.
that you hear about the vaccination, including . . . actually getting the flu.” Another respondent felt that a facilitator of getting the vaccination was “doctor’s order.”

Discussion
The vaccination adherence rate increased from 63% in 2014 to 89% in 2015, meeting the study aim. This demonstrates that the authors’ approach of using an influenza tool kit and mailing reminders can improve adherence rates in the transplantation setting. Knowledge and attitudes did not change significantly before and after the intervention, but a positive trend in improved knowledge regarding the influenza vaccination was observed. In addition, this study provided the opportunity to obtain patient perspectives on barriers to and facilitators of the influenza vaccination. Unlike the findings of Nagata et al. (2013), gender and marital status did not affect patient adherence to the influenza vaccination.

The association of provider recommendations and influenza vaccination adherence rate was statistically significant in this study, as in other studies (Vinograd et al., 2014). In addition, the current authors found that provider recommendation is a strong predictor of patient adherence to vaccinations, which has also been found in other studies (Vinograd et al., 2014). The current findings supported the notion that follow-up reminders and discussion can increase adherence rates to the influenza vaccination among patients (Lerchenfeldt et al., 2013). The knowledge and attitudes of participants did not change significantly. However, they appeared to be headed in a positive direction. Knowledge may not be a major barrier to obtaining the influenza vaccination. Improving access to vaccinations with coupons and schedule reminders may have been the most effective components of the intervention. Ten of 32 participants who completed the preintervention surveys used the pharmacy coupon (31%). Vaccination adherence of these participants was confirmed by pharmacy staff. Sixty-nine percent of participants received the influenza vaccination at their primary care physician’s office or at a local pharmacy.

Limitations
The small sample size and single study site were major limitations of this pilot study. The project was time-sensitive, and some participants received the influenza vaccination early, which resulted in 14 patients not meeting eligibility criteria to participate. Four participants did not complete the study because of death or illness. The survey was designed by clinicians at the authors’ institution and had only content validity. Although this approach proved efficacious in the transplantation setting, it may not be generalizable to other oncology settings. EHR records were inconsistent for documenting individual influenza vaccination. Some participants used the financial incentive, so authors were able to confirm adherence. However, a subset of patients did not use the financial incentive, so adherence in these instances was confirmed by self-report.

Implications for Nursing
Based on the authors’ experiences with this study, they recommend (a) annual provider education, (b) improving influenza patient education by incorporating vaccination content into education classes pretransplantation, (c) improving EHR documentation, and (d) starting influenza vaccination studies in the late summer to include participants who receive early vaccinations. During data collection, documentation for the influenza vaccination was inconsistent. Using the results of this project, the authors adapted the EHR record to require influenza vaccination documentation every year. They recommend continued use of mail reminders and patient portal reminders. Other important considerations include outreach calls, development of nursing screening tools, physical and advanced practice provider education, and using EHR to assist adherence (Azira-Heredia et al., 2014).

Conclusion
Despite the current influenza vaccination recommendation, adherence to the vaccination in the transplantation setting remains inconsistent. They authors’ strategy included providing patient education, sending reminder cards, and removing financial barriers, which improved vaccination rates in patients six months to three years after allogeneic transplantation. Evaluation data demonstrated that adherence increased to 89%. Patient knowledge and attitudes improved, but not significantly. The findings supported the strong correlation between provider recommendation and patient adherence to receiving the influenza vaccination. Participants noted that provider recommendation of vaccination was very important in decision making. Approaches to vaccination adherence in the transplantation setting need to be explored using EHRs, education of providers, and innovative strategies to improve vaccination adherence rates.

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The authors take full responsibility for this content. Krimmel has previously received payment for lectures, including services on speakers bureaus, from Novartis and Celgene, and fees for participation in advisory or review activities from Novartis. Bannerji has received research support from the National Institutes of Health, the Leukemia and Lymphoma Society, and the American Cancer Society.

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VOLUME 21, NUMBER 3
CLINICAL JOURNAL OF ONCOLOGY NURSING 343
funding from Abbvie, Genentech, Gilead, Pharmacyclics, Medimmune, and Regeneron. The article has been reviewed by independent peer reviewers to ensure that it is objective and free from bias.

REFERENCES


