

Patient Safety in a Complex Immunization Process: Error-proofing Interventions Implemented at the University of Louisville Refugee Immunization Program

Carey Ackerman BA, Ruth Carrico PhD RN, Yvette Ineza MPH, Anne Harrell MPH, Tom Boeshart MPH, Rebecca Ford MPH, Kelly Westhusing MPH CPH, Rob Kelley PhD, Tim Wiemken PhD, Paula Peyrani MD.

Division of Infectious Diseases, Department of Medicine, University of Louisville School of Medicine. Louisville, Kentucky

ABSTRACT

Each year, more than 1200 refugees are resettled in the Louisville area. One important aspect of the resettlement process is ensuring protection of the refugees and the community against vaccine-preventable diseases¹. Providing vaccines to a multicultural, multilingual population is complex and error-prone. The objective was to design and implement an immunization program consisting of multiple safeguards. The project team developed a multistep process that included use of: 1) demographic and relevant health information; 2) standardized questions and translated scripts; 3) individualized immunization schedules²; 4) strict vaccine administration processes; 5) safe injection practices³; 6) a training program for personnel administering vaccines; 7) vaccine cold chain assurance; and 8) emergency response procedures. From October 2012 through August 2013, more than 5000 doses of vaccine were administered to 1153 adult refugees representing 34 different nationalities speaking eighteen languages. Error-proofing prevented: 1) unnecessary varicella immunization of 581; 2) inappropriate administration of MMR vaccine in 15 pregnant women; and 3) contraindicated influenza vaccine in one. Surveillance identified four errors: 1) three refugees immune to varicella were immunized and one was given Td instead of tdap. Five “near misses” were identified including late administration of vaccine, misidentification of two refugees with the same name, and two missed doses of vaccine. Preventing errors in a complex process requires attention to detail, pilot testing of activities, and active surveillance for error and near miss events. The processes developed for this program represent a model that can be implemented in other communities.

INTRODUCTION

Each year, more than 1200 refugees are resettled in the Louisville area as part of the federal government refugee resettlement program. One important aspect of the resettlement process is ensuring protection of the refugees and the community against vaccine-preventable diseases. Therefore, an important component of the resettlement process involves adherence with recommendations from the Centers for Disease Control and Prevention concerning the vaccines that each refugee should receive in preparation for their adjustment of status from refugee to US citizen. These recommended age-appropriate vaccines for adults include the 3-dose tetanus series, 2-dose MMR and varicella series, influenza, and pneumococcal vaccines. Providing these vaccines in a manner that is safe as well as efficient requires attention to a process that incorporates error prevention.

MATERIALS AND METHODS

The project team from the UL Division of Infectious Diseases (UL-ID) developed a process using the following procedural steps:

- 1) gather demographic and relevant health information of the adult refugees being resettled in Louisville, Kentucky;
- 2) use a standardized series of questions regarding the refugees’ health status at the time of vaccination and provide that information using scripts that have been translated and tested for cultural sensitivity (**Image 1**);
- 3) craft an individualized “Vaccine Trip Tik” that outlines an immunization schedule for each refugee;
- 4) develop a vaccine administration process that prevents incorrect vaccine selection and administration (**Image 2**);
- 5) incorporate safe injection practices as a safety measure for recipients and administering healthcare personnel (**Image 3**);
- 6) develop a training program for healthcare personnel involved in vaccine administration;
- 7) develop a process for ensuring the vaccine cold chain (**Image 4**);
- 8) outline emergency response procedures; and
- 9) weave elements of infection prevention and control throughout the vaccine preparation, administration, and waste disposal process. All steps were pilot tested before implementation.



Image 1. Interpreters and language line access

MATERIALS AND METHODS, CONTINUED



Image 2. Vaccine separation, injection site standardization, Immunization station standardization, patient positioning, personnel training

RESULTS

From October 2012 through August 2013, more than 5000 doses of vaccine were administered to 1153 adult refugees by UL-ID project personnel.

Those refugees receiving vaccination represented 34 different nationalities and required interpreting of information in eighteen languages.

Use of available health information prevented:

- 1) unnecessary varicella immunization of 581 refugees;
- 2) inappropriate administration of MMR vaccine in 15 pregnant women; and
- 3) contraindicated influenza vaccine in one refugee

Despite error-proofing procedures, there were four errors identified. Three refugees immune to varicella were immunized with the varicella vaccine and one refugee was given Td instead of tdap.

In addition, there were five “near miss” errors including late administration of vaccine, misidentification of two refugees with the same name, and two missed doses of varicella vaccine for one refugee.

There have been no reported sharps injuries among the administering healthcare personnel and no identified infection prevention and control misadventures.

RESULTS, CONTINUED



Image 3. Safe injection practices



Image 4. Vaccine cold chain management

CONCLUSIONS

Preventing mistakes and errors in a complex process requires attention to detail, pilot testing of activities, and active surveillance for error and near miss events. Ensuring that all involved personnel are adequately trained, spending time to investigate health records of the refugees prior to the immunization clinic, pilot testing of process steps, and real-time error surveillance are essential elements for a safe and effective program. The processes developed for this refugee immunization program represent a model program that can be implemented in other communities.

REFERENCES

- 1.Centers for Disease Control and Prevention Division of Global Migration and Quarantine (2012). Guidelines for the U.S. Domestic Medical Examination for Newly Arriving Refugees. Accessed September 15, 2013.
- 2.CDC. Vaccine Storage and Handling Guide 2011.. Accessed September 15, 2013.
3. CDC. 2007 Guideline for Isolation Precautions. Preventing Transmission of Infectious Agents in Healthcare Settings. Accessed September 15, 2013.

ACKNOWLEDGEMENTS

We appreciate the opportunity to partner with the Kentucky Office of Refugees and Catholic Charities in an effort to provide vaccines to this vulnerable, yet resilient, population. We also appreciate the assistance of University of Louisville, Bellarmine and Spalding University Schools of Nursing for their error-proofing ideas and evaluation.