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Increasing Pertussis and Influenza Vaccinations Rates Among Postpartum Women

Susan R. Lesser, MSN, RN-BC [a,*], Adi Ginzburg, MD [b], Susan Wootton, MD [b]

[a] Children's Memorial Hermann Hospital, Houston, TX
[b] The University of Texas, Health Science Center at Houston, Houston, TX

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ABSTRACT

Multiple organizations have recommended cocooning—vaccination of household contacts of infants' age less than 12 months—against influenza and pertussis, however logistical and financial barriers have precluded widespread implementation of cocooning at a national level. This project included postpartum mothers of infants admitted to the low risk nursery or NICU who were eligible to receive influenza vaccination and/or pertussis vaccination. Our goal was to increase maternal postpartum vaccination rates against influenza from 50% in November 2013 to 90% by March 2014 and against pertussis from less than 5% in November 2013 to 90% by May 2014. Our project had minimal impact on influenza vaccinations rates (decreased from 40 to 24%) but significant impact on pertussis vaccination rates (increased from < 5% to 61%). This article describes the partially successful implementation of a postpartum cocooning program at Children's Memorial Hermann Hospital (CMHH) in Houston, Texas.

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Background

For many years, multiple organizations (CDC, ACOG and ACIP) have recommended cocooning – vaccinating household contacts of infants' age less than a year – against influenza and pertussis. Immunization rates for these vaccines are suboptimal, leaving many pregnant women and their infants unprotected against these serious vaccine-preventable diseases.

Pregnant women and their babies are at increased risk for influenza- and pertussis-related complications.[1] Pertussis outbreaks continue to occur in the United States with infants at highest risk of severe illness, including hospitalization and death.[2]

Household contacts (80%), specifically mothers (30–40%), are the most common identified source of pertussis in infants. Additionally, other infant contacts including brothers, sisters, grandparents and caregivers could be sources of infection.[3]

Prior to our intervention, Tdap vaccination rates of eligible mothers were less than 5% and Influenza vaccinations rates were ~35%. In September 2013, we initiated our cocooning project to increase vaccination rates of eligible postpartum mothers using a variety of QI methods.

Methods and Interventions

Initial steps included stakeholder meetings, process mapping, creation of fishbone diagrams to identify barriers, and evaluation of measurement systems. Multiple stakeholders including physicians, nurses, pharmacists, administrators and patients from the pediatric, obstetric, neonatal and bioinformatics departments were convened to 1) create awareness, 2) identify barriers, 3) document the voice of the customer and 4) identify appropriate metrics. Subsequently, goals were focused to address Tdap and influenza vaccination rates. During this time period we had bi-monthly meetings to update the teams and seek for improvements.

We initiated active surveillance of a) influenza vaccination rates using electronic medical records and b) pertussis vaccination rates using initially a paper pertussis screening form that was transitioned to an electronic form. The paper screening form was developed using stakeholder input and pilot tested for mothers. The paper form determined vaccine eligibility and tracked steps leading to vaccination delivery (physician called, physician refused/approved, patient refused, patient reason for refusal, and physician reason for refusal). In April 2014, the pertussis paper screening form was transitioned to an electronic screening form.

Results

Implementation of our multicomponent intervention occurred over 9 months (September 2013 to May 2014). Many barriers along multiple domains (people, process, documentation and equipment) were identified (see Fig. 1) including vaccine status being documented in a different electronic record from that used for vaccine assessment, vaccine ordering and medication recording. Many nurses lacked the knowledge to initiate any of the vaccination protocols.

Additional barriers included vaccine delivery being limited to the second day of hospitalization. Vaccines not given on day two were removed from the Pyxis and returned to pharmacy resulting in the nurse having to re-request the vaccine. Often vaccines were not delivered due to the resultant delay, especially when families were eager to go

* Corresponding author at: Pediatric Quality and Safety, Children's Memorial Hermann Hospital, 6411 Fannin Street, Houston, TX 77030.
E-mail address: susan.lesser@memorialhermann.org (S.R. Lesser).

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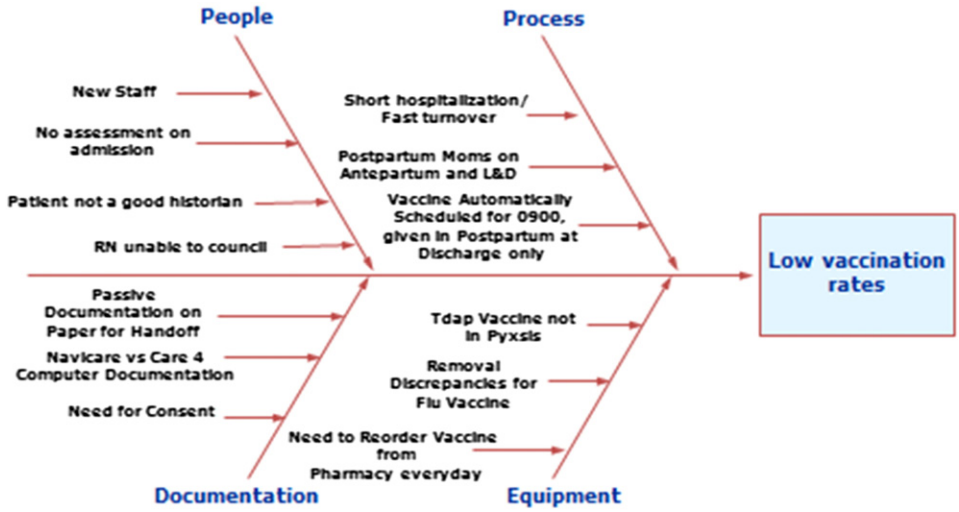

Fig. 1. Fishbone.

home. In addition, not all postpartum patients are housed on the postpartum floor with many overflow patients being admitted to antepartum and to labor and delivery. Finally, unlike CMS monitored vaccinations, pertussis vaccination required individual physician orders.

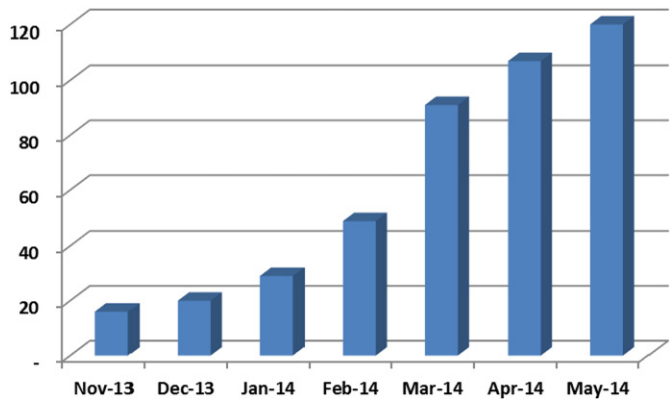

Fig. 2. Total doses of Tdap vaccine delivered in postpartum units by month, November 2013 to May 2014.

To address these barriers, we expanded education to include all nurses involved in vaccine delivery in our postpartum, antepartum and labor and delivery units. Specifically nurses were educated on the importance of immunizing the mother to protect the newborn and on the process for assessing and documenting vaccinations in a different computer system than where they were currently documenting. CDC educational material about vaccinations during pregnancy was added to the postpartum admission packets. We obtained approval for vaccines to be delivered at any point during the postpartum admission versus only at discharge. Finally, the storage of the Tdap and influenza vaccine was moved to an on-unit Pyxis versus the pharmacy, to facilitate timely delivery.

Total Tdap vaccines increased in our postpartum unit from 4 doses in August 2013 to 120 in May 2014 (Fig. 1). Screening for eligibility showed ~200 women each month who were eligible for the vaccine (Fig. 2). The percentage of eligible mothers vaccinated against pertussis increased from < 5% to 61% (Fig. 3). Total administered doses of influenza vaccine decreased during the 2013–2014 influenza season from 119 in October 2013 to 42 in March 2014 (Fig. 4). Screening for eligibility showed an average of 180 women each month who are eligible for the vaccine (Fig. 5) with vaccination rates falling from 40% to 24% between September 2013 – March 2014. (Figs. 6 and 7).

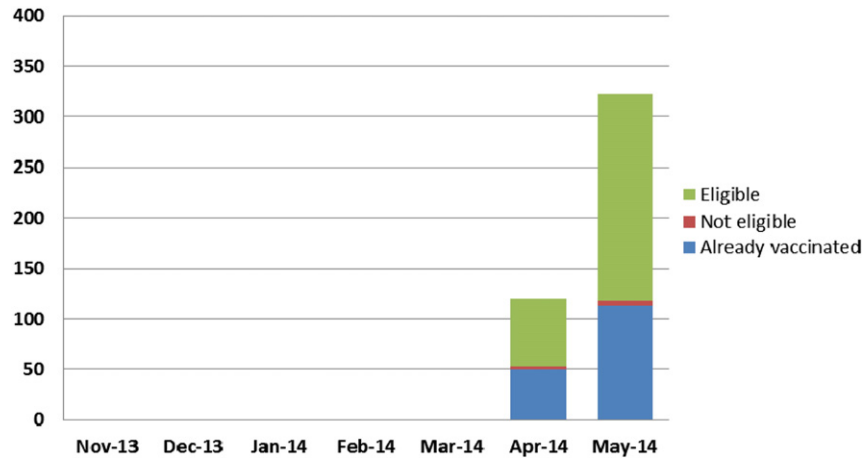

Fig. 3. Tdap vaccine status at time of admission to postpartum.

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