

Survey, Education, and Vaccine Consent Alterations: Improving Hepatitis B Vaccination Timeliness for Very Low Birth Weight Infants in the NICU

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Unified Quality Improvement Symposium
February 3, 2021

Background / Introduction

- Hepatitis B vaccination recommendations for infants born to HBsAg (-) women (American Academy of Pediatrics):
 - Infants > 2000 g: Initial dose at birth (<24 hours)
 - Infants < 2000 g: Initial dose at 1 month of age or hospital discharge
 - Increased immunological response with deferral of Hepatitis B vaccination until 1 month.
- Effectiveness and relative safety of Hepatitis B vaccination demonstrated in very low birth weight (VLBW) infants (<1500 g)
- VLBW infants (<1500 g) continue to have a delayed immunization or complete lack of initial Hepatitis immunization
 - Leads to discharge without vaccination, delay of infant vaccination series, and reduced effectiveness of future vaccinations

Collaborative Team Members & Location

- Arjun Patel, Medical Student
 - Ryan Moore, Neonatologist
 - Deborah Westbrook, Pediatric Pharmacist
 - Nursing Support
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- Location: NICU at VMC, 50 bed Level IV NICU

AIM Statement:

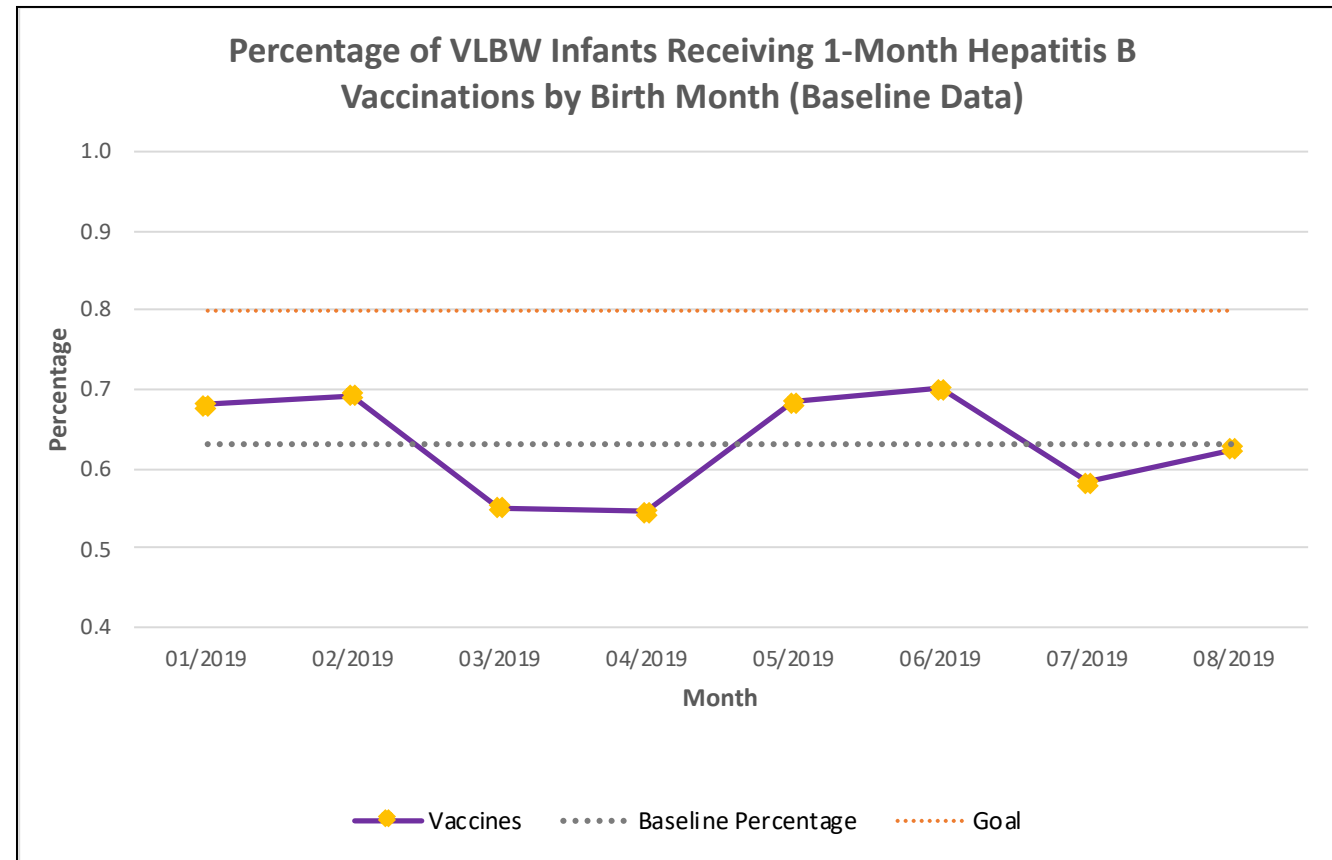
Improve timeliness (delivery by <33 days) of 1-month Hepatitis B vaccinations to VLBW (<1500 g) infants in the NICU to 80% by 12/2020

Measures:

- Outcome Measure:
 - Monthly percent of VLBW infants admitted to the NICU that received Hepatitis B vaccination on time
- Process Measures:
 - Number of staff receiving survey and education
 - Number of consent forms filled out in L&D/at admission and transferred with VLBW infant to NICU
- Baseline vaccination data:
 - Identified by cross referencing NICU admission data with Hepatitis B vaccination records (8 months: 01/2019-08/2019)

Baseline Data:

Baseline Data (01/2019-08/2019)	
VLBW Infants Vaccinated	82
VLBW Infants Admitted to NICU	130
Percentage of VLBW Infants Vaccinated	63.08%



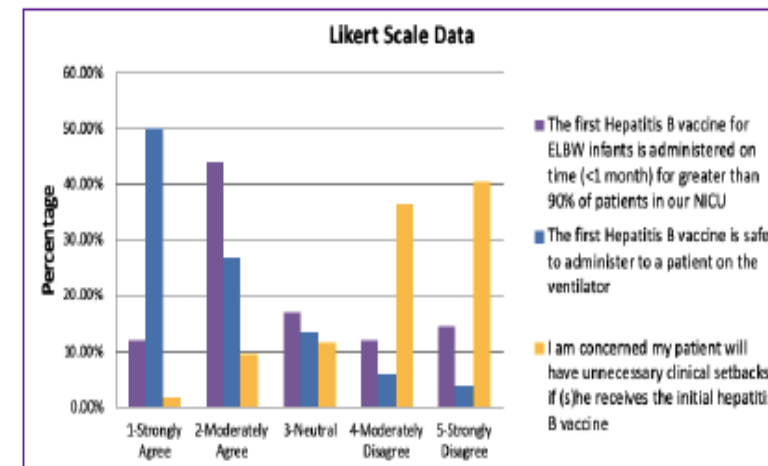
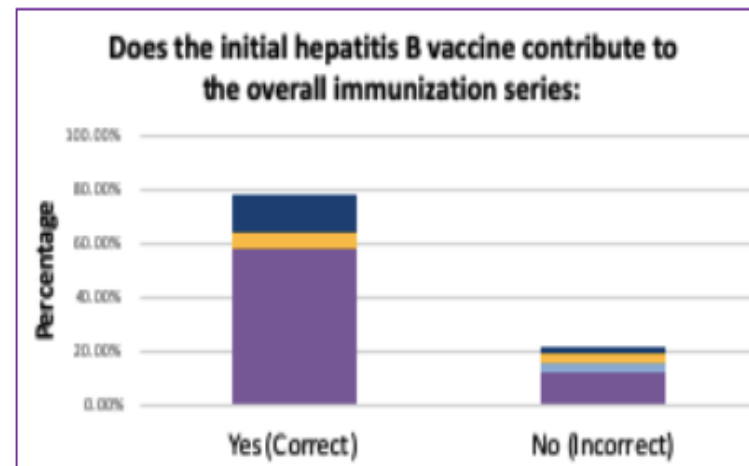
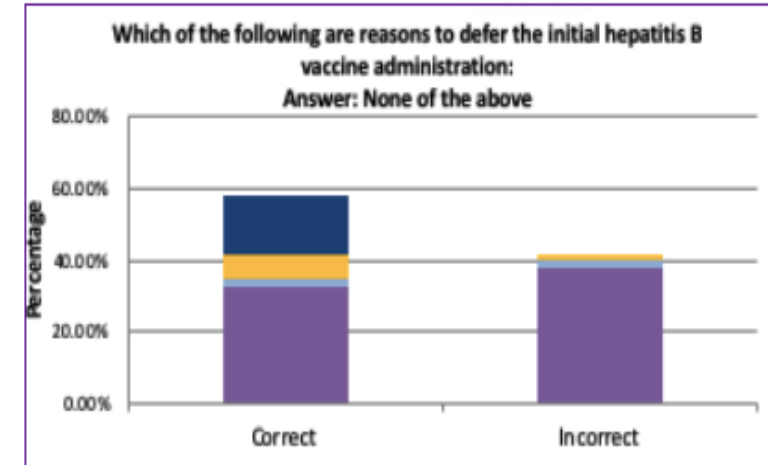
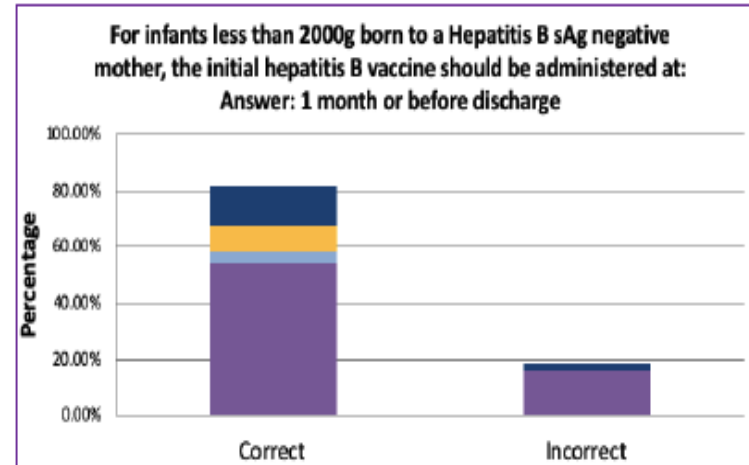
Improvement Strategies Employed

- PDSA 1: Survey to staff to identify knowledge limits and perceptions regarding VLBW vaccination and to guide future education (10/2019)

Survey and Survey Results:

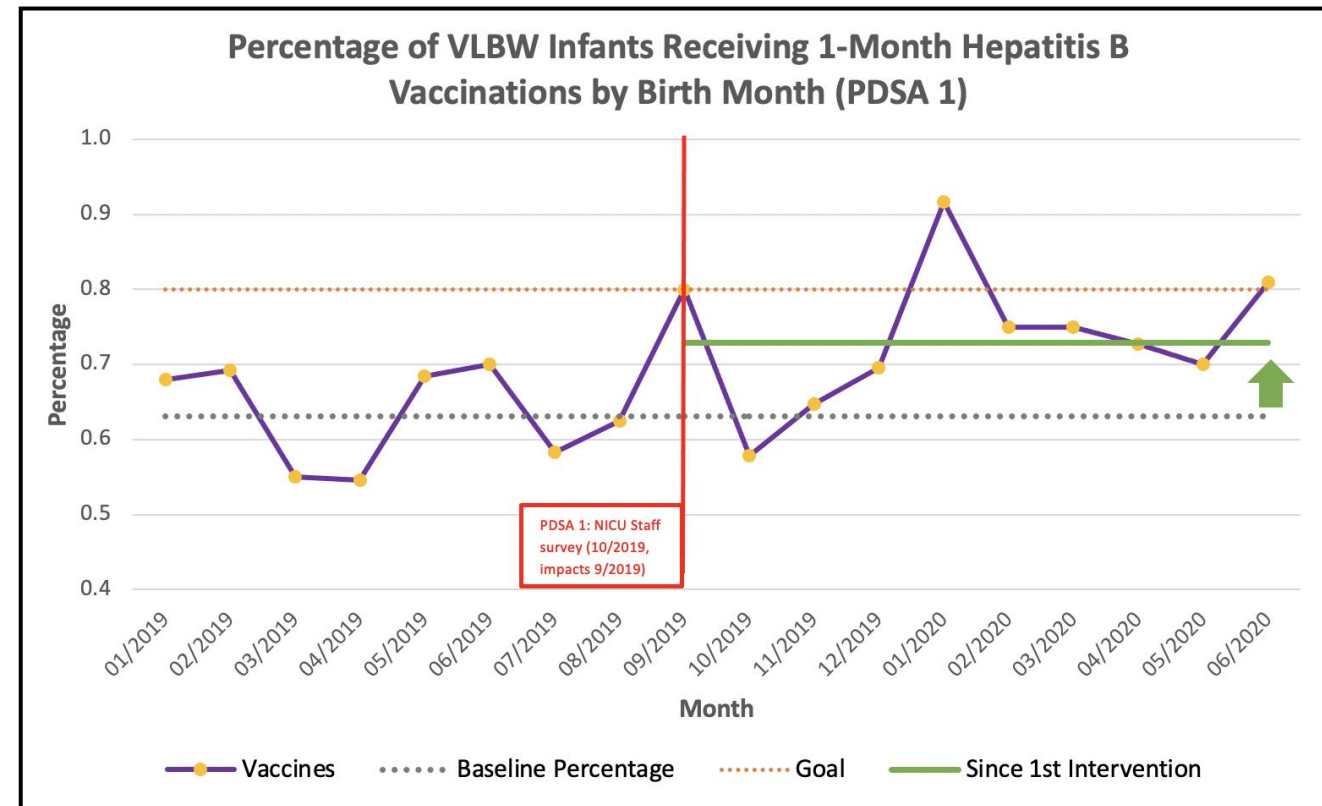


- Please indicate your profession: nurse, resident/fellow, APP, attending
- For infants less than 2000g born to a Hepatitis B sAg negative mother, the initial hepatitis B vaccine should be administered at:
 - Birth
 - 1 month of life or before discharge (Correct)
 - 36 weeks corrected and greater than 2000g
 - When greater than or equal to 2000g
- Which of the following are reasons to defer the initial hepatitis B vaccine administration:
 - A) Patient on antibiotics
 - B) Elevated apnea/bradycardia count
 - C) Patient within 48 hours of discharge
 - A and B
 - All of the above
 - None of the above (Correct)
- Does the initial hepatitis B vaccine contribute to the overall immunization series (Yes (Correct)/No)
- Likert Scale (1=Strongly Agree to 5= Strongly Disagree)
 - The first Hepatitis B vaccine for ELBW infants is administered on time (< 1 month) for greater than 90% of patients in our NICU
 - The first Hepatitis B vaccine is safe to administer to a patient on the ventilator
 - I am concerned my patient will have unnecessary clinical setbacks if (s)he receives the initial hepatitis B vaccine
- What is your preferred method of receiving further information regarding the initial Hepatitis B vaccine in VLBW infants (select all that apply):
 - Email, Presentations, Flyers, Scrolling Information on Communication Board, Other



Outcomes (PDSA 1)

Post-PDSA Vaccination Data (09/2019-06/2020)	
VLBW Infants Vaccinated	110
VLBW Infants Admitted to NICU	151
Percentage of VLBW Infants Vaccinated	72.85%



Improvement Strategies Employed

- PDSA 1: Survey to staff to identify knowledge limits and perceptions regarding VLBW vaccination and to guide future education (10/2019)
- PDSA 2: Education distributed to provide information related to vaccine administration, survey results, and changes to workflow (08/2020)

Education:

A QUICK HITS FOR HEPATITIS B VACCINATION IN VLBW INFANTS

A Guide on NICU Performance and Proper Procedure with Pertinent Survey Data from 10/2019

Who?

Infants <1500 grams (VLBW, Very Low Birth Weight)

What?

1 Month Hepatitis B Vaccination



When should VLBW infants receive the vaccination?

1 Month of age OR before discharge from the hospital (if discharged at <1-month) (81.8% correct!)

Why do we give the vaccine at 1-month & why is it important that infants receive the vaccine?

VLBW infants who receive the vaccination at 1 month demonstrated increased immunogenicity by the end of their hepatitis B series compared to those who receive it at birth.¹⁻³ Low birth weight infants are at greater risk of increased morbidity from vaccine preventable diseases. The earliest immunization with greatest response helps to minimize risk of infection.⁴

What are contraindications to vaccination/reasons to defer the initial hepatitis B vaccine?

NONE! Antibiotics, elevated apnea/bradycardia count, potential for discharge within 48 hours, and ventilator dependence are NOT contraindications. The only true contraindication per the manufacturer is a severe allergic reaction after a previous dose or to a vaccine component (yeast). The WHO states that minor illness, asthma/allergy, antibiotics, prematurity, low birth weight, and birth jaundice are NOT contraindications.⁵

Our survey showed only 58.2% of respondents correctly identified no contraindications to vaccine!

What are common non-emergent side effects of the vaccination?

While commonly cited side effects are pain, erythema, swelling, fever, and headache, there has been no documented link between neonatal sepsis/death and a variety of other medical conditions (rheumatoid arthritis, thyroid disease, etc) with studies showing no significant differences in fever, allergic reactions, seizures, or neurological events.^{6,7}

How do YOU think WE do?

Based on our survey in October 2019, 56.1% of respondents thought we administer vaccinations to >90% of our VLBW infants. Various perceptions in our performance was evident. For instance, nursing staff (44.8%) were less likely to agree with this statement than attendings (87.5%).

How do we ACTUALLY do?

Baseline vaccination rate: 63.08% (82/130) (01/19-08/2019)

Since PDSA 1: NICU staff survey (10/19) impacting vaccination rates for babies born starting in 9/2019, 66.26% (108/163) (09/2019-Present)

Multiple studies show there is a significant delay in immunization for VLBW infants, but that doesn't mean we shouldn't work to improve this! ^{8,9}

Next steps?!

Altered Hepatitis B consent process: mothers admitted to L&D for delivery of pre-term babies will now sign the hepatitis B vaccination consent form when admitted. This form will travel with the baby to the NICU.

Improvement Strategies Employed

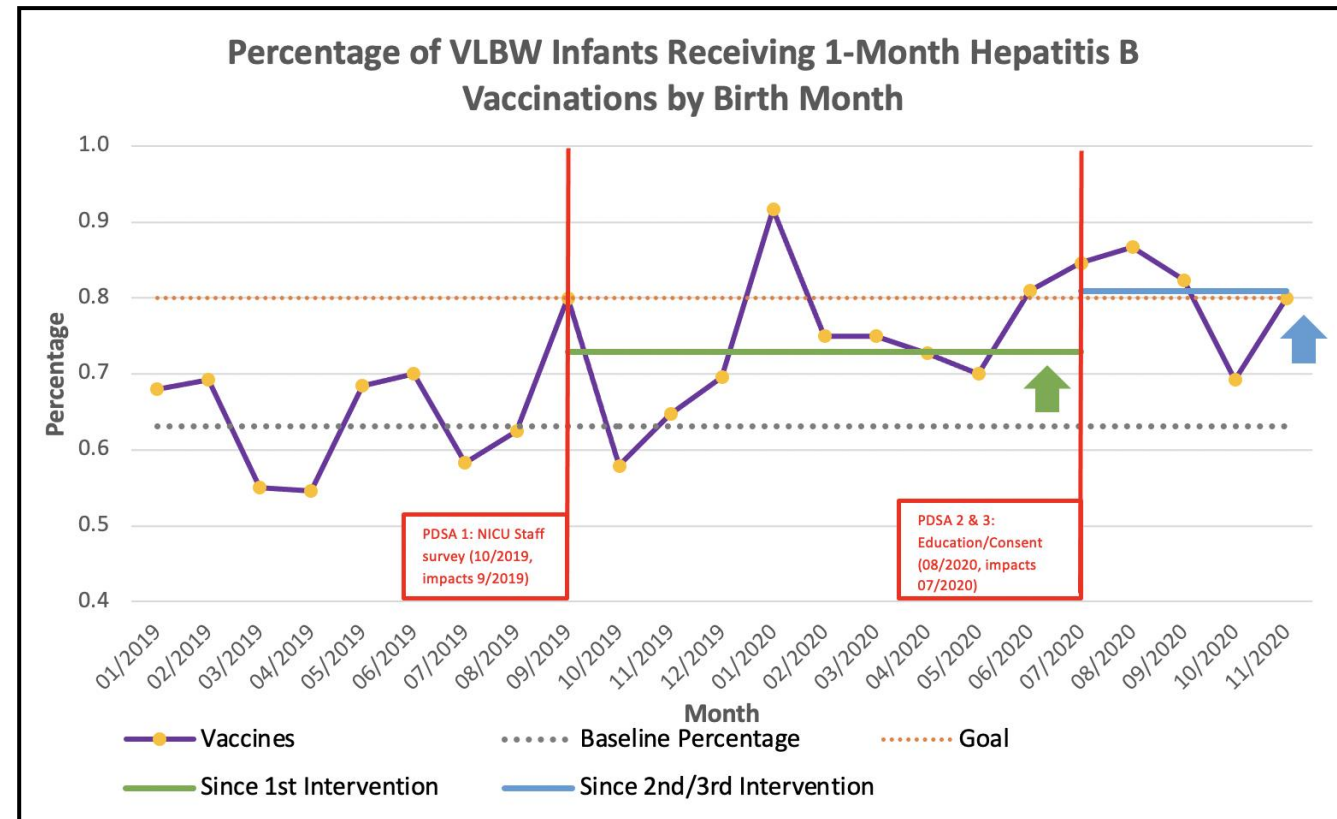
- PDSA 1: Survey to staff to identify knowledge limits and perceptions regarding VLBW vaccination and to guide future education (10/2019)
- PDSA 2: Education distributed to provide information related to vaccine administration, survey results, and changes to workflow (08/2020)
- PDSA 3: Hepatitis B consent process altered (08/2020)

Consent Process Alterations:

- Prior consent process:
 - Gather consent for Hepatitis B vaccination from parents in person around the 1-month time mark
- Identified problems with consent process:
 - Providers remember vaccine too late for consent to be gathered
 - Parents unable to/did not return to hospital to sign paperwork in time
 - Unable to ascertain consent via telephone without provision of vaccine information materials
- Updated consent process:
 - Consent obtained at admission of mother to Labor and Delivery with consent form following infant to NICU

Outcomes (PDSA 2 & 3)

Post-PDSA Vaccination Data (07/2020-11/2020)	
VLBW Infants Vaccinated	51
VLBW Infants Admitted to NICU	63
Percentage of VLBW Infants Vaccinated	80.95%



Conclusions:

- Original Hepatitis B vaccination delivery to VLBW infants in the NICU fell below specific aim of 80%
- Survey:
 - Deficiency in knowledge of actual NICU performance and contraindications to vaccine delivery was identified
 - Staff possess an adequate understanding of vaccine delivery time and a general belief that the vaccine is safe to deliver with limited clinical setbacks
- Survey (PDSA 1) helped improved vaccination rates to >72.85% (<80% goal)
- Education and consent process changes (PDSA 2 & 3) improved vaccination rates to 80.95% (>80% goal)

Challenges Encountered in QI Process

- COVID-19 disruption to QI process
 - Delayed education
 - Delayed consent process alteration
- Understanding consent process from legal perspective

Next Steps

- Continue to monitor sustainability, assessment of vaccination form completion at L&D, and a possible electronic health record intervention (1 month prompt/standing order)
- Further interventions/QI work: 2-month vaccination process

Questions?

Contact Information

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