Improving Timeliness of Hepatitis B Vaccine Administration For Newborns

APPD Platform Presentation
Resident QI Project
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Disclosures

• I have no financial relationship with any commercial organization that produces healthcare products or services

• I will not be discussing investigational or off-label uses of any medications, medical devices or products
Training Background

- Pediatric Residency training: Greenville, SC
  - Branch of University of SC School of Medicine
- PDSA method of quality improvement taught
  - Didactics, role-modeling of senior residents

- PL-2 residents required to complete a QI project
  - May of PL-2 year
- All present posters at SC AAP meeting
  - July of PL-3 year

- Our program: residents have won regional and/or state awards for resident QI projects past 3 years
Project Choice

• Residents encouraged to choose a topic of interest for QI project

• Program directors or other faculty mentors help identify measurable outcomes and appropriate scope for project

• My interests:
  - Newborn care, preventive medicine, immunizations, general pediatrics
2005 CDC Recommendations

• Infants born to *HBsAg-positive* mothers
  - HBV and HBIG *<12 hours after birth*

• Infants born to *HBsAg-unknown* mothers
  - HBV *<12 hours after birth*
  - Determine maternal HBsAg status asap
  - If HBsAg positive, give HBIG immediately (within 7 days)

• Full-term infants >2 kg born to *HBsAg-neg* mothers
  - HBV *before hospital discharge*
Why is Early Hepatitis B Vaccine Administration So Important?

• Birth dose is associated with higher rates of on-time completion of the primary vaccine series

• Major determinant of effectiveness is early administration of initial dose

• Prior to routine childhood hepatitis B vaccination:
  – Childhood infections resulted in 30-40% of chronic HBV cases

• Hepatitis B vaccine alone
  – 70–95% effective in preventing perinatal HBV infection in infants born to chronic carriers
Clinical Background

• GHS: largest delivery center in SC
  - 5000-6000 annual deliveries
  - 90% admitted to Level 1 nursery

• High risk patient population on teaching service
  - Lack of long-term, monogamous relationship
  - Late/poor prenatal care common
  - History of sexually transmitted infections or IV drug use

• Often, prenatal records or initial maternal HbSAg test results may not be available within first 12 hours of life

• **Therefore, goal is to vaccinate all infants against Hepatitis B within 12 hours of delivery**
PDSA Cycle 1

• **Plan:**
  - Measure baseline percentage of newborns vaccinated by 12 hours of age

• **Do:**
  - Chart review, March 2009

• **Study:**
  - 200/209 (95.7%) immunized prior to discharge
  - 52% by 12 hours of age

• **Act:**
  - Increase percentage of infants vaccinated by 12 hours of age
  - Initial step: change current preprinted order set wording that states for nurses to give vaccine “before discharge”
PDSA Cycle 2

• **Plan:**
  - Measure the effect of changing preprinted admission orders to require vaccination of newborns “by 12 hours of age” instead of “before discharge”
  - Still requires parental consent prior to vaccination

• **Do:**
  - Implement new order set, April 2009
  - Chart review, July 2009

• **Study:**
  - 200/206 (97%) vaccinated prior to discharge
  - 65% by 12 hours of age

• **Act:**
  - Identify barriers preventing vaccination within 12 hours of delivery
  - Address those barriers to improve timeliness of vaccine administration

**Vaccination Rates over Time**

- 65%
- 23%
- 12%
- <12 hrs
- 12-24 hrs
- >24 hrs
PDSA Cycle 3

• **Plan:**
  - Determine barriers to early vaccine administration

• **Do:**
  - Email poll of unit nursing staff – October 2009

• **Study:**
  - Perceived barriers
    - Language barrier
    - Sleepy moms after C-sections
    - Undecided parents wished to speak with physician prior to signing consent

• **Act:**
  - Unit Council meeting - January 2010
    - Educated regarding the importance of early vaccine administration
    - Discussed accountability plan for vaccine administration
      - Admitting nurse to give vaccine, next shift and supervisors to confirm
    - Determined means to address perceived barriers
      - Address the physician’s role in timely vaccination
      - Residents made available 24-7 to answer questions
PDSA Cycle 4

• **Plan:**
  - Measure the effectiveness of nursing education and barrier removal on timeliness of vaccine administration

• **Do:**
  - Chart review, March 2010

• **Study:**
  - 200/216 patients (92.6%) vaccinated prior to discharge
  - 73% by 12 hours of age
  - Of note, no resident doctors reported being called to address vaccination questions overnight

• **Act:**
  - Identify remaining barriers preventing early vaccine administration
  - Provide education to a larger group of nursing staff
  - Address project sustainability
Outcomes

*Fisher’s exact test (2-tailed)
Project Sustainability

• **Plan:**
  – Transition the project to unit leadership for ongoing sustainability

• **Do:**
  – Add this quality initiative to the “Mother-Baby Unit Quality Score Card”
  – Continue education of nursing staff
  – Educate parents regarding the importance of Hepatitis B vaccination
  – Simplify consent process for vaccination
    • Bundle with general admission consent forms
    • Consider elimination of consent
      – Change to “opt out” stance but no precedent could be found

• **Study:**
  – Clinical nurse educator performs smaller monthly chart reviews long-term

• **Act:**
  – Ensure ongoing availability of physicians for parent questions
  – Continue education of nursing staff and parents
  – Continue to address barriers
Sustained Outcomes

% of Newborns Receiving HepB Vaccine wi 12 hrs of Birth:
Family Beginnings Unit-08 6263

- % of newborns receiving HepB vaccine wi 12 hrs of birth
- Internal Target > 90%: seeking external benchmark
Other Conclusions

• Unanticipated outcomes
  – Feedback from community physicians overwhelmingly positive
    • Improved documentation of vaccine administration
    • Confidence that vaccine administration is not overlooked
    • If HBV not documented by 12 hours, “red flag” opportunity for physician to address vaccination with parents during newborn examination

• This type of QI can easily apply to any pediatric practice
  – Points to the importance of a team effort between physicians, nursing staff, and families
References

- King Edward Memorial Hospital Clinical Guidelines. Care of the Neonate. 10.4.3 Neonatal Hepatitis B Vaccine. Revised Oct 2008.
- Admission Orders for Labor & Delivery and Newborn Units to Prevent HBV Transmission. Immunization Action Coalition • 1573 Selby Ave. • St. Paul, MN 55104 • (651) 647-9009 • www.immunize.org • www.vaccineinformation.org
- Asian Liver Center at Stanford University, http://liver.stanford.edu