Safe and Healthy Beginnings:

Learning Session Two

Team Highlights - Hyperbilirubinemia

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Loyola University
Medical Center
Newborn Nursery

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Our team plans: August 2007

By 1/31/08 LUMC’s newborn nursery will ensure safe and healthy beginnings for all newborns by focusing on the systematic assessment and documentation for risk of clinically significant hyperbilirubinemia in all newborns.

Hyperbilirubinemia measures of success

100% of infants:

• Will have documented risk assessment prior to discharge

• Discharge exams will document the presence or absence of jaundice

• Who are at risk will have a follow-up appointment within 2 days of discharge.
Key interventions and results

24hr TSB for all newborns and mandatory risk assessment PTD: 8/13/07
Key interventions and results

Presence or absence of jaundice on discharge exam: 9/10/07

EMR DOCUMENTATION – NEWBORN NURSERY DISCHARGE NOTE

III. NURSERY COURSE
Bp is an infant born via NVD at 38 6/7 weeks by done to a 23 y/o G4P1021 mother with PMH of GERD during pregnancy. Pregnancy and delivery were relatively uncomplicated, aside from mild hypothyroidism prenatally ultrasound and an abnormal pap smear. Infant was warmed, dried, suctioned, and transferred to RNH for routine care. Appearances were normal. She was found to be AGA. Infant is taking formula well. Parent passed the hearing screen bilaterally. Hep B consent was obtained and immunization was given on 11/20/07. At 24 hours of life a metabolic screen was sent and bilirubin was checked. The 24 hour TSB was 5.6mg/dl, in the low intermediate risk range. There was jaundice noticed at the face at discharge on DOL 3.

VI. RISK ASSESSMENT FOR HYPERBILIRUBINEMIA
A. Predischarge TSB (based on nomogram): < 50th Percentile (Decreased)
B. Visible Jaundice: Before discharge (Minor)
C. Gestational age: 26 - 36 weeks (Major)
D. Previous Sibling: N/A
E. Blood groups: RhD positive (Major)
F. Feeding: Exclusively formula feeding (Decreased)
G. Race: East Asian (Major)
H. Other factors: Maternal age =< 26 years (Minor)

VII. AFTER DISCHARGE FOLLOW-UP
A. Follow up Appointment Date: 1/24/08
B. Follow up Appointment Time: 3:30 pm
C. Physician: Dr. Rhode
D. Clinic: Oakbrook Terrace
E. Special Instructions:
Some babies will become jaundiced (skin appears more yellow) within the first week of life. If the newborn's skin appears more yellow than normal, check the bilirubin level at 24 hours of age. If you notice that your baby's skin appears more yellow after discharge, you should contact your doctor to make an appointment to be seen.

Please note: Any infant discharged before 72 hours of age should be seen within 2 days after discharge.
Key interventions and results

EMR implementation of risk assessment: 10/24/07

EMR DOCUMENTATION – NEWBORN NURSERY DISCHARGE NOTE

III. NURSERY COURSE
By is an infant born via NSVD at 36 0/7 weeks' gestation to a 30 y/o G4P1021 mother with PMH of GERD during pregnancy. Pregnancy and delivery were relatively uncomplicated, aside from mild oligohydramnios on prenatal ultrasound and an abnormal pop smear. Infant was warmed, dried, cleaned, and transferred to NBN for routine care. Apparatus was 3/4. She was found to be AGA. Infant is tolerating formula well. Patient passed the hearing screen bilaterally. Hip B consent was obtained and immunization was given on 1/22/08. At 24 hours of age a metabolic screen was sent and bilirubin was checked. The 24 hour TSB was 5.8 mg/dL, in the low intermediate risk range. There was jaundice noticed to the face at discharge on DOL 3.

VI. RISK ASSESSMENT FOR HYPERBILIRUBINEMIA
A. Predischarge TSB (based on nomogram) < 50th Percentile (Decreased)
B. Visible Jaundice: before discharge (Minor)
C. Gestational age: 20 - 25 weeks (Major)
D. Previous Sibling: N/A
E. Blood group: RhD positive: N/A
F. Feeding: exclusive formula feeding (Decreased)
G. Race: East Asian (Major)
H. Other factors: Maternal age > 28 years (Minor)

VII. AFTER DISCHARGE FOLLOW-UP
A. Follow up Appointment Date: 1/24/08
B. Follow up Appointment Time: 3:30 p.m.
C. Physician: Dr. Rhode
D. Clinic: Oakbrook Terrace
E. Special Instructions:
Some babies will become jaundiced (skin appears more yellow than usual) within the first week of life. In the newborn nursery your baby had a bilirubin level checked at 24 hours to screen for hyperbilirubinemia which causes babies to be jaundiced and to be placed under normal bilirubin. If your notice that your baby’s skin appears more yellow after being discharged home, you should contact your doctor to make an appointment to be seen.

Please note: Any infant discharged before 72 hours of age should be seen within 2 days after discharge.
Key interventions and results

Written counseling: 10/19/07

Jaundice in Newborns

WHAT IS JAUNDICE IN NEWBORNS? Jaundice is a condition where there is too much bilirubin in the blood. Jaundice can occur in newborn babies. Bilirubin is a yellow pigment (coloring) released during the normal breakdown of your baby's red blood cells (RBC). Blood carrying bilirubin goes to the liver, where it is prepared before removal by the intestines (bowels). Bilirubin then leaves your baby's body through his bowel movements (BM). When the body has problems removing bilirubin, it stays in the blood and builds up in the skin. This results in yellowing of the skin and whites of the eyes in a newborn baby.

WHAT CAUSES JAUNDICE IN NEWBORNS? Jaundice occurs when the body makes too much bilirubin or has problems removing it. These problems usually happen when the baby's liver is not yet well developed. It may take time for the liver to get used to its work of removing bilirubin. Jaundice usually appears after the first 24 hours of life in a healthy newborn.

Jaundice in newborns may also be caused by problems in any of the following:

- **Blood**: Blood mismatch between the mother and baby, hemolytic anemia (RBC death), or polycythemia (increased RBC).
- **Genetics**: Lack or absence of certain enzymes, such as pyruvate kinase or glucose-6-phosphate, during birth.
- **Infections**: These may include infections caused by germs, such as bacteria or viruses.
- **Liver**: Liver diseases, such as biliary atresia (blocked or absent bile ducts) or hepatitis (swelling of the liver).
- **Breast milk**: Rarely, breast milk can cause jaundice in newborn babies. If this is the case your caregiver may have you stop breast feeding until the jaundice improves.

WHAT ARE THE SIGNS AND SYMPTOMS OF JAUNDICE IN NEWBORNS? Jaundice makes your baby's skin and the whites of his eyes turn yellow in color. This yellow coloring usually starts on your baby's face and moves down to the chest. It then goes to the abdomen (belly), and spreads to the arms and legs. Depending on the cause, your baby's jaundice may appear at birth or anytime after. Your baby may feed poorly or become fussy or sleepy if the bilirubin level continues to increase. When the level stays very high, his brain and nerves may be affected. Your baby may develop fever and a high-pitched cry. Muscle spasms (tetany) may also be present. When this happens, your baby may arch his neck and body backward.

HOW IS JAUNDICE IN NEWBORNS DIAGNOSED? Your baby’s caregivers will check how much of your baby’s body has jaundice. Blood tests will be done to learn how much bilirubin is in your baby's blood. Other tests may be done if your baby's caregiver thinks that other problems may be causing the jaundice. These may include blood tests to check the function of his liver, and ultrasonography (ultrasound).

HOW IS JAUNDICE IN NEWBORNS TREATED? Treatment of jaundice depends on the amount of bilirubin present in your baby's blood. It will also depend on how long your baby was inside the womb (gestational age) and his condition now.

Key interventions and results

EMR DOCUMENTATION – NEWBORN NURSERY DISCHARGE NOTE

III. NURSERY COURSE

Boy is an infant born via NSVD at 36.5/7 weeks by dates to a 36 y/o G1P1021 mother with PMH of GERD during pregnancy. Pregnancy and delivery were relatively uncomplicated, aside from mild oligohydramnios on prenatal ultrasound and an abnormal pap smear. Infant was warm, pink, and breathing, and transferred to NICU for routine care. Apgars were 8/9/9. She was found to be ABO+D. Infant is doing well. Patient passed the hearing screen bilaterally. Hep B vaccine was obtained and immunization was given on 1/20/08. At 24 hours of life a metabolic screen was sent and bilirubin was checked. The 24 hour TSB was 5.8mg/dL, in the low intermediate risk range. There was jaundice noticed to the face at discharge on DOL 3.

VI. RISK ASSESSMENT FOR HYPERBILIRUBINEMIA

A. Predischarge TSB (based on nomograms < 50th Percentile (Decreased)
B. Visible Jaundice: Before discharge (Minor)
C. Gestational age: 35 - 36 weeks (Major)
D. Previous Sibling: N/A
E. Blood groups: ABO+D: N/A
F. Feeding: Exclusively formula feeding (Decreased)
G. Race: East Asian (Major)
H. Other factors: Maternal age > 25 years (Minor)

VII. AFTER DISCHARGE FOLLOW-UP

A. Follow-up Appointment Date: 1/24/08
B. Follow-up Appointment Time: 3:30 p.m.
C. Physician: Dr. Rhodes
D. Clinic: Ostrowe Terman
E. Special Instructions:

Some babies will become jaundiced (this appears yellowish) within the first week of life in the newborn nursery your baby had a bilirubin level checked at 24 hours to screen for hyperbilirubinemia which causes jaundice (this will vary in each baby). If you notice that your baby’s skin appears more yellow after being discharged home, you should contact your doctor to make an appointment to be seen.

Please note: Any infant discharged before 72 hours of age should be seen within 2 days after discharge.

Oral counseling: 12/1/07
Additional interventions

• Developed mechanism for Sunday blood draw for serum bilirubin if needed for 2 day follow-up
• Grand rounds given to pediatric department outlining entire project as well as update on neonatal hyperbilirubinemia
Near-term goals...

- Complete bilirubin risk nomogram implementation into EMR
- Complete data collection:
  - Readmission rates related to hyperbilirubinemia (2006 vs. 2007)