

Include in the pathway (Patients must be all of these):

- Infants with unconjugated bilirubin of greater than 15 if > 38 weeks gestation and greater than 13 if 35-38 weeks gestational age
- Infant 1-7 days of age
- Infants with a gestational age of 35 or more weeks
- Infants without clinical signs or symptoms of sepsis

Exclude from the pathway (Patients may be any of these):

- Infant less than 35 weeks gestation
- Infants who have an elevation of direct or conjugated bilirubin
- Infants with clinical signs or symptoms of sepsis

Patients should be considered for removal from the pathway if;

(nursing staff should contact physician if any of the following apply)

- Total serum bilirubin does not decrease or continues to rise despite intensive phototherapy (strongly suggest the presence of hemolysis or G6PD deficiency)
- Infant with unstable vital signs, hypothermia, or temperature > 100.4°.

Criteria for Admission

- Infants greater than 38 weeks gestational age with an unconjugated bilirubin of greater than 15
- Infants 35-38 weeks gestation with an unconjugated bilirubin of greater than 13

Criteria for Discharge

- Infants greater than 38 weeks gestation: unconjugated bilirubin less than 15
- Infants 35-38 weeks gestation: unconjugated bilirubin less than 12
- Maintaining or gaining weight
- Taking adequate amounts breastmilk or formula
- Safe home environment and Primary Medical Doctor identified

Background Information:

- Infants with hyperbilirubinemia may and should continue to breastfeed. May supplement with expressed breast milk or formula if the infant's intake is inadequate, weight loss is excessive, or the infant appears dehydrated.
- Risk factors most frequently associated with severe hyperbilirubinemia are breastfeeding, gestation below 38 weeks, significant jaundice in a previous sibling, and jaundice within the first 24 hours of life.
- Jaundice is usually first seen in the face and then progresses caudally to the trunk and extremities.
- Severe hyperbilirubinemia in an African American infant should always raise the possibility of G6PD deficiency.
- Intensive phototherapy can decrease the initial bilirubin level 30 to 40% in the first 24 hours with the most significant decline in the first 4 to 6 hours.
- About 50% of term and 80% of preterm infants develop jaundice. Jaundice usually appears 2 to 4 days after birth and disappears 1 to 2 weeks later.
- Infants with a total bilirubin > 25 mg/dl - consider exchange transfusion

Goals:

- Promote and support successful breastfeeding
- Prevent acute bilirubin encephalopathy

AAP policy, Clinical Practice Guidelines on Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation, 2004

Weight:

Allergies:

Time/ Date: General

- 1) Diagnosis: Hyperbilirubinemia
- 2) Estimated length of stay = 1-2 days
- 3) Condition: Stable
- 4) Vitals (including BP) and pain assessment every 6 hours and PRN for pain
- 5) Activity: As tolerated for age
- 6) Accurate I's & O's (every 4 hrs to determine PO intake and output)
- 7) Daily weights
- 8) Initiate "Learning Assessment" and implement Hyperbilirubinemia education.
- 9) On admit, assess discharge needs and make appropriate referrals (see pediatric admission database).
- 10) Lactation consult if problems with breast feeding
- 11) Double bank phototherapy - initiate within 1 hour of admission
 Triple bank phototherapy - initiate within 1 hour of admission
- 12) Isolette per hospital guidelines
- 13) Call physician if temperature > 100.4°

Education

- 1) **BEGIN EDUCATION ON ADMISSION**
- 2) Review hyperbilirubinemia "Patient Education Sheet" with family
 - Teach signs of dehydration, signs of inadequate PO intake
 - Review whom to contact for problems and reasons to call physician or return to ER.

Diet and Fluids

- 1) Breastfeed or bottle-feed (formula or expressed breast milk) every 2-3 hours
- 2) If infant's weight loss from birth is > 12% or there is clinical or biochemical evidence of dehydration, may attempt oral rehydration with breast milk or formula. If oral intake is not adequate, notify physician
- 3) IVF: D5 1/4 NS at maintenance rate. Add 20 mEq KCL/L after first void (nurse to call pharmacy)
- 4) Wean IV fluids to saline lock, as PO's improve.

Diagnostic Tests

- Bilirubin panel every _____ hours
- Blood type (ABO, Rh)
- Direct antibody test (Coombs')
- CBC with differential
- Reticulocyte count
- G6PD if suggested by ethnic or geographic origin or if poor response to phototherapy
- CMP
- If total serum bilirubin > 20 mg/dl repeat bilirubin panel in 4 hours and call physician
- Other _____

Follow-up

- 1) Place preprinted discharge instructions in chart
- 2) FAX discharge instructions (once signed by physician) and Medication Reconciliation Form to primary care physician

Physician's Signature / ID Number: _____ Date: ____/____/____ Time: _____

Hyperbilirubinemia

page 1

Patient Label



Physician's Order Sheet

Interdisciplinary Patient/Family Learning Evaluation

Initial Patient/Family Learner Assessment

A learning evaluation is done with each initial teaching intervention for each learner. Teaching interventions should be documented in an ongoing manner with ongoing assessment and evaluation of readiness to learn, barriers to learning, and learning outcomes. Use your department or topic specific Interdisciplinary Patient/Family Education Documentation forms for ongoing patient/parent/family education documentation. Use this form for the initial assessment of a learner and keep this form with the ongoing patient/family education documentation forms.

Initial Learner Evaluation (assess one or multiple learners)			
1. _____ Date _____ (Pt./Primary care giver)	2. _____ Date _____ learner	3. _____ Date _____ learner	4. _____ Date _____ learner
Prior Knowledge of Plan of Care or care needs: <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	Prior Knowledge of Plan of Care or care needs: <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	Prior Knowledge of Plan of Care or care needs: <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____	Prior Knowledge of Plan of Care or care needs: <input type="checkbox"/> Comprehensive <input type="checkbox"/> Good <input type="checkbox"/> Limited <input type="checkbox"/> None <input type="checkbox"/> Other _____
Primary Language: check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	Primary Language: check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	Primary Language: check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads	Primary Language: check <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Hmong Other _____ <input type="checkbox"/> Writes <input type="checkbox"/> Reads
Readiness to learn: check <input type="checkbox"/> Asking pertinent questions <input type="checkbox"/> Actively Listening <input type="checkbox"/> Unreceptive <input type="checkbox"/> No interest demonstrated <input type="checkbox"/> Distracted	Readiness to learn: check <input type="checkbox"/> Asking pertinent questions <input type="checkbox"/> Actively Listening <input type="checkbox"/> Unreceptive <input type="checkbox"/> No interest demonstrated <input type="checkbox"/> Distracted	Readiness to learn: check <input type="checkbox"/> Asking pertinent questions <input type="checkbox"/> Actively Listening <input type="checkbox"/> Unreceptive <input type="checkbox"/> No interest demonstrated <input type="checkbox"/> Distracted	Readiness to learn: check <input type="checkbox"/> Asking pertinent questions <input type="checkbox"/> Actively Listening <input type="checkbox"/> Unreceptive <input type="checkbox"/> No interest demonstrated <input type="checkbox"/> Distracted
Barriers to learning: check <input type="checkbox"/> No barriers <input type="checkbox"/> Low literacy or Edu level <input type="checkbox"/> Cultural <input type="checkbox"/> Language <input type="checkbox"/> Visual, hearing, speaking <input type="checkbox"/> Religious, spiritual <input type="checkbox"/> Cognitive <input type="checkbox"/> Emotional <input type="checkbox"/> Motivation <input type="checkbox"/> Pain or fatigue <input type="checkbox"/> Other _____ Accommodation: <input type="checkbox"/> Interpreter <input type="checkbox"/> Audio <input type="checkbox"/> Visuals <input type="checkbox"/> Handouts <input type="checkbox"/> Explanations <input type="checkbox"/> Demonstrations <input type="checkbox"/> Other	Barriers to learning: check <input type="checkbox"/> No barriers <input type="checkbox"/> Low literacy or Edu level <input type="checkbox"/> Cultural <input type="checkbox"/> Language <input type="checkbox"/> Visual, hearing, speaking <input type="checkbox"/> Religious, spiritual <input type="checkbox"/> Cognitive <input type="checkbox"/> Emotional <input type="checkbox"/> Motivation <input type="checkbox"/> Pain or fatigue <input type="checkbox"/> Other _____ Accommodation: <input type="checkbox"/> Interpreter <input type="checkbox"/> Audio <input type="checkbox"/> Visuals <input type="checkbox"/> Handouts <input type="checkbox"/> Explanations <input type="checkbox"/> Demonstrations <input type="checkbox"/> Other	Barriers to learning: check <input type="checkbox"/> No barriers <input type="checkbox"/> Low literacy or Edu level <input type="checkbox"/> Cultural <input type="checkbox"/> Language <input type="checkbox"/> Visual, hearing, speaking <input type="checkbox"/> Religious, spiritual <input type="checkbox"/> Cognitive <input type="checkbox"/> Emotional <input type="checkbox"/> Motivation <input type="checkbox"/> Pain or fatigue <input type="checkbox"/> Other _____ Accommodation: <input type="checkbox"/> Interpreter <input type="checkbox"/> Audio <input type="checkbox"/> Visuals <input type="checkbox"/> Handouts <input type="checkbox"/> Explanations <input type="checkbox"/> Demonstrations <input type="checkbox"/> Other	Barriers to learning: check <input type="checkbox"/> No barriers <input type="checkbox"/> Low literacy or Edu level <input type="checkbox"/> Cultural <input type="checkbox"/> Language <input type="checkbox"/> Visual, hearing, speaking <input type="checkbox"/> Religious, spiritual <input type="checkbox"/> Cognitive <input type="checkbox"/> Emotional <input type="checkbox"/> Motivation <input type="checkbox"/> Pain or fatigue <input type="checkbox"/> Other _____ Accommodation: <input type="checkbox"/> Interpreter <input type="checkbox"/> Audio <input type="checkbox"/> Visuals <input type="checkbox"/> Handouts <input type="checkbox"/> Explanations <input type="checkbox"/> Demonstrations <input type="checkbox"/> Other
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Signature _____ Date _____	Signature _____ Date _____	Signature _____ Date _____	Signature _____ Date _____
Signature _____ Date _____	Signature _____ Date _____	Signature _____ Date _____	Signature _____ Date _____

Patient Label



pathway



Patient/Family Learner Assessment

Jaundice

What is jaundice?

Over half of all newborns develop some amount of jaundice, a yellow coloring in their skin, during the first week. This is usually a temporary condition, but may be a more serious sign of another illness. Jaundice is caused by the breakdown of red blood cells. As the old cells are broken down, hemoglobin is changed into bilirubin and removed by the liver. The build-up of bilirubin in the blood is called hyperbilirubinemia. Because bilirubin has a pigment, or coloring, it causes a yellowing of the baby's skin and tissues. As liver function matures, the jaundice goes away. A premature infant is more likely to develop jaundice. The yellow tint to the skin can often be seen by gently pressing on the baby's forehead or chest and watching the color return.

There are several types of jaundice:

- ***Physiologic Jaundice***
Physiologic Jaundice occurs as a "normal" response to the baby's limited ability to excrete bilirubin in the first days of life
- ***Breast Milk Jaundice***
About 2 percent of breastfed babies develop jaundice after the first week. Some develop breast milk jaundice in the first week due to low calorie intake or dehydration
- ***Jaundice from Hemolysis***
Jaundice may occur with the breakdown of red blood cells due to hemolytic disease of the newborn (Rh disease), having too many red blood cells, or bleeding
- ***Jaundice related to inadequate liver function***
Jaundice may be related to inadequate liver function due to infection or other factors

Why is jaundice a concern?

Although low levels of bilirubin are not usually a concern, large amounts can circulate to tissues in the brain and may cause seizures and brain damage. This is a condition called kernicterus

What are the symptoms of jaundice?

The following are the most common symptoms of jaundice. However, each baby may experience symptoms differently.

Symptoms may include:

- yellow coloring of the baby's skin - usually beginning on the face and moving down the body
- poor feeding or lethargy

Symptoms of jaundice may resemble other conditions or medical problems.

Always consult your baby's physician for a diagnosis

How is jaundice diagnosed?

The timing of the appearance of jaundice helps with the diagnosis. Jaundice appearing in the first 24 hours is quite serious and usually requires immediate treatment. When jaundice appears on the second or third day, it is usually "physiologic". However, it can be a more serious type of jaundice. When jaundice appears on the third day to the week, it may be due to an infection. Later appearance of jaundice, in the second week, is often related to breast milk feedings, but may have other causes.

Laboratory testing for hyperbilirubinemia may include:

- direct and indirect bilirubin levels - These levels reflect whether the bilirubin is bound with other substances by the liver so that it can be excreted (direct), or is circulating in the blood circulation (indirect)
- red blood cell counts
- blood type and testing for Rh incompatibility (Coomb's test)

Treatment for jaundice:

Specific treatment for jaundice will be determined by your baby's physician based on:

- your baby's gestational age, overall health, and medical history
- extent of the disease
- your baby's tolerance for specific medications, procedures, or therapies

- expectations for the course of the disease
- your opinion or preference

Treatment depends on many factors, including the cause of the jaundice and the level of bilirubin. The goal is to keep the level of bilirubin from increasing to dangerous levels. The treatment may include:

- ***Phototherapy***

Because bilirubin absorbs light, jaundice and increased bilirubin levels usually decrease when the baby is exposed to special blue spectrum lights. Phototherapy may take several hours to begin working and it is used throughout the day and night. The baby's position is changed to allow all of the skin to be exposed to the light. The baby's eyes must be protected and the temperature monitored during phototherapy. Blood levels of bilirubin are checked to monitor if the phototherapy is working

Note: Limit each time out from phototherapy to 30 minutes.

- ***Use of a Fiberoptic Blanket***

Another form of phototherapy is a fiberoptic blanket placed under the baby. This may be used alone or in combination with regular phototherapy.

- ***Exchange Transfusion***

Exchange transfusion may be used to replace the baby's damaged blood with fresh blood. This helps increase the red blood cell count and lower the levels of bilirubin. An exchange transfusion is done by alternating giving and withdrawing blood in small amounts through a vein or artery. Exchange transfusions may need to be repeated if the bilirubin levels remain high.

- ***Discontinued Breastfeeding***

Treatment of breast milk jaundice often requires stopping the breastfeeding for one to two days. Giving the baby formula often helps lower the bilirubin levels. Breastfeeding can then be resumed.

- ***Treatment of underlying conditions***

Treating any underlying cause of hyperbilirubinemia, such as infection.

Prevention of Jaundice:

While jaundice cannot be totally prevented, early recognition and treatment are important in preventing bilirubin levels from rising to dangerous levels. If your baby's color is turning more yellow, promptly call your baby's physician.

References:

American Academy of Pediatrics (AAP)

American Academy of Pediatrics - Immunization Information

Centers for Disease Control and Prevention (CDC) Early Hearing Detection and Intervention Program

Centers for Disease Control and Prevention - Childhood and Adolescent Immunization Schedule

International Board of Certified Lactation Consultant Examiners

International Certified Lactation Consultant Association

LeLeche League International

National Center for Hearing Assessment & Management

National Institute of Child Health and Human Development

US Consumer Product Safety Commission

Discharge Sheet

For Hospital Use Only

Dictation:

1-800-411-1001 (#963)

Discharge sheet FAXed to primary care physician (initial/date) _____

D/S Job #: _____

Follow-up appointment SCHEDULED with primary care physician (initial/date) _____

Patient's Name: _____

Discharge date: _____

Dx: 1) Hyperbilirubinemia

Hospital Course

Complications during hospitalization: _____

DISCHARGE CONDITION: _____

Admit T bili _____

Discharge T bili _____

Admit weight: _____

Discharge weight: _____

Instruction to Patient

Activity: Routine Newborn Care, indirect sunlight exposure until yellow skin color is gone.

Diet: Breast milk or formula on demand.

Medications: See Medication Reconciliation Form

Additional instructions:

Reference: Patient Education Sheet

Signed: _____ M.D.

Signature of Parent or Guardian

Attending Physician

Attending Resident

Primary Care Physician

City

Hyperbilirubinemia

0083



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Discharge Instructions