

# Jaundice - Newborn

Pediatric After-Hours Version

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## - DEFINITION -

\* Yellow color of the skin and whites of the eyes

## - INITIAL ASSESSMENT QUESTIONS -

1. COLOR: "What color is the jaundice?" "How deep is the color?" "Is your baby a lot more yellow than when last seen?"
2. EYES: "Does it involve the white parts of the eyes?"
3. LOCATION: "What part of the body is jaundiced?" "Does it involve the legs?"
4. ONSET: "On what day of life did you first notice your newborn was jaundiced?" (Days)
5. BILIRUBIN LEVEL DRAWN: "Has your baby had a bilirubin level drawn (blood test for jaundice)?"
6. SYMPTOMS: "Does your baby have any other symptoms?" If so, ask: "What are they?"
7. OUTPUT: "How many poops has your baby passed in the last 24 hours?" (Normal: 3 or more per day) "How many wet diapers have there been in the last 24 hours?"
8. FEEDING: "How is feeding going?" "How strong a feeder is your baby?"
9. BABY'S APPEARANCE: "How is your baby acting?"

## - BACKGROUND INFORMATION -

### TYPES OF JAUNDICE

Physiological jaundice (50% of newborns)

- \* Onset 2 to 3 days of age
- \* Peaks day 4 to 5 (Reason for recheck visits on these days)
- \* Disappears 1 to 2 weeks of age

Breastfeeding or malnutrition jaundice (5 to 10% of newborns)

- \* Due to inadequate intake of breastmilk
- \* Pattern similar to physiological type

Breast-milk jaundice (1% of newborns)

- \* Due to conjugation inhibitor in breastmilk that blocks destruction of bilirubin
- \* Onset 4 to 7 days of age
- \* Lasts 3 to 10 weeks
- \* Not harmful

Rh and ABO blood group incompatibility

- \* Onset during first 24 hours of life
- \* Can reach harmful levels

Liver Disease (rare)

- \* White or pale stools suggest biliary atresia or other obstructive liver disease as the cause of the jaundice.

### RECOGNIZING THE PRESENCE OF JAUNDICE

Sometimes callers aren't certain if the newborn's skin is jaundiced. Have them look at the sclera. If the sclera is white, the child is NOT jaundiced. The sclera always turns yellow at a lower bilirubin level than the skin. The color of the sclera is essential in assessing whether jaundice is present in babies with darkly pigmented skin or those who normally have a yellowish skin tone (some

Hispanics).

## PARENT ESTIMATION OF BILIRUBIN LEVEL

Parents are not qualified to judge the severity of jaundice. Even physicians and nurses are not consistently reliable. Therefore, if the caller thinks the jaundice is severe, the patient is seen now. If the caller thinks the jaundice is not deep yellow or orange, but they are concerned, the baby is seen within 24 hours. Trying to get the parent to be more specific about the degree of jaundice is unfair and potentially dangerous.

## ESTIMATES OF BILIRUBIN LEVELS USING ZONES OF DERMAL ICTERUS

Jaundice begins on the face of newborns and proceeds to the trunk, the extremities, and finally the palms and soles. The most distal zone of dermal icterus in this cephalopedal progression correlates with the level of serum bilirubin (Kramer, 1969). Once, the bilirubin stops rising, the progression of dermal icterus also stops. When the serum bilirubin falls, gradual fading of jaundice occurs on all skin surfaces simultaneously. The following correlations between the most distal body part that is jaundiced and the predicted level of bilirubin are interesting, but they do not substitute for an actual serum bilirubin.

- \* Head and neck 4-8
- \* Upper trunk 5-12
- \* Lower trunk and thighs 8-16
- \* Arms and lower legs 11-18
- \* Palms and soles > 15

## RISK FACTORS FOR SEVERE JAUNDICE

- \* Onset within first 24 hours of life
- \* Blood type incompatibility
- \* Gestational age 35-36 weeks or earlier
- \* Sibling required phototherapy
- \* Bruising from birth trauma (e.g., cephalohematoma)
- \* Breastfeeding

## KERNICTERUS PREVENTION

- \* Kernicterus (bilirubin encephalopathy) is the most serious complication of high bilirubin levels
- \* Early symptoms are lethargy, hypotonia, poor suck and high-pitched cry
- \* The US kernicterus registry reported 61 cases in term and near-term healthy newborns in 8 years (Johnson 2002)
- \* Bilirubin levels 22-48; 31% idiopathic, 31% G6PD, 10% hematomas
- \* Breastfed: 59 of 61 (increased risk for dehydration and malnutrition) (97%)
- \* Sequelae > 90% at 18 mo (cerebral palsy, developmental delays, hearing loss)
- \* Lapses in care: Only 28% were given an early follow-up appointment within 2-3 days of discharge. (AAP Practice Parameter 1994 and 2004 recommends any newborn discharged before 48 hours needs a check-up within 2-3 days of discharge for jaundice, weight, hydration, etc.)
- \* Mothers who phoned their doctor's office for jaundice, drowsiness, poor feeding, etc. received repeated reassurance rather than being seen

## SUNLIGHT THERAPY FOR JAUNDICE

- \* Sunlight that comes through a window can lower bilirubin levels, but the actual benefits have not been researched.
- \* This guideline does not recommend sunlight therapy because of the lack of proven benefits and the following potential harmful effects: [1] exposing the baby's uncovered back to sunlight gives a risk of rolling prone and suffocation AND [2] exposure to outdoor direct light could cause sunburn.
- \* Maisels (NEJM 2008) warns us: "Sunlight will lower the serum bilirubin level, but the practical

difficulties involved in safely exposing a naked newborn to the sun either inside or outside (and avoiding sunburn) preclude the use of sunlight as a reliable therapeutic tool”.

#### THE SICK NEWBORN: SUBTLE SYMPTOMS

- \* Newborn vulnerability: Newborns are a very high-risk age group, especially during the first 7 days of life. Over 90% of underreferrals that result in a serious adverse outcome involve newborns. Newborns with serious chronic diseases may look good at birth, but abruptly change during the first week of life. Examples are congenital heart disease and metabolic disease. Newborns are at special risk for sepsis and can deteriorate very rapidly.
- \* The symptoms of serious illness in newborns can be very subtle. That is why the statement '[1] Age < 1 month old (newborn) AND [2]starts to look or act sick in any way' is found in the 'See Immediately' category of at least 20 guidelines.
- \* Symptoms of illness in a newborn include the following:
  - \* Sleeping excessively
  - \* A sudden change in feeding behavior (has to be repeatedly awakened to nurse or can't stay awake for feedings)
  - \* Inability to sustain sucking or nursing
  - \* Sweating during feedings
  - \* Change in muscle tone (decreased or limp)
  - \* Decreased activity or movement
  - \* Change in color (ie pallor, cyanosis or gray extremities)
  - \* Fever or low temperature
  - \* Unusual crying, moaning, grunting
  - \* Tachypnea
  - \* Parent who calls back about the same concerns

Keep in mind that when a parent denies that their newborn is acting 'sick,' they may simply mean that the newborn doesn't have a cough, runny nose, or diarrhea. Always ask them, 'What's normal for your baby?', 'What's different (or abnormal)' and 'What is your baby doing right now?'

#### FIRST AID

N/A

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### **SEARCH WORDS**

BILIRUBIN  
 BREASTFEEDING JAUNDICE  
 BREAST-MILK JAUNDICE  
 JAUNDICE  
 JAUNDICED NEWBORN  
 LIVER DISEASE  
 NEWBORN JAUNDICE  
 ORANGE SKIN  
 PHYSIOLOGICAL JAUNDICE  
 YELLOW  
 YELLOW EYES  
 YELLOW OR ORANGE COLORED SKIN  
 YELLOW SCLERA  
 YELLOW SKIN  
 YELLOWING OF EYES

### **- TRIAGE -**

#### **Call EMS 911 Now**

Difficult to awaken or to keep awake  
 (EXCEPTION: child needs normal sleep)

*CA: 50, 7*

Shock suspected (very weak, limp, not moving, too weak to stand, pale cool skin)

*FIRST AID: have child lie down with feet elevated*

*CA: 50, 7*

Sounds like a life-threatening emergency to the triager

CA: 50, 7

**Go to ED Now**

[1] Age < 12 weeks AND [2] fever > 100.4 F (38.0 C) rectally

R/O: *sepsis, UTI*

CA: 51, 8, 7

**Go to ED Now (or PCP triage)**

Newborn starts to look or act sick in any way (e.g. decrease in activity)

R/O: *sepsis*

CA: 52, 7

Feeding poorly (e.g., little interest, poor suck, doesn't finish)

CA: 52, 7

Dehydration suspected (no urine > 8 hours, sunken soft spot, very dry mouth, etc.)

CA: 52, 7

[1] Purple (or blood-colored) spots or dots on skin AND [2] unexplained

R/O: *congenital infection*

CA: 52, 7

Low temperature < 96.8 F (36.0 C) rectally AND [2] doesn't respond to rewarming

R/O: *sepsis*

CA: 52, 7

**See Physician within 4 Hours (or PCP triage)**

Began during the first 24 hours of life

R/O: *hemolytic jaundice*

CA: 53, 9, 7

SEVERE jaundice (skin looks deep yellow or orange; legs are jaundiced)

R/O: *high bilirubin level*

CA: 53, 9, 7

HIGH-RISK baby for severe jaundice (preterm, ABO or Rh problem, cephalohematoma, sib needed bili-lights, etc)

CA: 53, 9, 7

**Call PCP Now**

Triager uncertain if baby needs urgent bilirubin test (e.g, more yellow than when last seen) (EXCEPTION: mild jaundice)

CA: 59, 11, 7

**See Physician within 24 Hours**

Good-sized yellow, seedy BMs per day are < 3  
(EXCEPTION: If breastfed, not expected while milk is coming in during 1-4 days of life)

*R/O: poor milk intake*

*CA: 54, 2, 3, 4, 10, 9, 7*

[1] Breastfed AND [2] day 2 to 4 of life AND [3] no BM in over 24 hours

*R/O: poor milk intake*

*CA: 54, 3, 4, 10, 9, 7*

[1] Breastfed AND [2] mother concerned the baby is not getting enough milk

*R/O: elevated bilirubin due to poor milk intake*

*CA: 54, 3, 4, 10, 9, 7*

Wet diapers per day are < 6

(EXCEPTION: If breastfed, 3 wet diapers/day can be normal while milk is coming in during 1-4 days of life)

*R/O: poor milk intake*

*CA: 54, 2, 3, 4, 10, 9, 7*

[1] Discharged before 48 hours of life AND [2] 4 or more days old AND [3] hasn't been examined since discharge

*Reason: AAP recommends re-check*

*CA: 54, 2, 3, 4, 10, 9, 7*

### **Call PCP within 24 Hours**

Caller is concerned about the degree of jaundice, but sounds MILD

*CA: 60, 2, 3, 4, 10, 9, 7*

[1] Had previous bilirubin level AND [2] jaundice worse , but sounds MILD

*Reason: PCP may decide to recheck bilirubin level*

*CA: 60, 2, 3, 4, 10, 9, 7*

### **See PCP When Office is Open (within 3 days)**

[1] > 7 days of age AND [2] the color becomes deeper

*Reason: not physiological jaundice*

*CA: 55, 2, 3, 4, 10, 9, 7*

[1] > 14 days of age AND [2] the jaundice is not gone

*R/O: breastmilk jaundice, liver disease, UTI*

*CA: 55, 2, 3, 10, 9, 7*

Jaundice began or reappears after 7 days of age

*R/O: liver disease*

*CA: 55, 2, 3, 10, 9, 7*

Stools (BMs) are white, pale yellow or light gray

*R/O: neonatal hepatitis, biliary atresia*

*CA: 55, 2, 3, 10, 9, 7*

### **Home Care**

Mild jaundice of newborn (all triage questions negative)

CA: 58, 1, 2, 3, 4, 10, 5, 6, 7

### - CARE ADVICE (CA) -

1. REASSURANCE: Some jaundice is present in 50% of newborns. It is usually temporary and harmless.
2. BOTTLEFED: If bottlefed, increase the frequency of feedings. Try for an interval of every 2 to 3 hours during the day
3. BREASTFED: If breastfed, increase the frequency of feedings. Nurse your baby every 1-1/2 to 2-1/2 hours during the day. Don't let your baby sleep more than 4 hours at night without a feeding. (Reason: increased BMs carry more bilirubin out of the body)
4. INCREASE BMS: If your baby is 5 days or older AND has < 3 BMs/day, carefully insert a lubricated thermometer 1/2 inch (12 mm) into the anus and gently move it from side to side a few times to stimulate a BM. (Reason: BMs carry bilirubin out of the body). Do this once or twice per day until jaundice improves or stool frequency becomes normal.
5. EXPECTED COURSE: Physiological jaundice peaks on day 4 or 5 and then gradually disappears over 1-2 weeks.
6. CALL BACK IF
  - Jaundice becomes worse
  - Legs becomes yellow
  - Jaundice not gone by day 14
  - Baby is not getting enough milk (needs a weight check)
  - Baby starts to act sick
7. CARE ADVICE given per Jaundice - Newborn (Pediatric) guideline.
8. FEVER AND < 3 MONTHS OLD: Don't give any acetaminophen before being seen. Need accurate documentation of temperature in medical setting to decide if fever is really present. (Reason: may require septic work-up)
9. CALL BACK IF
  - Jaundice becomes worse
  - Legs becomes yellow
  - Your baby starts to act sick
10. JUDGING JAUNDICE:
  - Jaundice starts on the face and moves downward. Try to determine where it stops.
  - View your baby unclothed in natural light near a window.
  - Press on the yellow skin with a finger to remove the normal skin tone.
  - Then assess the jaundice color before the pink color returns.
11. CALL BACK IF:
  - Your baby starts to act sick
50. CALL EMS 911 NOW: Your child needs immediate medical attention. You need to hang up and call 911 (or an ambulance). (Triager Discretion: I'll call you back in a few minutes to be sure you were able to reach them.)
51. GO TO ED NOW: Your child needs to be seen in the Emergency Department immediately. Go to the ER at \_\_\_\_\_ Hospital. Leave now. Drive carefully.

52. GO TO ED NOW (or PCP triage)  
IF NO PCP TRIAGE: Your child needs to be seen within the next hour. Go to the ER/UCC at \_\_\_\_\_ Hospital. Leave as soon as you can.  
IF PCP TRIAGE REQUIRED: Your child may need to be seen. Your doctor will want to talk with you to decide what's best. I'll page him now. If you haven't heard from the on-call doctor within 30 minutes, or your child becomes worse, go directly to the ER/UCC) at \_\_\_\_\_ Hospital.
53. SEE PHYSICIAN WITHIN 4 HOURS (or PCP triage)  
IF NO PCP TRIAGE: Your child needs to be seen. Go to \_\_\_\_\_ (ED/UCC or office if it will be open) within the next 3 or 4 hours. Go sooner if your child becomes worse.  
IF PCP TRIAGE REQUIRED: Your child may need to be seen. Your doctor will want to talk with you to decide what's best. I'll page him now. If you haven't heard from the on-call doctor within 30 minutes, call again. (Note: If PCP can't be reached, send to ED/UCC or office.)
54. SEE PHYSICIAN WITHIN 24 HOURS  
IF OFFICE WILL BE OPEN: Your child needs to be examined within the next 24 hours. Call your child's doctor when the office opens, and make an appointment.  
IF OFFICE WILL BE CLOSED AND NO PCP TRIAGE:  
Your child needs to be examined within the next 24 hours. Go to \_\_\_\_\_ at your convenience.  
IF OFFICE WILL BE CLOSED AND PCP TRIAGE REQUIRED:  
Your child may need to be seen within the next 24 hours. Your doctor will want to talk with you to decide what's best. I'll page him now. (EXCEPTION: from 10 pm to 7 am. Since this isn't serious, we'll hold the page until morning.)
55. SEE PCP WITHIN 3 DAYS: Your child needs to be examined within 2 or 3 days. Call your child's doctor during regular office hours and make an appointment.
56. SEE PCP WITHIN 2 WEEKS: Your child needs an evaluation for this ongoing problem within the next 2 weeks. Call your child's doctor during regular office hours and make an appointment.
57. FOLLOW-UP: Discuss \_\_\_\_\_ with your child's doctor at the next regular office visit (Call sooner if you become more concerned.)
58. HOME CARE: You should be able to treat this at home.
59. CALL PCP NOW: You need to discuss this with your child's doctor. I'll page him now. If you haven't heard from the on-call doctor within 30 minutes, call again.
60. CALL PCP WITHIN 24 HOURS: You need to discuss this with your child's doctor within the next 24 hours.  
IF OFFICE WILL BE OPEN: Call the office when it opens tomorrow morning.  
IF OFFICE WILL BE CLOSED: I'll page him now. (EXCEPTION: from 9 pm to 9 am. Since this isn't urgent, we'll hold the page until morning.)
61. CALL PCP WHEN OFFICE IS OPEN: You need to discuss this with your child's doctor within the next few days. Call him/her during regular office hours.

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**Content Set:** Telephone Triage Algorithms - Pediatric After-Hours Version  
**Version Year:** 2008  
**Last Revised:** 6/17/2008  
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