

## DOCUMENT CONTROL

<b>Title</b>			
<b>Term Neonatal Jaundice Assessment Guidelines</b>			
<b>Author</b>			<b>Author's job title</b>
			Lead Nurse Neonatal and Paediatric Services
<b>Directorate</b>			<b>Department</b>
Women and Childrens			Neonatal and Paediatric
<b>Version</b>	<b>Date Issued</b>	<b>Status</b>	<b>Comment / Changes / Approval</b>
0.1	Feb 2017	Draft	Initial Version for Consultation
0.2	May 2018	Revised	Revised including comments
1.0	May 2018	Final	Approved by Paediatric Specialty Team 18 <sup>th</sup> May 2018
1.1	Aug 18	Revised	Changes following comments from maternity services
<b>Main Contact</b>			<b>Tel: Direct Dial</b>
Ladywell Dept North Devon District Hospital Raleigh Road Barnstaple, North Devon, EX31 4JB			<b>Tel: Internal</b>
			<b>Email:</b>
<b>Lead Director</b>			
Director of Women and Childrens			
<b>Document Class</b>			<b>Target Audience</b>
Guidelines			Midwives, Neonatal and Paediatric Nurses. Paediatricians
<b>Distribution List</b>			<b>Distribution Method</b>
Maternity Services Neonatal and Paediatric Services Point of care Testing/Pathology Services			Trust's internal website
<b>Superseded Documents</b>			
Term Neonatal Jaundice Assessment Guidelines v1.0			
<b>Issue Date</b>		<b>Review Date</b>	
Aug 2018		May 2021	
		<b>Review Cycle</b>	
		Three years	
<b>Consulted with the following stakeholders</b>			<b>Contact responsible for implementation and monitoring compliance:</b>
<ul style="list-style-type: none"> <li>• Point of Care testing</li> <li>• Maternity Services</li> <li>• Neonatal Services</li> </ul>			Lead Midwife for Maternity Outpatients & Public Health
			<b>Education/ training will be provided by:</b>
			Midwives/Neonatal Staff
<b>Approval and Review Process</b>			
<ul style="list-style-type: none"> <li>• Maternity Services Guidelines Group and Paediatric Specialist Team Meeting</li> </ul>			

**Local Archive Reference**

G:\Paediatric Resources\Neonates\Neonatal guidelines\Previous versions of guidelines

**Local Path**

G:\Paediatric Resources\Neonates\Neonatal guidelines folder

**Filename**

Term Neonatal Jaundice Assessment Guidelines

**Policy categories for Trust's internal website (Bob)**

Maternity/Paediatrics/Neonatal

**Tags for Trust's internal website (Bob)**

kernicterus, transcutaneous bilirubinometer, serum bilirubin, hyperbilirubinaemia, phototherapy

## CONTENTS

---

<b>1.</b>	<b>Background .....</b>	<b>4</b>
<b>2.</b>	<b>Purpose.....</b>	<b>4</b>
<b>3.</b>	<b>Responsibilities .....</b>	<b>4</b>
<b>4.</b>	<b>Definitions.....</b>	<b>5</b>
<b>5.</b>	<b>Essential Key Points .....</b>	<b>5</b>
<b>6.</b>	<b>Identification.....</b>	<b>6</b>
<b>7.</b>	<b>Jaundice assessment in the community/home or on the post natal ward .....</b>	<b>7</b>
<b>8.</b>	<b>Jaundice observed in Babies of &lt;24 hours of age .....</b>	<b>8</b>
<b>9.</b>	<b>Jaundice observed in Babies from 24 hours - to 14 days of age.....</b>	<b>8</b>
<b>10.</b>	<b>Results according to bilirubin levels .....</b>	<b>8</b>
<b>11.</b>	<b>Treatment Threshold Graphs .....</b>	<b>9</b>
<b>12.</b>	<b>When to repeat bilirubin level for 38 week and above babies .....</b>	<b>9</b>
<b>13.</b>	<b>Using a transcutaneous bilirubinometer (TCB).....</b>	<b>10</b>
<b>14.</b>	<b>Use of SBR.....</b>	<b>10</b>
<b>15.</b>	<b>Parent/Carer Information .....</b>	<b>10</b>
<b>16.</b>	<b>Monitoring Compliance with and the Effectiveness of the Guideline .....</b>	<b>11</b>
<b>17.</b>	<b>Process for Implementation and Monitoring Compliance and Effectiveness .....</b>	<b>11</b>
<b>18.</b>	<b>References .....</b>	<b>12</b>
<b>19.</b>	<b>Associated Documentation .....</b>	<b>12</b>
	<b>Appendix One – Maternity Services SBAR follow up tool for referral of Term Infants with Jaundice</b>	
	<b>13</b>	
	<b>Appendix Two – Treatment thresholds for 37 and 38 week gestation babies. ....</b>	<b>14</b>
	<b>Appendix Three - Jaundice in babies less than 14 days: Quick Reference Guide.....</b>	<b>16</b>
	<b>Appendix Four – Flow chart for Bilirubin Assessment of Term Infants ≥ 37 weeks gestation .....</b>	<b>17</b>

## 1. Background

- 1.1. This guideline outlines the process for the identification and management of neonatal jaundice in babies from 37 weeks gestation or above who are not already admitted to the neonatal unit and in the community, maternity or paediatric setting.
- 1.2. Jaundice is very common and develops in approximately 60% of term and 80% of preterm infants in the first week of life. Physiological jaundice commonly appears about the third day of life and fades from day seven onwards, therefore any infant who appears jaundiced in the first 24 hours of life requires investigation. This is because a pathological cause is likely and needs excluding.
- 1.3. Jaundice is harmless at low levels. Kernicterus occurs at very high levels of unconjugated bilirubin and treatment is required to prevent this.

## 2. Purpose

- 2.1. The Guideline has been written to:
  - Identify the procedures for the assessment of Neonatal Jaundice for Term Neonates in maternity, paediatric and the community setting.

## 3. Responsibilities

- 3.1. This Guideline relates to the following staff groups who may be involved in the assessment and delivery of Neonatal care on the wards and in the community setting
  - Registered Midwives
  - Registered nurses
  - Support workers
  - Paediatric Medical staff
- 3.2. Registered midwives, nurses, medical staff and support workers should assess the neonates for jaundice at every opportunity making informed decisions on the need for testing for bilirubin levels making and whether a referral to the Paediatric department is necessary.
- 3.3. This Guideline for Management of Neonatal Jaundice at Term can be implemented in all areas where competent staff are available to undertake this role.
- 3.4. Staff undertaking this procedure must be able to demonstrate continued competence as per the organisations policy on assessing and maintaining competence.

## 4. Definitions

- 4.1. **Jaundice** is caused by deposits of bilirubin causing a yellow discolouration of the skin and sclera.
- 4.2. **Significant jaundice.** Jaundice is defined as significant once the unconjugated bilirubin is on or above the treatment threshold (identified by NICE Neonatal jaundice CG98).
- 4.3. **Kernicterus** is the neurological consequences of unconjugated bilirubin passing across the blood-brain barrier and depositing in the basal ganglia. Acute symptoms include encephalopathy, with abnormal posturing and fits. Chronic effects include athetoid cerebral palsy, vision and hearing loss.
- 4.4. **Pathological hyperbilirubinemia.** This is jaundice which occurs in the first 24 hours post birth. The cause of which is not part of the normal newborn physiological process.
- 4.5. **Physiological hyperbilirubinemia.** This is jaundice which occurs as the result of a build up of bilirubin due to the normal haemolysis of red blood cells that were needed for foetal circulation before birth, but are discarded afterwards.

**Phototherapy** is used to reduce serum bilirubin levels by inducing a change in the molecular structure of the bilirubin molecule to a water soluble, more easily excretable form that cannot cross the blood brain barrier.

- 4.6. **Prolonged Jaundice** is visible jaundice persisting beyond day 14 in term neonates or persisting beyond day 21 in preterm infants (born at less than 37 weeks gestation).
- 4.7. **SBR** = serum bilirubin level
- 4.8. **TCB**= transcutaneous bilirubin level
- 4.9. **TBM** = transcutaneous bilirubinometer. This monitor is used as a screening device for jaundice in the newborn. When TBM results are above agreed thresholds this will indicate that a serum bilirubin is required (SBR)
- 4.10. **Unconjugated Bilirubin.** This is bilirubin which is bound to albumin in the blood and is not water soluble as it has not yet been converted within the liver into a water soluble form, therefore it cannot be excreted in the urine.

## 5. Essential Key Points

The essential elements of this guideline are:

- 5.1. **Jaundice under 24 hours old:**

Jaundice in the first 24 hours must be considered as pathological and these babies must have an SBR and a paediatric review within **2 hours** of identification.

## 5.2. Jaundice over 24 hours old:

Measure and record the bilirubin level within **6 hours** of identification.

Do not rely on visual inspection alone to estimate the bilirubin level in a baby with jaundice.

Interpret results of TCB in line with the flowchart in [appendix 3](#).

Ensure all results are plotted on the correct chart for the baby's gestation at birth.

Although these babies are more likely to have physiological jaundice, they still require a robust review in order to establish if pathological causes, such as sepsis, can be excluded.

## 6. Identification

### 6.1. Risk Factors for Neonatal Jaundice

Babies at increased risk of developing jaundice must be identified.

Risk Factors:

- Blood group incompatibility (always refer for paediatric assessment)
- Bruising/vacuum extraction/cephalhaematoma
- Gestation under 38 weeks
- A sibling with jaundice that required phototherapy
- Inadequate feeding/excessive weight loss
- Exclusive breastfeeding
- East Asian Race

Check for these factors soon after birth and ensure these babies, for example an exclusively breast fed baby, receive an additional visual (face-to-face) inspection by a healthcare professional within the first 48 hours of life, (NICE 2010).

### 6.2. Inspection for neonatal jaundice

The clinical recognition and assessment of jaundice can be difficult, particularly in infants with dark skin tones.

**Examine the baby for jaundice at every opportunity, especially in the first 72 hours.**

All babies with associated risk factors should be examined by a health care professional in the first 48 hours of life.

When looking for jaundice (visual inspection):

- Check the naked baby in bright and preferably natural light
- Examination of the sclerae, gums and blanched skin is useful across all skin tones.

- Jaundice usually appears first in the head and descends through the thorax to the lower limbs.

If there is any visible jaundice check bilirubin levels. Do not rely on visual inspection alone in jaundiced babies. Generally the bilirubin has to be >100 micromol/L to cause clinically visible jaundice.

In all babies, check whether there are risk factors (see above) associated with an increased likelihood of developing significant hyperbilirubinaemia soon after birth.

**All postnatal reviews should routinely include assessment for neonatal jaundice.**

## 7. Jaundice assessment in the community/home or on the post natal ward

Babies observed to have jaundice will either be assessed and have their levels monitored by midwives in the community/home or, (according to location) will be asked to bring their baby on to Bassett post natal ward NDDH for review. (Follow quick reference guide [appendix three](#) and flow chart [appendix four](#))

**Do not rely on visual inspection alone to estimate the extent of jaundice.**

- 7.1. Document all assessment and risk factors, observations for jaundice, bilirubin results, graphs and decision-making in the purple post natal notes.

If a decision is made to admit the baby to the paediatric ward for treatment then documentation is completed in the baby's medical notes.

- 7.2. Take bilirubin assessment by most appropriate method (see Point 13 regarding appropriate use of a TBM) and plot on the correct threshold chart according to gestational age and hours following birth ([see point 10](#)).

- 7.3. Evaluate feeding and highlight any concerns. Please ensure a full breastfeeding assessment is carried out using the form provided in the p14 maternal purple postnatal notes. Or follow link. <https://www.unicef.org.uk/babyfriendly/wp-content/uploads/sites/2/2016/08/Baby-Friendly-breastfeeding-assessment-form-red-book-p6.pdf>

- 7.4. Complete NEWS observations

- 7.5. If there are any concerns regarding feeding or there are any other concerns/risk factors weigh infant and calculate % weight loss from birth (if any), (see excessive weight loss in the healthy breastfed newborn guideline).

- 7.6. Follow flow chart for bilirubin assessment (appendix four)

Plan and document any further assessments according to the flow chart.

- 7.7. The SBAR follow up/review tool may be used ([appendix one](#)).
- 7.8. If the baby requires treatment (according to the threshold chart) or there are any other concerns/risk factors refer to Paediatric medical team for joint assessment and review.

Documentation of the decision-making of this escalation for treatment will then be written in the baby's medical notes and the baby will be admitted for treatment to the paediatric ward/post-natal ward. (see Jaundice Management Guidelines for Neonates)

## 8. Jaundice observed in Babies of <24 hours of age

Jaundice in the first 24 hours must be considered as pathological and the most likely causes are isoimmunisation or sepsis.

**Babies under 24 hours of age with visible jaundice must be referred to Paediatric Medical team for management review within 2 hours.**

**Do not rely on visual inspection alone to estimate the extent of jaundice.**

## 9. Jaundice observed in Babies from 24 hours - to 14 days of age

All babies over 24 hours of age with visible jaundice must have their bilirubin level assessed within 6 hours. This can be achieved by transcutaneous bilirubinometer (TCB) or by a serum bilirubin blood (SBR) test.

Although these babies are more likely to have physiological jaundice, they still require a robust review in order to exclude pathological causes such as sepsis.

**Any baby with a TCB reading greater than 250  $\mu\text{mol/L}$  must have an SBR (NICE 2010)**

Do not rely on visual inspection alone to estimate the extent of jaundice.

## 10. Results according to bilirubin levels

- 10.1. All TCB/SBR levels will be plotted on the correct chart for the baby's gestation. Note that 'term' babies are divided into 37 weeks gestation, and  $\geq 38$  weeks gestation
- 10.2. Ensure correct gestational age of the baby, using the due date generated from the 12 week scan, before printing a gestational age appropriate Treatment Threshold Graph or consulting the Threshold Table.

- 10.3. Using the age of the baby in hours and the SBR result, refer to the appropriate Threshold Table to determine management.
- 10.4. Appendix Two – Treatment thresholds for 37 and 38 week gestation babies.
- 10.5. Babies with TCB greater than 250  $\mu\text{mol/L}$  or, on or above the treatment threshold require an SBR. For babies coming in from the community this will occur on Bassett post natal ward.
- 10.6. If treatment is required the baby will be admitted as an in-patient to Caroline Thorpe Paediatric ward.

## 11. Treatment Threshold Graphs

- NICE neonatal threshold charts for jaundice are found at:  
<https://www.google.co.uk/url?url=https://www.nice.org.uk/guidance/cg98/evidence/treatment-threshold-graphs-245372941&rct=j&frm=1&q=&esrc=s&sa=U&ved=0ahUKEwiOvPHvp4rSAhXpAMAKHU3DBcQFggUMAA&usg=AFQjCNFS8hASdpzp9DEtrXPjtigQsFdLbQ>

**Note – Always use correct chart according to gestational age.**

## 12. When to repeat bilirubin level for 38 week and above babies

### 12.1. Babies well and within 50 micromol/litre of the threshold table

In babies who are clinically well, have a gestational age of 38 weeks or more and are more than 24 hours old, and who have a bilirubin level that is below the phototherapy threshold but within 50 micromol/litre of the threshold (see the threshold table and the treatment threshold graphs from the CG98 full guideline), repeat bilirubin measurement as follows:

- within 18 hours for babies with risk factors for neonatal jaundice (those with a sibling who had neonatal jaundice that needed phototherapy or a mother who intends to exclusively breastfeed).

*If a repeat measurement within 18 hours is difficult to achieve then consider doing it at less than 18 hours or make an individual plan after consulting with the paediatric team. Document the rationale for this.*

- within 24 hours for babies without risk factor

### 12.2. Babies well and below 50 micromol/litre of the threshold table

In babies who are clinically well, have a gestational age of 38 weeks or more and are more than 24 hours old, and have a bilirubin level that is below the phototherapy threshold by more than 50 micromol/litre (see the threshold table and the treatment threshold graphs from the CG98 full guideline), do not routinely repeat bilirubin measurement.

## 13. Using a transcutaneous bilirubinometer (TCB)

One TCB will be located in the Ladywell unit and others in some areas in the community

- Transcutaneous bilirubinometry is used for non-invasive estimation of bilirubin in neonates.
- Paediatric Medical Staff, Midwives, Neonatal Nurses and Support Workers who have completed the relevant medical devices competency assessment can use the bilirubinometer in the following babies

### **TCB can be used in these instances**

#### **The Infant:-**

- **Is More than 35 weeks gestation**
- **Is More than 24 hours of age**
- **Is Less than 14 days of age** (above this age conjugated hyperbilirubinaemia should be ruled out by an SBR)
- **Has not had phototherapy**
- **Has not had an exchange transfusion**

Note: if the TCB displays a blinking -0- this indicates that the result is higher than the measuring range of the device (over 340  $\mu\text{mol/L}$ ), (Drager 2018).

## 14. Use of SBR

- Venous or capillary blood samples may be used. Collect 0.5ml in brown/gold serum gel bottle and send to path lab immediately via porter. Call biochemist out of hours to advise of sample requiring testing.
- If blood samples are taken during phototherapy ensure that the lights are switched off whilst you are taking the sample to ensure accuracy of result.

### **Use serum bilirubin to check levels in these instances:**

- **If a transcutaneous bilirubinometer (TCB) is not available**
- **Infant is 35 weeks or less corrected gestational age**
- **Infant is  $\leq$  24 hours old**
- **Infant is More than 14 days of age**
- **TCB is more than 250**
- **TCB is at or above the relevant treatment threshold for their postnatal age**
- **TCB displays a blinking -0-**

## 15. Parent/Carer Information

15.1. Parents/carers should be given written and verbal information.

- 15.2.** Parents may be given NDHCT information on Jaundice in Newborn Infants. Alternatively NICE parent/care information can be downloaded from <https://www.nice.org.uk/guidance/cg98/resources/parent-information-factsheet-245370349>

## **16. Monitoring Compliance with and the Effectiveness of the Guideline**

- 16.1.** Key Performance indicators on which to base care in the Special Care Unit are:

- Nice Neonatal Quality Standards  
[NICE guideline and Standards for Neonatal jaundice CG98, May 2010](#)
- NHS Toolkit for High Quality Neonatal Services
- National Neonatal Audit Programme
- NHS Standard Contract for Neonatal Critical Care

## **17. Process for Implementation and Monitoring Compliance and Effectiveness**

- 17.1.** All staff who assess babies for jaundice are informed of any new/revised documentation. There is an expectation that staff are responsible to keep updated on any improvements to practice and deliver care accordingly.
- 17.2.** Education will occur during ward education days, sim scenarios, completion of competencies, and neonatal preceptorship, ward meetings, Maternity MDT and one-to-one mentoring/supervision.
- 17.3.** Case reviews may be presented and discussed in Maternity MDT meetings.
- 17.4.** Any error or incident or non-compliance will be reported in accordance with NDHT Incident Management and Investigation Policy. Where non-compliance is found, it must have been documented in the patient's medical notes. Non-adherence is investigated and action plans made if required. Discussion and reviews occur at Directorate meetings, Governance meetings and Ward meetings. Learning and action plans are cascaded at these meetings and improvements implemented. Key findings and learning points will be disseminated to relevant staff.

## 18. References

- 18.1. Dräger (2018). Safety notice JM-105.
- 18.2. Dräger Jaundice Meter JM – 105 Manufacturer's Instructions
- 18.3. Royal Devon and Exeter Clinical Guideline (2015). Management of neonatal jaundice at term
- 18.4. NICE (2016). Neonatal Jaundice – Phototherapy Pathway. [on-line] <https://www.google.co.uk/url?url=https://pathways.nice.org.uk/pathways/neonatal-jaundice/neonatal-jaundice-phototherapy.pdf&rct=j&frm=1&q=&esrc=s&sa=U&ved=0ahUKEwiZm8-N1orSAhVFF8AKHZwjDQwQFggkMAI&usg=AFQjCNHidl1Kpu8Y61ed8gC-LOEYNMfABg> (accessed 12/2/17)
- 18.5. NICE Jaundice in Newborn babies: information for parents and carers. [on-line] <https://www.nice.org.uk/guidance/cg98/resources/parent-information-factsheet-245370349> (accessed 12/2/17)
- 18.6. NICE 2010 [on-line] Guideline for Neonatal jaundice CG98. <https://www.nice.org.uk/guidance/cg98> (Accessed 12/2/17).

## 19. Associated Documentation

- 19.1. NDHCT Capillary Blood Sampling Guidelines for Neonates
- 19.2. NDHCT Competency for use of Dräger Jaundice Meter JM – 105
- 19.3. NDHCT Excessive Weight Loss in the Healthy Breastfed Newborn Guideline
- 19.4. NDHCT Exchange Transfusion Guidelines for Neonates
- 19.5. NDHCT Guideline for management of Jaundice
- 19.6. NDHCT Jaundice in Newborn Infants Parent Information
- 19.7. NDHCT Jaundice Management guidelines for Neonates
- 19.8. NDHCT Newborn Infant Feeding Policy
- 19.9. Virgincare (2016). Local Standard Operating Protocol for Management of jaundice in infants



## Appendix Two – Treatment thresholds for 37 and 38 week gestation babies.

### Treatment threshold graph for babies with neonatal jaundice

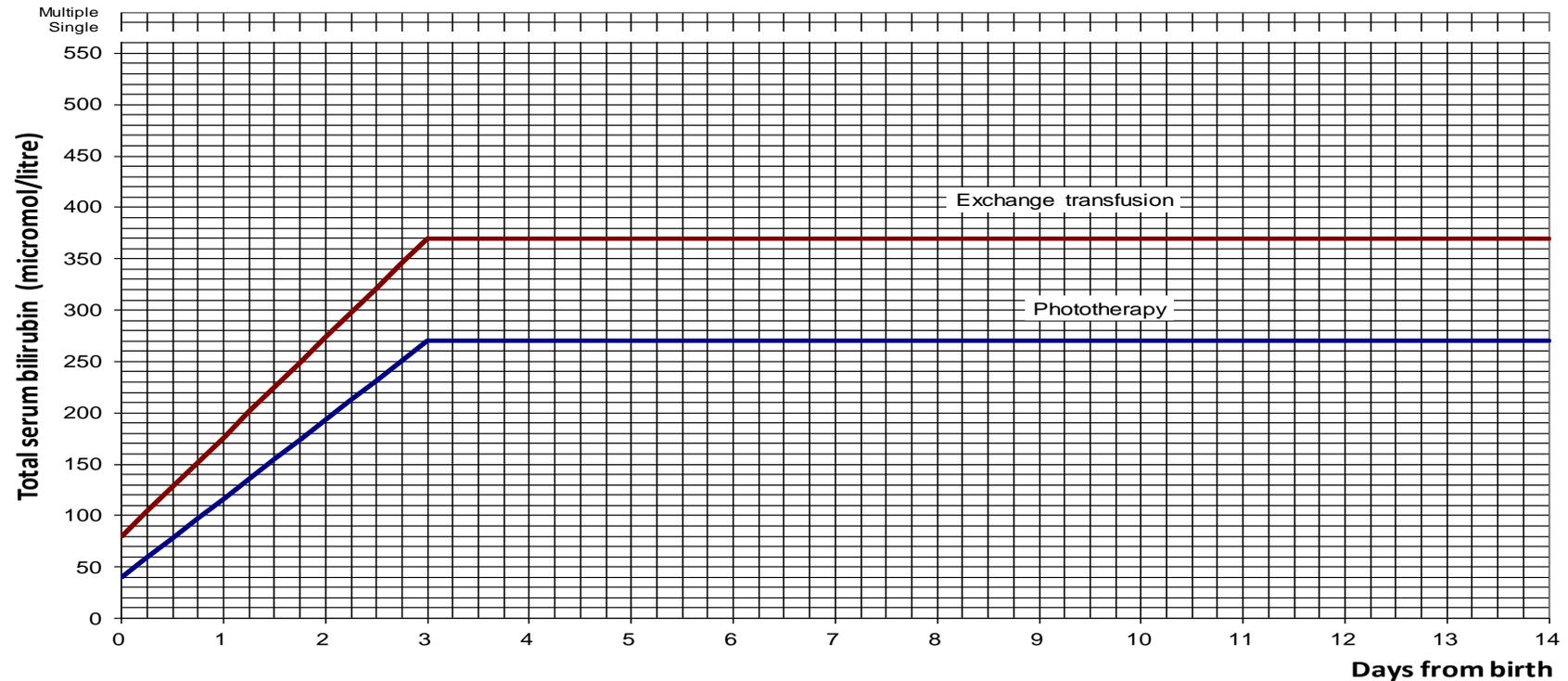
**NHS**  
National Institute for  
Health and Clinical Excellence

Baby's name \_\_\_\_\_ Date of birth \_\_\_\_\_

Hospital number \_\_\_\_\_ Time of birth \_\_\_\_\_ Direct Antiglobulin Test \_\_\_\_\_

Shade for phototherapy \_\_\_\_\_ Baby's blood group \_\_\_\_\_ Mother's blood group \_\_\_\_\_

Click below and choose gestation  
**37** weeks gestation



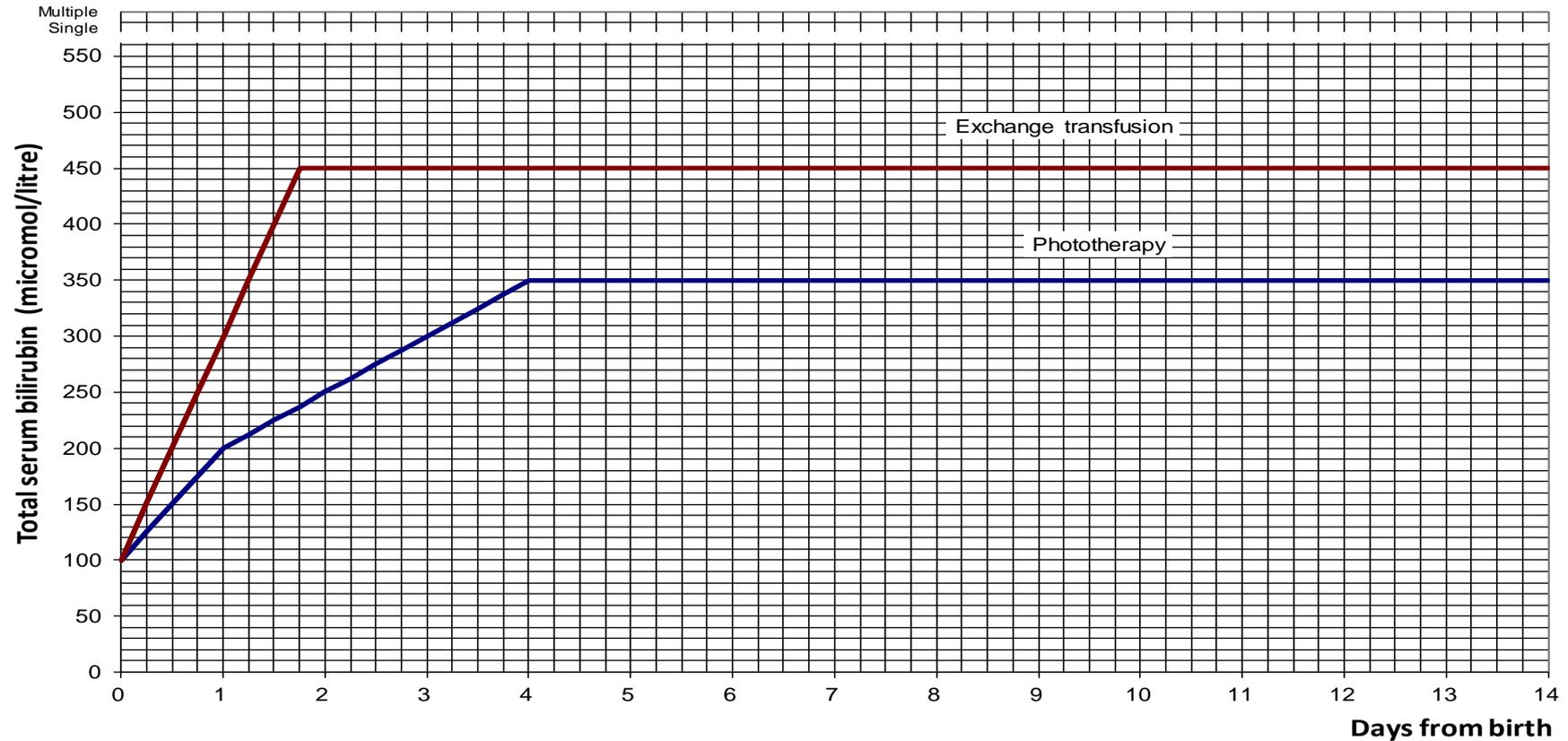
### Treatment threshold graph for babies with neonatal jaundice

Baby's name \_\_\_\_\_ Date of birth \_\_\_\_\_

Hospital number \_\_\_\_\_ Time of birth \_\_\_\_\_ Direct Antiglobulin Test \_\_\_\_\_

Shade for phototherapy \_\_\_\_\_ Baby's blood group \_\_\_\_\_ Mother's blood group \_\_\_\_\_

Click below and choose gestation  
**>=38** weeks gestation



## Appendix Three - Jaundice in babies less than 14 days: Quick Reference Guide

Every baby less than two weeks old who is visibly jaundiced requires TCB or SBR.

**If the baby is jaundiced at less than 24 hours old they require urgent paediatric review emergency WITHIN TWO HOURS (SCBU doctor, bleep 270; or on call registrar, bleep 341).**

If more than 24 hours old the baby should be referred to Bassett Ward for jaundice assessment by midwifery team within six hours. (This assessment can also be achieved in the community if the TBM is available). This should include TCB, feeding assessment and NEWS observations.

If there are any concerns regarding feeding or there are any other concerns/risk factors weigh infant and calculate % weight loss from birth (if any), (see excessive weight loss in the healthy breastfed newborn guideline).

A TCB can be performed in the following babies:

- More than 24 hours old
- Less than 14 days old
- Corrected gestation more than 35 weeks
- Never had phototherapy

The TCB result should be plotted on the baby's gestation-specific chart and interpreted in line with the TCB interpretation flow chart.

An SBR blood test should be taken if:

- TCB is unsuitable for this baby
- TCB reading is on/above the phototherapy line, or above 250  $\mu\text{mol/L}$  regardless of proximity to the line.

If there are concerns regarding feeding, or the NEWS observations, or the baby has lost significant weight, or the baby appears unwell, they should be referred for paediatric medical assessment (SCBU doctor, bleep 270). The SBAR tool may be used.

If the SBR is on or above the treatment line the baby should be admitted to Caroline Thorpe or Bassett ward for treatment.

If the TCB reading is close to the exchange transfusion line, phototherapy should be commenced prior to receiving the SBR result from the lab. The paediatrics team should be involved. This will mean a TCB cannot be used again on this baby (as they cannot be used on babies who have had phototherapy) which will mean repeated blood testing on the baby.

If pressure of work for midwifery team is too high to facilitate high-quality care for these neonates, the case can be referred to the SCBU doctor on bleep 270. This should be avoided where possible to avoid over-medicalisation of this physiological process.

## Appendix Four – Flow chart for Bilirubin Assessment of Term Infants ≥ 37 weeks gestation

