Neonatal Jaundice Management

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 **Charts**

Note bilirubin charts:

Bilirubin chart 24-34 weeks

Bilirubin chart 35 weeks and above with TCB guide

**Neonatal Jaundice**   **NICE Clinical Guideline Number 98**

**Scope**

This guideline covers the management of babies with jaundice in the first weeks of life in maternity, community and paediatric settings. The phototherapy service supported by the ACE team is covered in a separate guideline.

**Background**

Jaundice in babies is extremely common. Many term infants and almost all preterm infants become visibly jaundiced during the first week of life. Babies are born with immature enzymes in the liver, a high burden of red blood cells and increased intestinal reabsorption of bilirubin. This combination means that all babies have a transient rise in their serum bilirubin over the first days of life usually peaking around day 4 and settling during the 2nd week of life.

A wide range of factors can make individual babies more likely to develop significant jaundice. It is particularly important to be aware of babies who are born preterm, babies who have had a sibling with neonatal jaundice requiring treatment and babies who are exclusively breast fed. Excellent support to all women who intend to breast feed is extremely important.

**Babies identified as potentially at high risk of haemolytic jaundice before birth**

There are a number of babies whom are deemed at a higher risk of haemolytic jaundice due to the antibody profile of the mother.

Maternal anti D titres greater than 20 signify a higher level of risk (rhesus haemolytic disease). For other antibodies the titre does not necessarily correlate with the level of risk to the baby but the report from blood transfusion in mother’s record may give some indication. Antenatal plan may indicate need to involve neonatal team in timing of delivery.

When a risk of haemolytic disease has been identified cord bloods must be taken immediately after birth and sent for a group and DCT (direct Coombs test), FBC and bilirubin. For babies where only a low risk of haemolysis is identified, a FBC and bilirubin may not be needed.

Baby should be seen at birth to assess general condition / clinical jaundice / anaemia / hepatosplenomegaly etc. It is the midwifery teams’ job to take the samples and send them urgently to the lab. **As a neonatal team our role is expedite the processing of high risk samples ie those where the risk of HDN is more than “low”**. The transfusion lab receives hundreds of samples each day, we need to call them on 4204 and identify samples which need processing urgently.

If the DCT result is positive, in a baby who was identified as high risk of haemolysis, or who has other features suggestive of ongoing haemolysis:

* Check a transcutaneous bilirubin and consider a blood gas to get a (not always accurate) gas machine bilirubin, and Hb.
* Ensure a generous recent sample for bilirubin is in progress, or that you know the result. Plan further testing.
* Admit to TCU or NNU for immediate intensive double surface phototherapy.
* If unsure, discuss with seniors.

It is important to separate the above babies from rarely significant, often weakly +ve DCT in Rhesus +ve babies of Rhesus-ve women where only exposure is to antenatal prophylactic Anti D – routine investigation in these babies is NOT needed unless clinically jaundiced.

**Babies with visible jaundice in the first 24 hours NICE guidance section 4.1**

Jaundice within the first day is an important, urgent problem. Medical review is needed – phone the neonatal team – don’t wait for their next routine visit. In addition to clinical assessment a blood test to measure serum bilirubin urgently is always needed and must be plotted on the appropriate chart at the exact age in hours that the blood sample was taken.

Babies with visible jaundice in the first 24 hours who are already at home should be referred back to paediatrics urgently for assessment. It is not appropriate for the community midwife to just check a bilirubin as the time taken to obtain the result may delay urgently needed treatment.

Transcutaneous bilirubin measurement should never be used in the first 24 hours of life.

**Care of babies more than 24 hours old NICE guidance section 5.1**

Babies with visible jaundice after the first 24 hours should have a bilirubin level recorded. On the postnatal ward this is the responsibility of the midwife. For babies of 35 weeks’ gestation or more a transcutaneous bilirubinometer (TCB) can be used and the result plotted on the appropriate chart. Provided the result falls into the area marked "transcutaneous bilirubin in this area equals no further action" the result should be clearly recorded in the baby’s notes but no blood test is needed. If the transcutaneous level is above the TCB line, then a serum bilirubin sample should be sent and the result acted on appropriately.

When bilirubin result is within 50micromol/litre of the treatment threshold repeat measurement within 24 hours.

 If during continuing care there is more concern about bilirubin, repeat assessment will be needed. Clearly if babies remain visibly jaundiced to 14 days investigation as per the prolonged jaundice pathway will be required.

Babies with visible jaundice in the Neonatal Unit and community should have serum bilirubin measurements obtained and plotted on the appropriate gestation specific chart. Babies in the community needing phototherapy should be referred to Children Clinical Decision Unit 01274 382311. After being seen the paediatric team will decide if they are essentially well babies needing phototherapy when admission to transitional care may well be appropriate if bed available. Some of these babies may be unwell with other conditions e.g. sepsis requiring acute paediatric care so admission direct to transitional care not appropriate. See separate guideline which covers potential community ACE team care.

38/40 and above, 37, 36 and 35 week charts with TCB guide attached at end of guideline for reference

**Phototherapy NICE guidance section 7.1**

When the bilirubin value is rising rapidly (more than 8.5 micromols/litre/hour) or the bilirubin value is within 50 micromols of the threshold for exchange transfusion, the baby needs to be admitted to neonatal care for double surface intensive phototherapy treatment.

For other babies single surface phototherapy is appropriate. Phototherapy is most effective when the maximum area of skin is exposed. Babies should be nursed in a supine position. Eye protection is required. Baby’s temperature will need to be monitored at least 6 hourly and the observation recorded. It will be important to support feeding and hydration should be assessed both by monitoring the number of wet nappies and by daily weighing.

**Babies admitted for maximal intensity phototherapy NICE guidance section 7.2.1**

Double surface phototherapy is best delivered with a bilisoft below and an LED overhead phototherapy unit set on full power. When needed, effectiveness of phototherapy is increased by reducing the distance between the baby and the overhead phototherapy unit. This can be achieved in a cot by setting the basinet on its highest setting and using 2 mattresses while lowering the overhead LED phototherapy unit to its lowest position. When there is a high level of concern nurse the baby on a platform with the heater turned off and the LED phototherapy unit directly above the baby. This is closer than the manufacturer’s standard guidance but is safe and often prevents need for the much riskier exchange transfusion. It does **not** increase the intensity of phototherapy to use 2 overhead phototherapy units as they have to be further away from the infant. During intensive phototherapy baby’s temperature should be monitored continuously as both hypo and hyperthermia can occur. This is most easily managed using either the temperature probe from the platform or for babies in a cot using a temperature probe and the multi parameter monitors. If baby is cold, a rolled towel as a barrier can be enough to keep them warm – don’t turn the overhead heater on! As baby will not be easy to observe they should be fully monitored including saturations.



Do not remove the baby from intensive phototherapy for feeds / cares but give appropriate enteral feeds or intravenous fluids – it is important to give lactation support and use expressed breast milk if available when enteral feeding possible. Treat or avoid dehydration but over hydrating with IV fluids does not increase bilirubin elimination and should be avoided. Once bilirubin level known to be moving away from exchange threshold care can be normalised e.g. baby brought out from phototherapy for breast feeds etc.

**Blood tests after starting phototherapy NICE guidance section 7.2.3**

Serum bilirubin should be measured 6 hours after initiating phototherapy.

All babies needing phototherapy should have a full blood count and group and Coombs test performed. For many babies this could conveniently be done with the 2nd bilirubin measurement.

Other tests and interventions will clearly be needed if clinical assessment suggests sepsis. Checking glucose 6 phosphate dehydrogenase will be needed for some babies taking into account ethnic origin. Increased risk in families of Mediterranean, African, Middle Eastern and some of Asian origin.

Serum bilirubin should be checked again after approximately 12 hours when the serum bilirubin is stable or falling.

Phototherapy should be stopped when the serum bilirubin level is at least 50 micromols/litre below the phototherapy threshold.

A check bilirubin off phototherapy will be needed 12-18 hours after stopping.

**Intravenous immunoglobulin NICE guidance section 7.4**

Use intravenous immunoglobulin (500 mgs/kg over 4 hours – but follow manufacturers guidance on exact timing of administration) as an adjunct to continuous multiple phototherapy in cases of rhesus haemolytic disease or ABO haemolytic disease when bilirubin continues to rise by more than 8.5 micromols/litre/hour. Decision to use intravenous immunoglobulin will be taken at senior level. Although prior approval is not needed for the use of immunoglobulin in haemolytic disease of the newborn, an appropriate immunoglobulin recording sheet must be completed for each patient. Parents will need to be informed but formal written consent is not needed.

**Exchange transfusion NICE guidance section 8**

Exchange transfusion is indicated when the serum bilirubin level is in the exchange zone on the chart and not rapidly improving with phototherapy and for all babies with clinical features of bilirubin encephalopathy. Low haemoglobin at birth a marker of possible need for exchange transfusion regardless of bilirubin. Take urgent senior advice on potential need to prepare for exchange while very closely monitoring bilirubin level. Predicting trend in bilirubin level and potential need for exchange can be difficult – especially during early course when response to phototherapy and immunoglobulin not yet clear. Do not stop intensive phototherapy pending and after exchange transfusion until the bilirubin level is known to be safe. Continue phototherapy during exchange transfusion – overhead phototherapy may need to be switched off to allow access. Bilisoft phototherapy plus if possible the ‘white’ platform phototherapy should be continued throughout.

See guidelines: Exchange transfusion

 Exchange Transfusion checklist

 Exchange transfusion Powerpoint guide

**Follow up**

Babies with significant haemolysis (where immunoglobulin given, exchange considered or carried out) will need folic acid until seen in clinic and should have approx. 500micrograms / kg/ day (that’s 1ml / kg of standard liquid form)

Timing of clinic review and follow up blood tests to be confirmed on consultant ward round but many babies will need FBC at 2 week – this can be arranged by sending haematology form to the children’s phlebotomists in POPD at St Lukes.

**Prolonged jaundice NICE guidance section 6.2**

 **Background**

By definition this is when jaundice persists in babies with a gestational age of 37 weeks for more for 14 days and in preterm babies more than 21 days. Although many of these babies will have innocent ‘breast milk’ jaundice they all need further assessment to rule out other very important causes.

Important pointers can be pale chalky stools and /or dark urine that stains the nappy but all babies with prolonged jaundice need further tests. Unwell babies need urgent paediatric assessment.

 **Prolonged Jaundice Pathway**

Check total and conjugated bilirubin – at least 0.5mls in gel separator bottle requested on biochemistry form. Make sure result chased the same day.

All unwell babies or any baby with conjugated bilirubin level **>25micromols** or total bilirubin **>350micromols** need urgent paediatric assessment – ring Children’s Clinical Decision Area on 01274 382311 to arrange admission today.

Breast fed babies who are well with total bilirubin **<250** and conjugated bilirubin **<25** do **NOT** need to be seen. Unless other concerns they can be passed on the health visitors.

Babies with prolonged jaundice - total bilirubin **250-350** and conjugated bilirubin **<25** - need further assessment but this is less urgent. This can usually be done by the neonatal outreach team.

* + Ring the neonatal secretaries on 01274 364524 / 382020 / 382668 to make a referral. Demographic details for baby and mum, a contact telephone number for the family and the hospital number and where the baby was discharged home from will be needed. It is helpful to know when the ‘Guthrie’ test was done.
	+ Once the referral has been approved by the neonatal consultant an arrangement for the outreach team to visit will be made, and the family contacted by phone.
	+ At the review the outreach team will take a full history and examine baby. During the visit all babies will need to have a urine sample collected.
	+ Some babies may need further follow up – this will be discussed with the family following assessment and review of results.. Following review a letter will be sent to baby’s GP.

For detailed advice on process of prolonged jaundice review and parents info see please see separate documents.





