Children's Liver Disease Foundation

fighting childhood liver disease

Jaundice Protocol

Early identification and referral of liver disease in infants

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Registered charity number 1067331 (England & Wales); SC044387 (Scotland)

The following organisations endorse the Yellow Alert Campaign and are listed in alphabetical order.

British Association for Community Child Health

British Association of Perinatal Medicine Founded 1976

BSPGHAN working for children with digestive and liver disorders
British Society of Paediatric Gastroenterology Hepatology and Nutrition

CPHVA

RCGP Royal College of General Practitioners

Royal College of Nursing

1 INTRODUCTION

This protocol forms part of Children's Liver Disease Foundation's (CLDF) Yellow Alert Campaign and is written to provide general guidelines on the early identification of liver disease in infants and their referral, where appropriate.

Materials available in CLDF's Yellow Alert Campaign

CLDF provides the following materials as part of this campaign:

- **Yellow Alert Jaundice Protocol** for community healthcare professionals
- **Yellow Alert stool colour book mark** for quick and easy reference
- **Parents' leaflet entitled "Jaundice in the new born baby".** CLDF can provide multiple copies to accompany an antenatal programme or for display in clinics
- **Yellow Alert poster** highlighting the Yellow Alert message and also showing the stool chart

2 GENERAL AWARENESS AND TRAINING

The National Institute of Health and Clinical Excellence (NICE) has published a clinical guideline on neonatal jaundice which provides guidance on the recognition, assessment and treatment of neonatal jaundice in babies from birth to 28 days.

Neonatal Jaundice Clinical Guideline guidance.nice.org.uk cg98

For more information go to **nice.org.uk/cg98**

• Jaundice

Community healthcare professionals should be aware that there are many causes for jaundice in infants and know how to tell them apart:

- Physiological jaundice
- Breast milk jaundice
- Jaundice caused by liver disease
- Jaundice from other causes, e.g. haemolysis
- Jaundice caused by infection
- Jaundice caused by hypothyroidism

Prolonged jaundice is defined as jaundice persisting beyond two weeks of age in term babies and three weeks in pre-term babies.

• Urine and stool colour

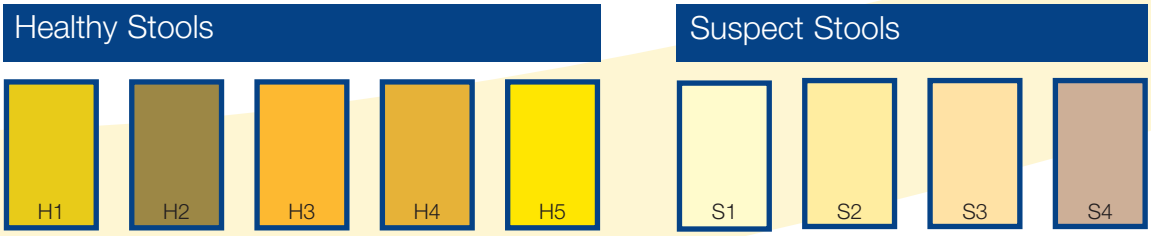
Community professionals should be aware of the importance of urine and stool colour:

- Normally a baby's urine is colourless
- Persistently yellow urine which stains the nappy can be a sign of liver disease
- Normally a baby's stools are green or yellow
- Persistently pale coloured stools may indicate liver disease

Note:

A jaundiced baby with pale stools and yellow urine can appear completely healthy. The baby may have a potentially fatal liver disease.

The interpretation of stool colour can be subjective. The colour chart given below will help to overcome this problem.



Digital printing or photocopying of this stool chart will alter them. Use only items supplied by CLDF.

A healthy baby's stools can be any of these colours. Do not worry about green stools. Breast-fed babies often pass watery stools. A sudden change to frequent watery stools of any colour may mean the baby is unwell.

In babies with liver disease the stools may be one of these colours. Do not worry about one or two that look unusual.

All infants with pale stools and yellow urine should be referred appropriately for investigation (see later).

All babies with prolonged jaundice should have a split bilirubin test carried out (see later).

3 THE ANTENATAL PERIOD

CLDF experience is that when baby jaundice is explained in the antenatal period, parents are less anxious if their baby becomes jaundiced. In addition, they are knowledgeable about the course of action to be taken in the event of prolonged jaundice, i.e. beyond two weeks of age in a term infant. Children's Liver Disease Foundation produces a leaflet entitled "Jaundice in the newborn baby" which is designed for parents. It explains ordinary baby/physiological jaundice and the action which should be taken in the event of prolonged jaundice.

4 FIRST VISIT OF MIDWIFE AND/OR HEALTH VISITOR

- Every baby should be checked for jaundice by looking at the sclera of the eyes.
- The presence of jaundice in an infant should always be recorded when transferring a baby from the midwife to the health visitor.
- On transferring a baby from the midwife to health visitor the record should state that a jaundice check has been carried out.
- If the baby is jaundiced, however mild, stools and urine should be checked and seen by either the health visitor and/or midwife.
- A baby's urine should be colourless.
  If yellow, this should be investigated, see section 5 below.
- Stools should be pigmented yellow or green. See stool chart above.
  If pale or clay-coloured this should be investigated, see section 5 below.

Note:

If the stools and urine in a jaundiced baby are abnormal in colour, the baby should be referred to a paediatrician immediately.

5 PROLONGED JAUNDICE

Definition of prolonged jaundice:

Jaundice which persists in the sclera of the eyes two weeks after birth in term babies and three weeks after birth in a pre-term baby, whether or not the baby has pale stools.

Action in the event of prolonged jaundice

- If the baby is unwell and/or not progressing normally then the infant should be referred to a paediatrician for investigation.

- **Carry out general assessment**

  - Feeding history including whether breast or bottle-fed
  - Weight
  - Document stool and urine colour
  - Inform parents of reason for blood tests

- **Request the following blood tests:**

  - Serum bilirubin blood test
    This test measures the total bilirubin in the blood.

  - Split bilirubin blood test
    This test measures the conjugated (direct) bilirubin level and the unconjugated (indirect) bilirubin levels.

    It is recommended that all babies with prolonged jaundice be given a split bilirubin test.

    In breast-fed babies it is vital that a split bilirubin test is carried out so that the conjugated and unconjugated levels are known because breast milk jaundice is **unconjugated hyperbilirubinaemia**.

Causes of unconjugated hyperbilirubinaemia are:

- Prolonged physiological jaundice
- Breast milk jaundice
- Crigler Najjar Syndrome
- Haemolysis (red cell breakdown)

If the conjugated bilirubin is greater than 20% of the total bilirubin or greater than 25 micromoles/litre, the baby should be referred for immediate investigation by a paediatrician.

If the conjugated bilirubin is less than 20% of the total and the total bilirubin is less than 200 micromoles/litre, the parent(s)/guardian(s) should be reassured and weekly serum bilirubin levels checked until it returns to normal.

Where the total bilirubin is high (greater than 200 micromoles/litre) and the conjugated fraction is less than 20%, healthcare professionals are advised to contact a paediatrician and refer also to NICE neonatal jaundice clinical guideline (CG98) and any local guidelines.

6 INVESTIGATION

See algorithm on back page.

The following should be referred to a paediatrician:

- A baby who is unwell and/or not progressing normally.
- A baby with abnormal colour of stools and/or urine at any age.
- A baby where the conjugated bilirubin is greater than 20% (25 micromoles/litre) of the total bilirubin.
- Any infant with prolonged jaundice that has not been investigated.

Breast-fed babies may also have liver disease; be extra careful to check stools and urine colour.

The tests should include:

- **Repeat Split Bilirubin Test**
- **Liver Function Tests**

  These include the following:

  - Albumin
  - Aspartate and Alanine Transaminases (AST, ALT)
  - Alkaline Phosphatase (ALP)
  - Gamma Glutamyltransferase (GGT)

- **Coagulation Tests**

  - Prothrombin Time (PT)
  - Partial Thrombin Time (PPT)

  Coagulation may be prolonged secondary to vitamin K deficiency, particularly in breast-fed babies not given vitamin K at birth. All babies with suspected liver disease must be given vitamin K orally if the INR is normal or intravenous/intra-muscular is abnormal.

- **Blood glucose**

Note:

If any of the investigative tests are abnormal or liver disease is suspected, the infant may need referral to a specialist unit for further investigations or management. This may be at a regional paediatric gastroenterology unit with an interest in paediatric hepatology or supra-regional paediatric liver unit. (see contact details below).

There are three specialist paediatric liver centres in England, all offer medical and surgical management including transplantation.

The Department of Health has designated the three specialist paediatric liver centres to carry out kasai-portoenterostomy for biliary atresia in England.

7 ADVICE

The British Society for paediatric Gastroenterology, Hepatology and Nutrition (BSPGHAN) has further advice for paediatricians on tests:

www.bspghan.org.uk/document/liver/InvestigationofNeonatalConjugatedhyperbilirubinaemia.pdf

The supra-regional paediatric liver units are happy to provide advice:

- ***Paediatric Liver, GI and Nutrition Centre***
  Kings College Hospital, Denmark Hill, London SE5 9RS
  Tel: 020 3299 3214. For up to date contact information go to www.kch.nhs.uk

- ***The Liver Unit***
  Birmingham Children's Hospital, Steelhouse Lane, Birmingham B4 6NH
  Tel: 0121 333 9999 and ask to liaise with the on-call liver registrar.
  Alternatively, (office hours) contact secretarial team on 0121 333 8250.
  For up to date contact information go to www.bch.nhs.uk

- ***Children's Liver and GI Unit***
  Leeds General Infirmary, Great George Street, Leeds, West Yorkshire LS1 3EX
  Tel: 0113 392 7112.
  For up to date contact information go to www.leedsteachinghospitals.com

8 INFORMATION FOR PARENTS OF INFANTS WITH CONJUGATED HYPERBILIRUBINAEMIA

Children's Liver Disease Foundation has a leaflet for parents explaining conjugated hyperbilirubinaemia and the further investigations which may be needed. It is very helpful for parents awaiting referral to a specialist.

Parents are able to download "Baby Jaundice and Liver Disease" from CLDF's website — childliverdisease.org

9 FURTHER INFORMATION

Further information and requests for copies of Yellow Alert Campaign literature can be obtained from:

Children's Liver Disease Foundation
36 Great Charles Street
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Tel: 0121 212 3839
info@childliverdisease.org
yellowalert.org
childliverdisease.org

There may be a charge for materials. Prices available on request.

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9 EARLY IDENTIFICATION ALGORITHM

Jaundiced Baby
Term: > 2 Weeks
Pre-Term: > 3 Weeks

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Carry out General Assessment
- Feeding History
- Baby's Weight
- Document Stool and Urine Colour

Baby Well

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Inform Parents of reason for blood test
- Split Bilirubin Test

Conjugated Bilirubin
> 20% (25 micromoles/l) of Total Bilirubin

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Refer to Paediatrician for:
- Repeat Split Bilirubin
- Liver Function Tests
- Blood Glucose
- Coagulation

Conjugated Bilirubin
< 20% (25 micromoles/l) of Total Bilirubin and Total Bilirubin < 200 micromoles/l

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Reassure and review serum bilirubin weekly until returns to normal

Baby Unwell

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Refer to Paediatrician

Conjugated Bilirubin
< 20% (25 micromoles/l) of Total Bilirubin and Total Bilirubin > 200 micromoles/l

↓

Refer to Paediatrician

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