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Caring for young lives

Children's Liver Disease Foundation

Jaundice Protocol

Yellow Alert

Early identification and referral of liver disease in infants

Caring for young lives

Children's Liver Disease Foundation

36 Great Charles Street
Birmingham B3 3JY

Telephone: 0121 212 3839
Facsimile: 0121 212 4300

Website: www.childliverdisease.org
Email: info@childliverdisease.org

Registered Charity No. 1067331

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

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

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1 INTRODUCTION

This protocol forms part of the 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. It aims to be of value to the community team.

Materials available in the Yellow Alert Campaign

CLDF provides the following materials as part of this campaign:

- **Yellow Alert Campaign Jaundice Protocol** for community healthcare professionals
- **Stool Chart 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 Campaign poster** highlighting the Yellow Alert message and also showing the stool chart

The Children's Liver Disease Foundation also runs four study days per year specifically for community healthcare professionals which are based at the three paediatric supra-regional centres: King's College Hospital, London; Birmingham Children's Hospital; St James's University Hospital, Leeds. The one-day course gives an overview on paediatric liver disease. Details are also available on the CLDF website www.childliverdisease.org

2 GENERAL AWARENESS AND TRAINING

• 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 healthcare 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 lethal liver disease.

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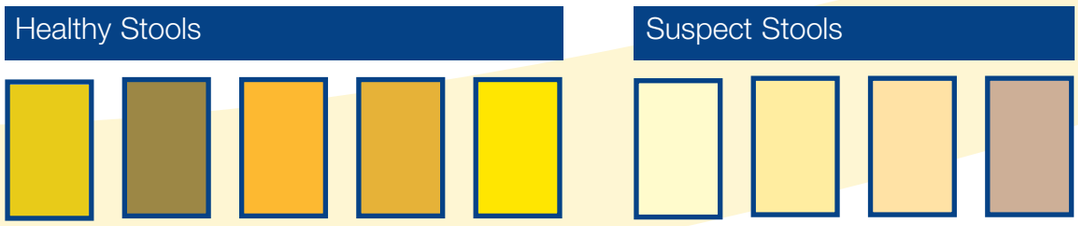
The interpretation of stool colour can be subjective. The colour chart given below will help to overcome this problem.



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 also explains ordinary baby/physiological 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.

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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, 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/l, the parent(s)/guardian(s) should be reassured and weekly serum bilirubin levels checked until it returns to normal.

Where the total bilirubin is very high (greater than 200 micromoles/l) and the conjugated fraction is less than 20%, healthcare professionals are advised to contact a paediatrician. There may be regional/local variations for the upper limit of the total bilirubin in which advice should be sought.

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% 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.

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 if 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 diagnosis or management. This may be a regional gastroenterology unit or a supra-regional liver unit, as appropriate.

The British Society of Paediatric Gastroenterology, Hepatology and Nutrition (BSPGHAN) has further advice for paediatricians on tests on www.bspghan.org.uk

There are 3 supra-regional units for the treatment of children with liver disease. GPs or Paediatricians can make referrals directly to the unit and are welcome to seek advice. These are:

Paediatric Liver Service, King's College Hospital, London
The Liver Unit, Birmingham Children's Hospital
Children's Liver and GI Unit, St James's University Hospital, Leeds

Please note the Department of Health has designated these three centres in England to perform Kasai-portoenterostomy for biliary atresia.

7 ADVICE

The three paediatric supra-regional units are happy to provide advice, as necessary:

The Liver Unit
Birmingham Children's Hospital
NHS Trust
Steelhouse Lane
Birmingham
B4 6NH
Tel: 0121 333 8256
Fax: 0121 333 8251

Children's Liver and GI Unit
Ward 11, Gledhow Wing
St James's University Hospital
Beckett Street
Leeds
LS9 7TF
Tel: 0113 206 6880
Fax: 0113 206 6691

Paediatric Liver Service
King's College Hospital
Denmark Hill
London
SE5 9RS
Tel: 020 3299 3214
Fax: 020 3299 4228

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8 FURTHER INFORMATION

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

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B3 3JY
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info@childliverdisease.org
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CLDF is grateful for grants from the following and other generous donors towards this project:

- Austin & Hope Pilkington Trust
- Edgar E Lawley Charitable Trust
- HSA Charitable Trust
- Heart of England Radio Charitable Trust
- Rowlands Trust
- Sylvia Aitken Charitable Trust
- Willie & Mabel Morris Charitable Trust

This leaflet is for information purposes only. Of necessity it has been prepared for general application. In each individual case professional medical or other advice should be obtained before acting on anything contained herein as no responsibility can be accepted by the Children's Liver Disease Foundation.

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Yellow Alert

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

↓

Inform Parents of reason for blood test
- Split Bilirubin Test

↓

Conjugated Bilirubin
> 20% of Total Bilirubin

↓

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

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

↓

Reassure and review serum bilirubin weekly until returns to normal

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

↓

Refer to Paediatrician

Baby Unwell

↓

Refer to Paediatrician

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