

WEBINAR – Education resource for the detection of jaundice in newborns in the community

Friday 5th June 2020

NHS England and NHS Improvement



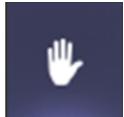
Welcome to the South East Perinatal Safety Group Webinar on the detection of jaundice in newborns

We'll be starting shortly.

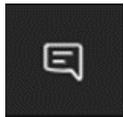
Housekeeping



Please go on mute and turn cameras off until the Q&A session at the end of the webinar.



Raise your hand during the Q&A session to let us know you want to ask a question.



Questions can also be submitted via the chat box, which we will respond to after the webinar.



This webinar will be recorded and shared afterwards to those unable to attend

Data, prevalence and national recommendations

Dr Aung Soe

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Foundation Trust

Clinical Lead (Joint), South East Neonatal Network
Clinical Co-chair, Kent & Medway Local Maternity System

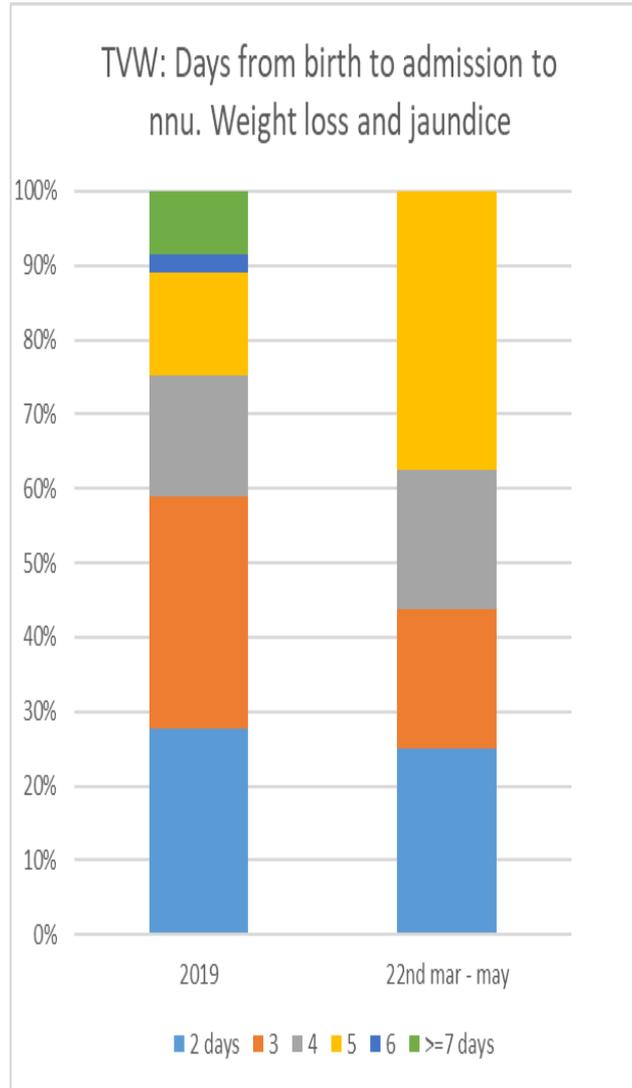
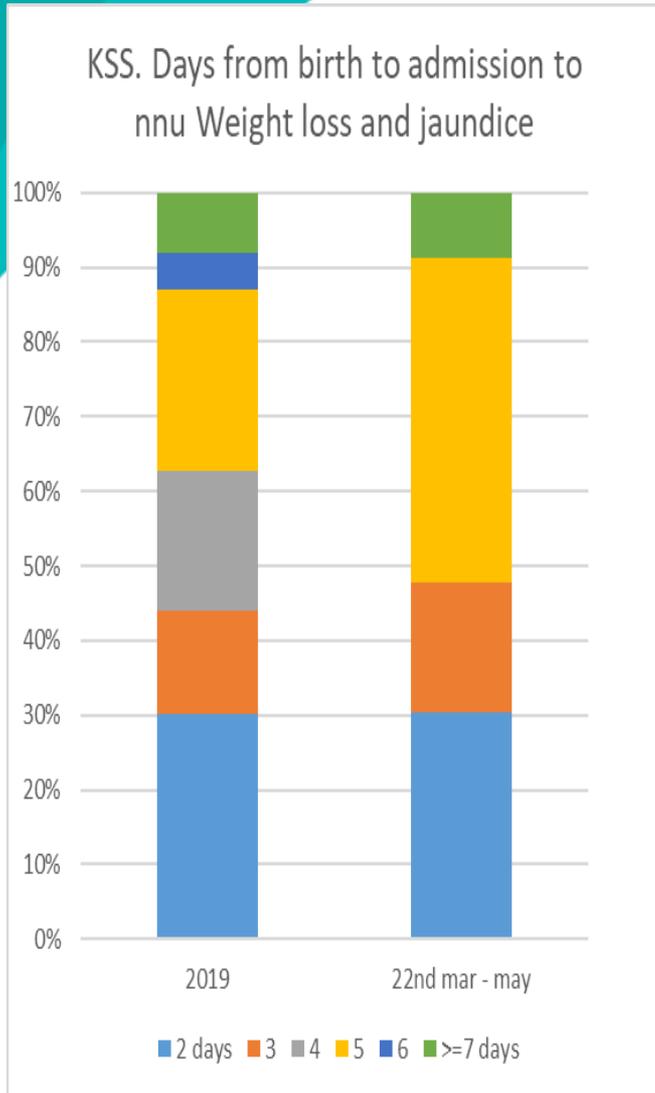
Outline

- Prevalence – babies returning from the community & changes seen during COVID in SE
- NICE Guideline 2016
- Maternity Transformation Programme Bulletin No.22 : 29th May 2020

Admissions of babies ≥ 48 hours with jaundice or weight loss to NNU or TC



Age at admission for babies ≥ 48 hours with jaundice or weight loss to NNU



This indicates might be a delay in readmission for weight loss or jaundice

In KSS: 2019 62% of readmissions within 4 days of birth, post covid, 48%.

In TVW: 2019 75% of readmissions within 4 days of birth, post covid, 62%.

Neonatal jaundice

Implementing NICE guidance

2010 & 2016

NICE clinical guideline 98



Key priorities for implementation

- Information for parents and carers
- Care for all babies
- Additional care for babies at risk
- How to measure bilirubin in all babies with jaundice
- How to manage hyperbilirubinaemia
- Care of babies with prolonged jaundice

Care for all babies

- Examine all babies for jaundice at every opportunity especially in the first 72 hours.
- Identify babies as being more likely to develop significant hyperbilirubinaemia if they have any of the following factors:
 1. gestational age under 38 weeks
 2. a previous sibling with neonatal jaundice requiring phototherapy
 3. mother's intention to breastfeed exclusively
 4. visible jaundice in the first 24 hours of life.

Additional care for babies at risk

- Ensure babies with factors associated with an increased likelihood of developing significant hyperbilirubinaemia:
 1. receive an additional visual examination by a healthcare professional during the first 48 hours of life

Better Births: Personal and Safe

Safety – Focus on jaundice

Neonatal jaundice and hyperbilirubinaemia

- Neonatal jaundice, caused by the build-up of bilirubin in the blood, is a common condition which is usually harmless, requires no treatment or responds to phototherapy. On rare occasions it can cause brain damage as a result of excess bilirubin leading to kernicterus.
- The MTP are aware of an increase in babies being readmitted with hyperbilirubinemia.
- NICE guidance states that babies are more likely to develop significant hyperbilirubinaemia if they have any of the following factors:
 - gestational age under 38 weeks
 - a previous sibling with neonatal jaundice requiring phototherapy
 - mother's intention to breastfeed exclusively
 - visible jaundice in the first 24 hours of life.
- NHS Resolution reviewed [twenty claims for injury secondary to neonatal jaundice](#) which were notified between 2001 and 2011. Findings from claims included that the most common risk factors were **ethnicity of parents; family medical history; prematurity and gender**.

Key messages

- Never advise women that sunlight will help to treat jaundice – this is a myth and unsafe advice.
- Share [the postnatal leaflet](#) focusing on jaundice and feeding with women before transfer home – these are available in English as well as [11 other languages](#).
- Consider the use of transcutaneous bilirubinometers to aid early identification of rising bilirubinaemia in the community setting, particularly for ‘at risk’ babies.
- Familiarise yourself with [NICE guidance CG98](#), Jaundice in new born babies under 28 days.
- Familiarise yourself with local policies for management of jaundice and neonatal readmissions.
- Review case notes of babies readmitted for jaundice, poor feeding and weight loss to identify contributory factors and whether pathway revisions need to be considered. Take action to implement learning to avoid future related incidents.
- Review the RCOG advice on individualising postnatal care according to the women and newborns needs following the minimum recommended number of contacts: at day 1, day 5 and day 10.

Guidance for clinical review teams

- The questions below are from the Atain resource pack. They have been used to provide clinical insights; they may be useful to support local analysis:
 - Did the baby have risk factors for jaundice?
 - If so was a plan in place for early detection and management of hyperbilirubinaemia?
 - Was the baby re-admitted from the community setting?
 - Could use of transcutaneous bilirubinometers have helped to avoid this admission?
 - Were there delays in admission and management following referral from the community?
 - Did the baby's parents/carers have the necessary information to recognise jaundice, and were they empowered to seek help?
 - Was there a delay between the carers recognising the problem and healthcare professionals responding which contributed to the need for admission?
 - Was NICE guidance followed in the management of jaundice?
 - What was the highest level of intervention in relation to management of hyperbilirubinaemia (observation, phototherapy, exchange transfusion, etc)?
 - Did the level of intervention require separation of mother and baby?
 - Could this baby have received care in a setting which kept mother and baby together?
 - Was there an associated weight loss and history of poor feeding?

Jaundice leaflet

Coronavirus: Illness in newborn babies

After babies are born they have to breathe, suck, feed, wee, poo and stay warm. This leaflet will tell you how to keep your baby safe and healthy. Do not delay seeking help if you have any concerns.

What is Jaundice?

Jaundice is caused by rising levels of a natural chemical in the blood after birth. It causes a yellowing of the skin, whites of the eyes and the gums (see images on right). It can also lead to babies being sleepy and reluctant to feed.

Most babies will not be affected, but a small number require treatment. Most only need monitoring, some require light-treatment, a few require specialist support.

If your baby has signs of jaundice contact your maternity department during the day or night. They will perform a bilirubin test.

Sunshine is not a treatment so please do not place your baby in direct sunlight.

Regular feeding can help, and if you are breastfeeding we encourage you to breastfeed regularly – about every three hours, waking your baby for feeds.

Sometimes jaundice continues after the baby is 14 days old or more. This can be natural particularly in breastfed babies, however if the poo also looks pale or chalky please inform your midwife or health visitor the same day. More information is available here: <https://childliverdisease.org/liver-information/baby-jaundice/>

Picture 1 shows yellowing of the whites of the eyes.



Picture 2 shows yellowing of the skin.

Breathing, colour and movement if your baby has any of the following call 999 immediately:

- Any change in colour (very pale, blue or dusky)
- Difficulty breathing (noisy grunts, rapid breaths, ineffective breathing, frequent pauses or working hard to breathe)
- Regular jerking of the arms and legs like a fit.

If you are concerned about your baby's health contact your midwife, health visitor or GP.

In an emergency dial 999, during the day or night.

Make sure you have a contact number for your midwife or the hospital before you head home.

Coronavirus: Illness in newborn babies



FEEDING

The following shows how many times your baby should feed and have a wet or dirty nappy in a 24 hour period for the first five days of life.

After day 1 young babies will feed often and the pattern and number of feeds will vary from day to day. From day 2 onwards babies normally feed 8-12 times in a 24 hour period. Access the link here for more information on breastfeeding: <https://www.nhs.uk/start4life/baby/breastfeeding/>

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
FEEDS	3-5	8-12	8-12	8-12	8-12
DIRTY NAPPIES	Black, sticky or dark green at least once	Can be like day 1 changing to day 3	At least 2 brown, green or yellow	At least 2 large yellow which may be seedy	At least 2 large yellow and seedy
WET NAPPIES	2-3	2-3	3 or more	3 or more	6 or more

Midwife contact details (write your midwife contact details below):

For any non-emergency concerns, you can also call NHS 111 if you are unable to contact your midwife.

For more information, please visit: www.nhs.uk and search 'illness in a baby'



For more information and advice visit: www.nhs.uk/pregnancy-and-coronavirus

Resources available

- Two [free eLFH Atain modules on jaundice](#) to update yourself on the physiology of jaundice and Term Newborn Babies at Risk of Jaundice. Share these with colleagues.
- Free resources relating to jaundice in the [Atain resource pack](#)
- [Term admissions to neonatal units in England: a role for transitional care? A retrospective cohort study](#)
- [Learning From Claims: Hyperbilirubinaemia and Kernicterus](#)
- [Postnatal leaflet on jaundice](#) – available in English and [11 other languages](#)



Lightening the Load -
the role of Transcutan



Aiming for a
seamless service for tl



Did-you-know-Neonat
al-Jaundice.pdf



Prof.(Dr.)Minesh Khashu

Consultant Neonatologist & Prof. of Perinatal Health

Fellow, RCPCH

Fellow Q, Health Foundation & NHS Improvement

Fellow, RSA

Fellow, ECPD

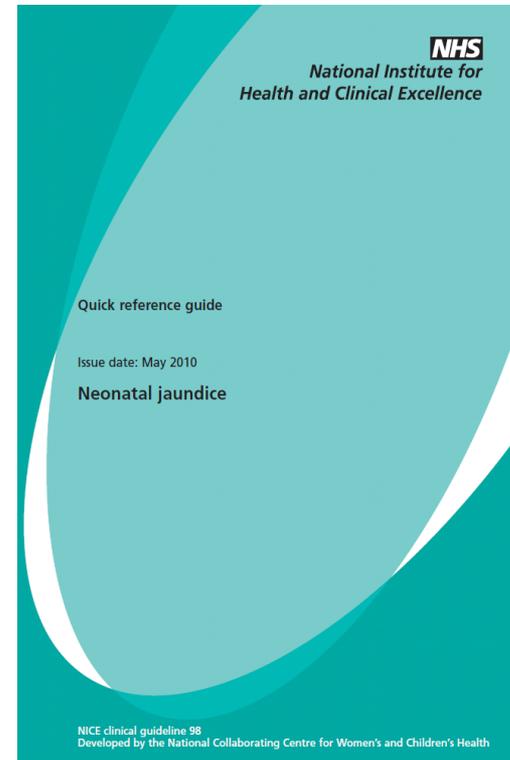
@mkrettiwt

What this presentation covers

Brief overview physiology

Specific risk factors

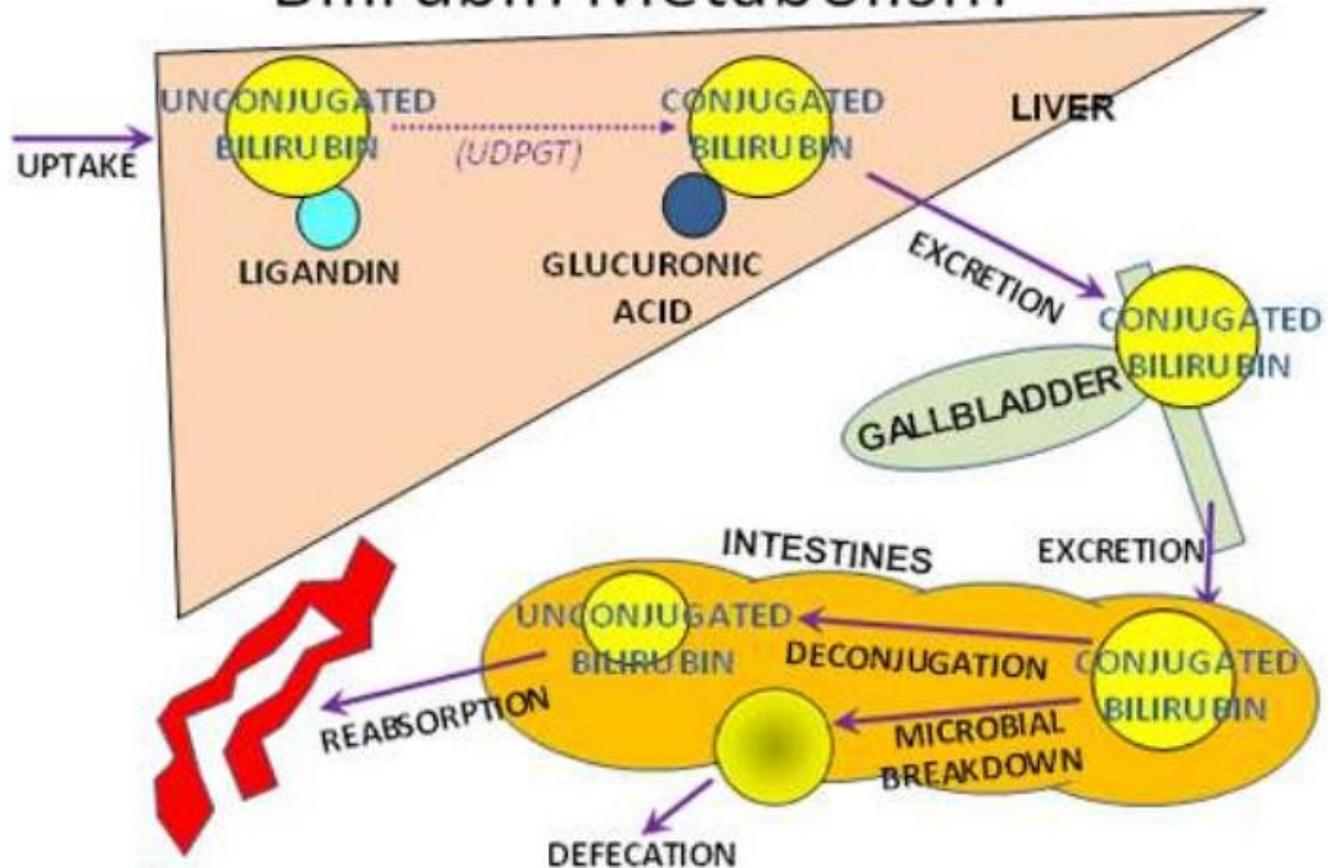
Ethnic minority & dark skin



https://youtu.be/p_GG4OddRRU

Pathophysiology

Bilirubin Metabolism



RES

Heme

Heme oxygenase

Carbon monoxide + Iron

Biliverdin

Biliverdin reductase

Bilirubin

Plasma

Bilirubin - albumin \rightleftharpoons Bilirubin + albumin

Hepatocyte

Ligandin

Glucuronic acid

Glucuronyl transferase

Bilirubin diglucuronide

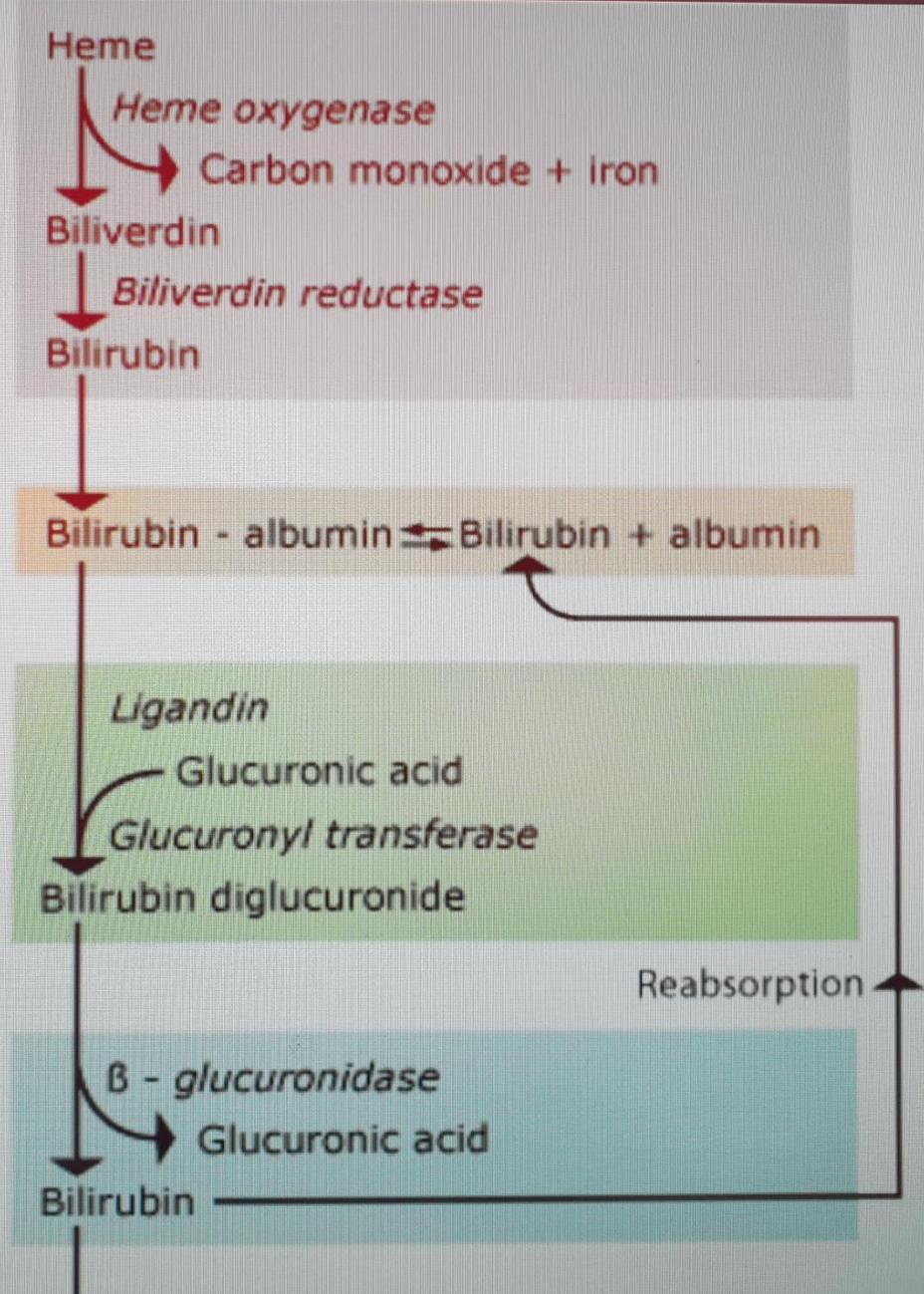
Reabsorption

Gut

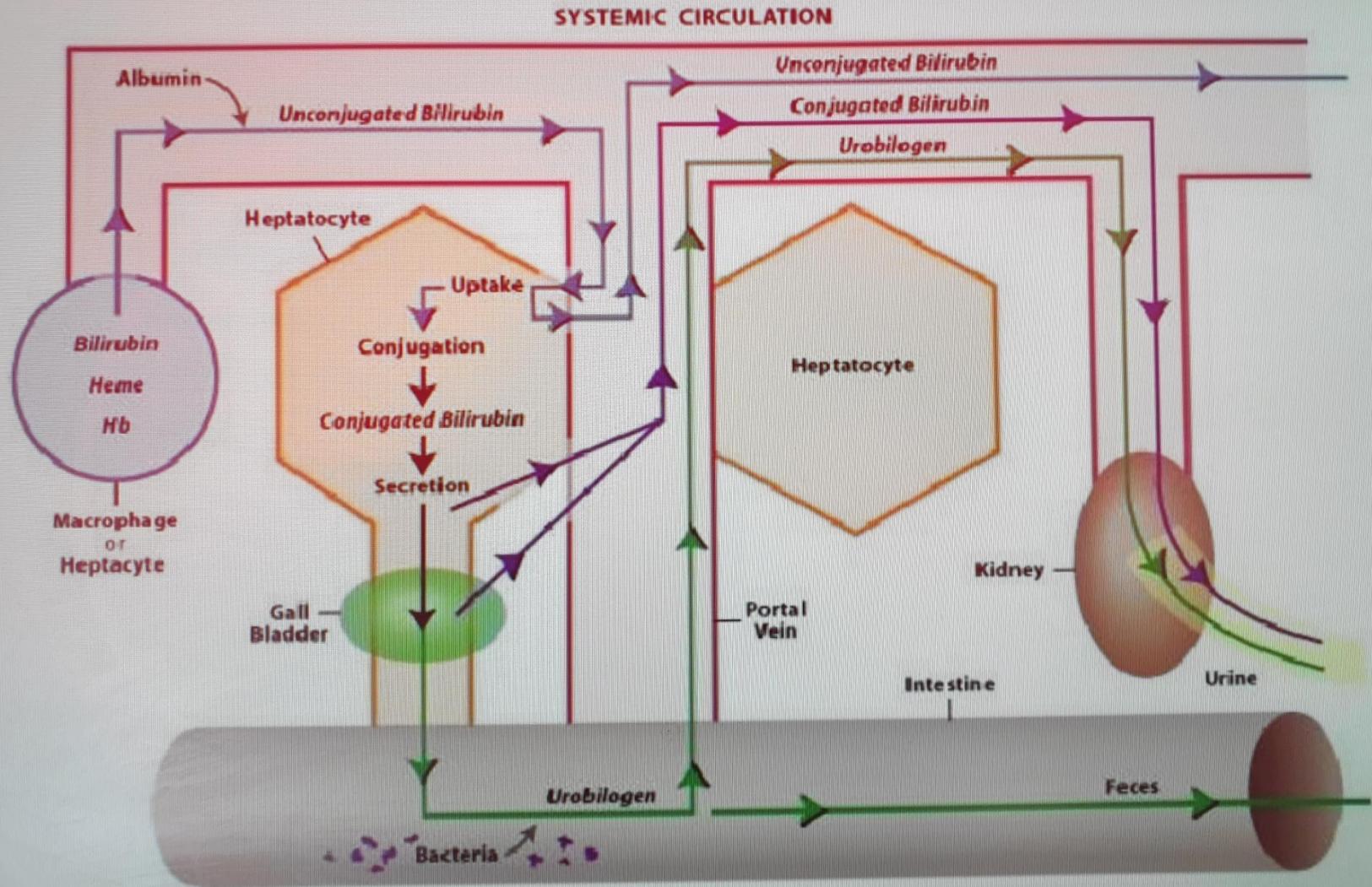
β - *glucuronidase*

Glucuronic acid

Bilirubin



Bilirubin Metabolism



Course of physiological jaundice



Course of physiological jaundice



Risk factors Pneumonic

J : jaundice within 1st 24 hours

A: a sibling requiring treatment for jaundice

U: unrecognised hemolysis

N: non optimal feeding

I : Infection

C: Cephalhematoma/bruising

E: Ethnic background



NHS Resolution database for 2001–2011.

- **20 cases** (16 males)
- 2 extremely preterm, 5 @ 34–36 weeks' gestation.
- **Jaundice was typically present very early in life**; in four cases, it was noted at less than 24 hours of age, and in 14 cases, it was first noted on the second to third day.
- **There was a lag between recognition and readmission**, with a range of 26–102 hours.
- The peak serum bilirubin level was over 600 $\mu\text{mol/L}$ in all the babies born at term.
- **An underlying diagnosis was found in all but two**; six had glucose-6-phosphatase deficiency (one also had Gilbert's syndrome); five were diagnosed with ABO incompatibility; three with Rh haemolytic disease; one with spherocytosis and three preterm.
- The total cost of these claims by August 2017 was almost **£150.5 million**.
- Babies who develop kernicterus generally have an underlying diagnosis.
- We recommend adherence to the National Institute for Health and Care Excellence guideline that **recommends measuring the bilirubin level within 6 hours in all babies who are visibly jaundiced.**



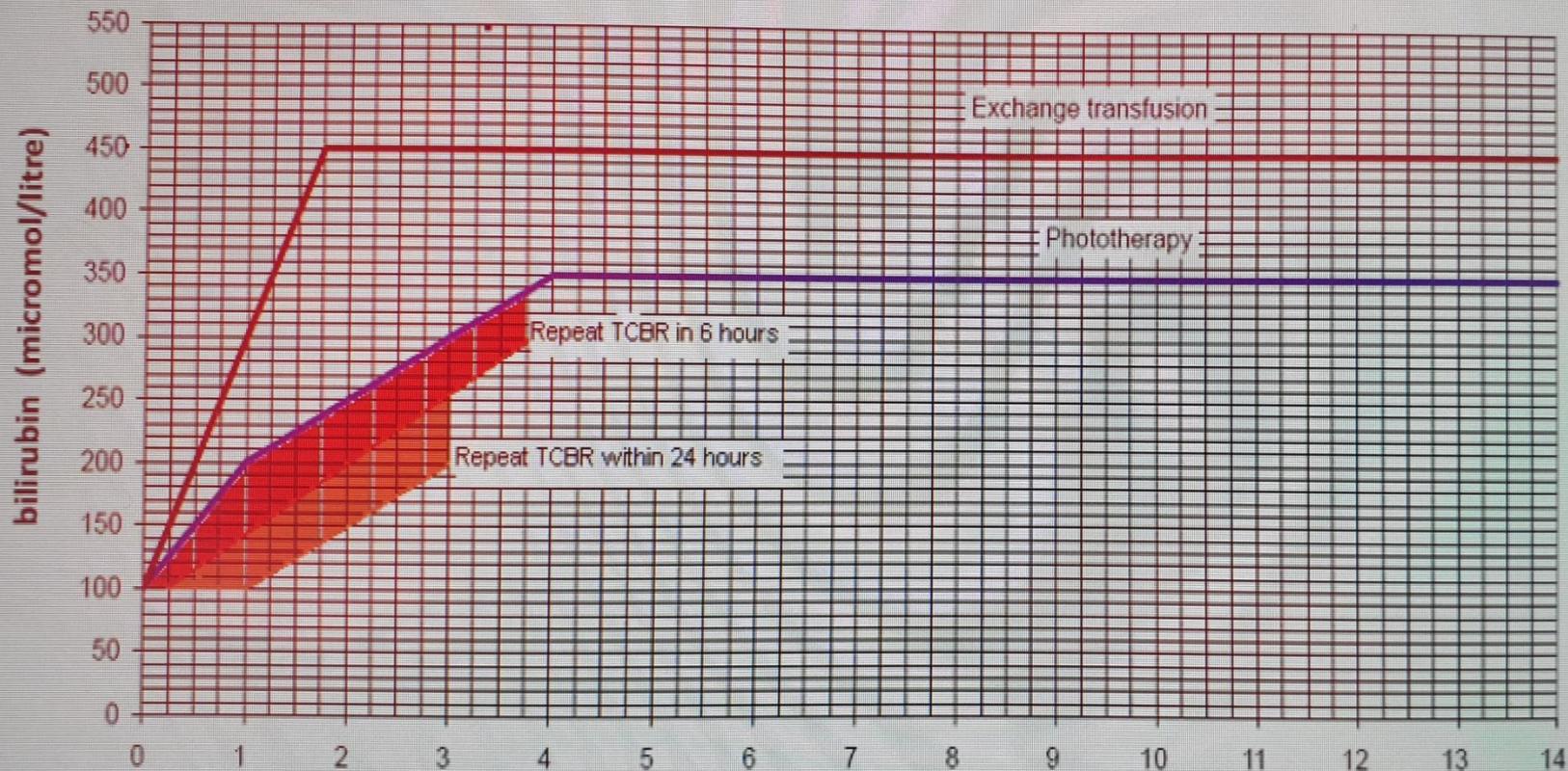
Measuring bilirubin in all babies with jaundice

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



Transcutaneous Bilirubin Measurement (TCBR) in the Community

Gestation: ≥ 38 weeks



If baby's TCBR is in the amber shaded area: repeat TCBR within 24 hours

If baby's TCBR is in the red shaded area: repeat TCBR within 6 hours

If baby's TCBR is above the blue line: refer to paediatrics for phototherapy

Days from birth

Adapted from:



National Institute for
Health and Clinical Excellence

KEY TAKE HOME MESSAGES



Course of physiological jaundice



Measuring bilirubin in all babies with jaundice

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



Risk factors Pneumonic

J : jaundice within 1st 24 hours

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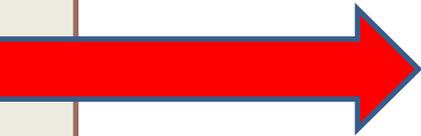




“We are what we repeatedly do. Excellence, therefore, is not an act, but a habit.”
--Aristotle

Is There a Problem?
What *is* the Problem?
What Causes the Problem?
What Keeps you from Solving the Problem?

How do We Feel About This?
Are You Going to be Part of the Problem, or Part of the Solution?



What could you do to make a small improvement?
Who or what do you need for that?

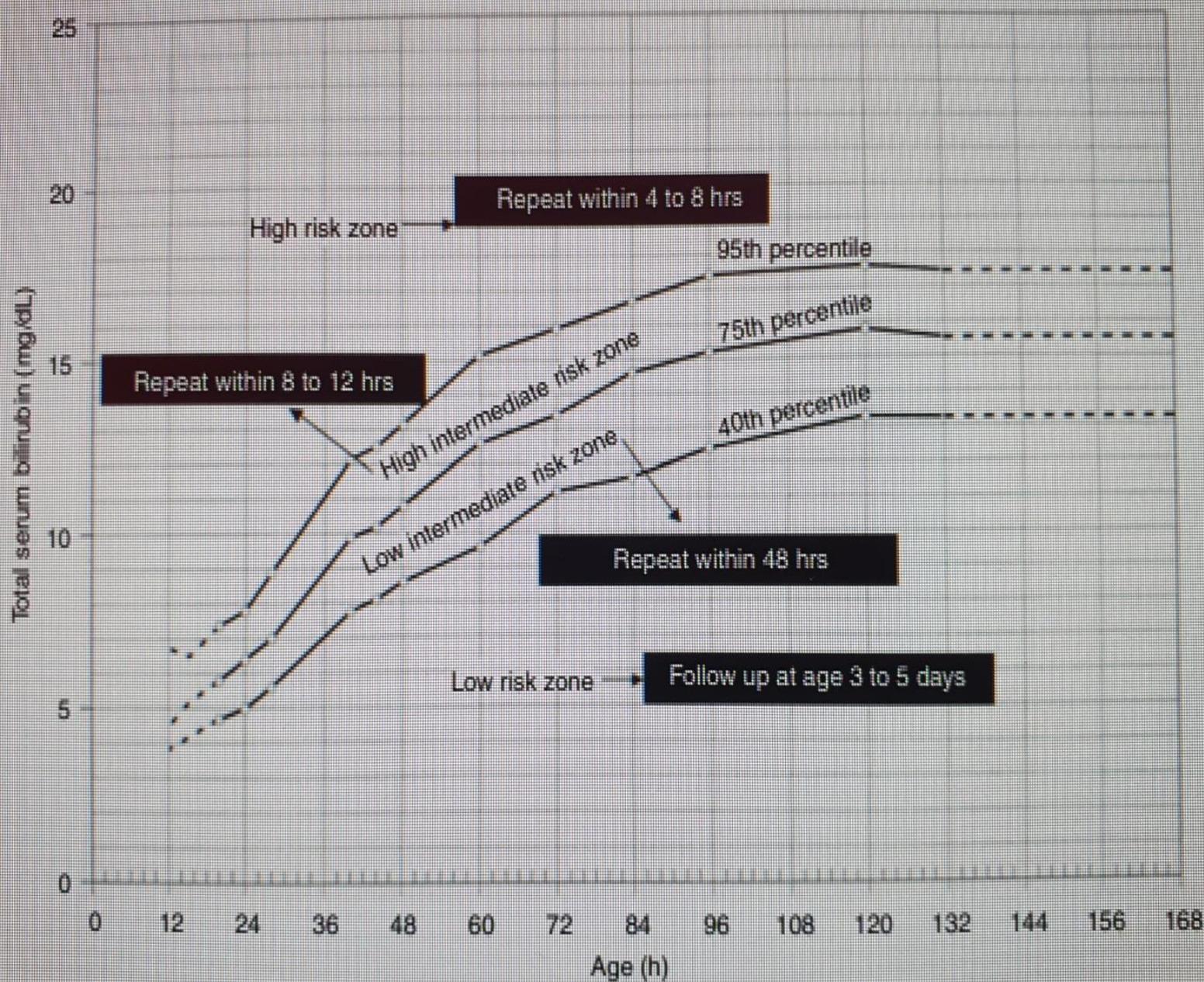


Figure 3 An approach to time follow-up for repeat jaundice and bilirubin evaluation based on pre-discharge bilirubin testing.

Overcoming barriers

- The guideline recommends that **babies at risk of hyperbilirubinaemia be further assessed within 48 hours**. As most healthy term babies are at home by this stage, this requirement for a home visit is also an opportunity to deliver breastfeeding support and other advice.
- **More widespread use of transcutaneous bilirubinometry**, recommended as a first line test in assessing jaundice, has implications for community workers and commissioners or purchasers. A health economic review in the guideline's development showed that investment in these devices would be cost effective if only one or two cases of kernicterus a year were averted by their use.
- Calculation of the bilirubin concentration according to the baby's postnatal age in hours can be difficult to do quickly. A guideline implementation tool ("the biliwheel") designed to help perform this calculation and to determine when to refer babies is currently undergoing validation.
- The use of phototherapy currently varies widely. The guideline's treatment threshold graphs provide guidance on starting phototherapy and on considering exchange transfusion, with advice on when to measure the serum bilirubin concentration and on continuation and cessation of phototherapy.

Medical Interventions

Preventive Strategies

1. Decrease entero-hepatic circulation
 - > Increase enteral milk intake
 - > Promote breast feeding and milk transfer
 - > Supplement enteral intake
2. Phototherapy
3. Chemoprevention
4. Exchange transfusion

Specific Intervention	Aviation Analogy	Expected Incidence
Bilirubin test and lactation support	Use of a safety belt	For all infants
Targeted use of intensive phototherapy (hospital)	Use of emergency procedures	Less than 1 in 50
Prepare for an exchange transfusion	A crash landing	Rare "near-miss" event

Figure 1 Medical and preventive strategies to reduce hyperbilirubinemia.

1 Identification

**Cases of
Kernicterus**

2 Characterization

**National AAP
Guidelines**

3 Optimization

**Educational Tool-
kits (eg: CPQCC)**

**To Achieve Aviation Safety Standards
for Newborn Healthcare**

4 Implementation

**At Offices and
Birthing Hospitals**

5 Outcomes

- Exchange Rate
- Readmit rate

To convert results
from mg/dL to $\mu\text{mol/L}$,
multiply mg/dL by 17.1

6 Compliance

**TSB ≥ 25 mg/dL
or, Sentinel event**

Driver Diagram Template

Primary Drivers

Secondary Drivers

Change Ideas

Priority Change Ideas



The Problem:

XXXX

Primary Driver 1

Process Measure:

- How much:
- By when:

Secondary Driver 1.1

Secondary Driver 1.2

Secondary Driver 1.3

Change Idea 1.1

Change Idea 1.2

Change Idea 1.3

Change Idea 1.4

Impact: High Low
Implementation: Easy Hard

Primary Driver 2

Process Measure:

- How much:
- By when:

Secondary Driver 2.1

Secondary Driver 2.2

Secondary Driver 2.3

Change Idea 2.1

Change Idea 2.2

Change Idea 2.3

Change Idea 2.4

Impact: High Low
Implementation: Easy Hard



SMART Aim:

Primary Driver 3

Process Measure:

- How much:
- By when:

Balancing Measure:

- How much:
- By when:

Process Measure:

- How much:
- By when:

Secondary Driver 3.1

Secondary Driver 3.2

Secondary Driver 3.3

Change Idea 3.1

Change Idea 3.2

Change Idea 3.3

Change Idea 3.4

Impact: High Low
Implementation: Easy Hard

Outcome Measure:

- How much:
- By when:

Primary Driver 4

Process Measure:

- How much:
- By when:

Secondary Driver 4.1

Secondary Driver 4.2

Secondary Driver 4.3

Change Idea 4.1

Change Idea 4.2

Change Idea 4.3

Change Idea 4.4

Impact: High Low
Implementation: Easy Hard



Team Members:

- Project Sponsor/s -
- Team Leader -
- Consumer -
- QI Advisor -
- Xx
- Xx
- xx
- Xx
- xx

NB: Can Hyperlink measures to Graphs in Spread sheets

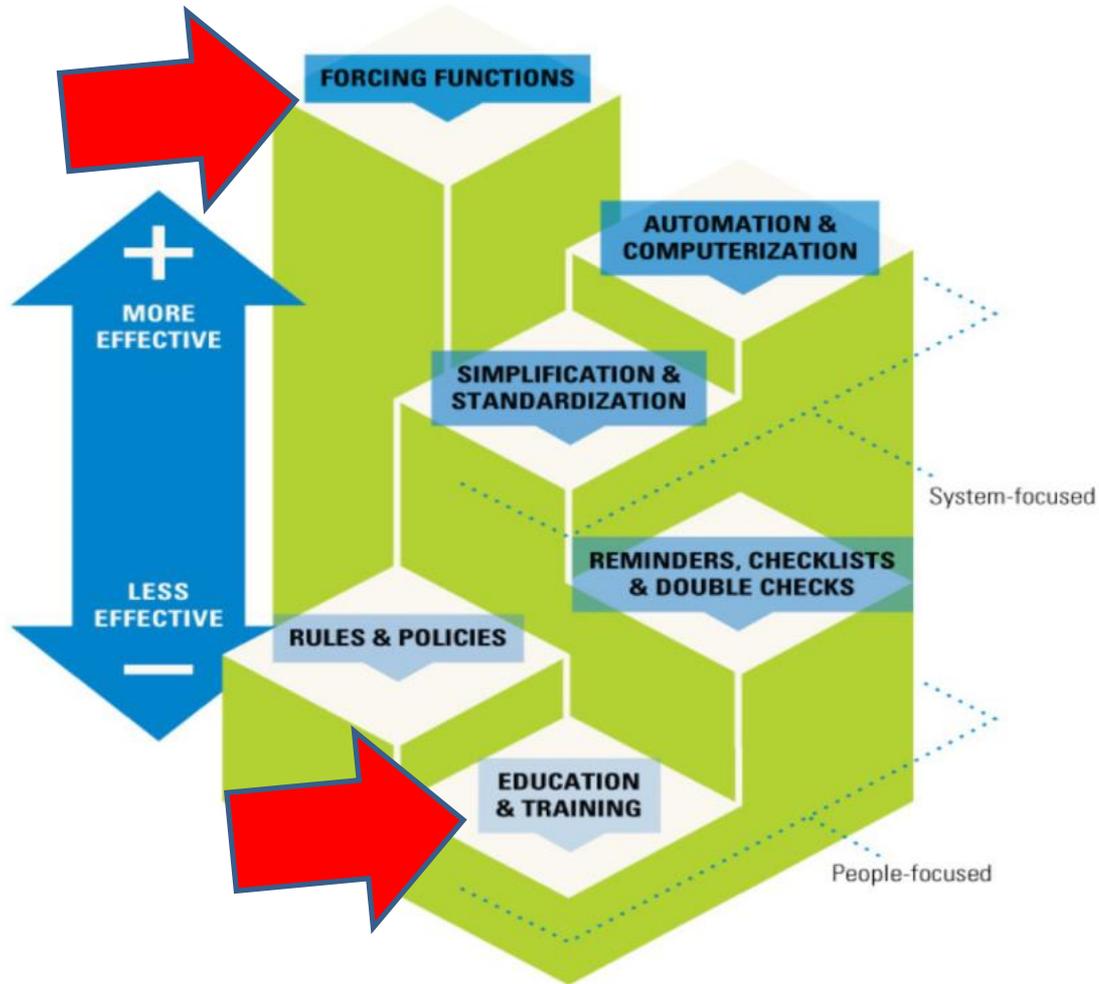
Primary Driver 5

Process Measure:

- [How much:](#)
- [By when:](#)

As you think about interventions in your areas of work...

The Hierarchy of Intervention Effectiveness



Assessment and Referral for Jaundice in the Newborn



Lisa Schoenewolf

Community Midwife Team Leader

Frimley Health NHS Foundation Trust



Colour

Poor Tone

Behaviour

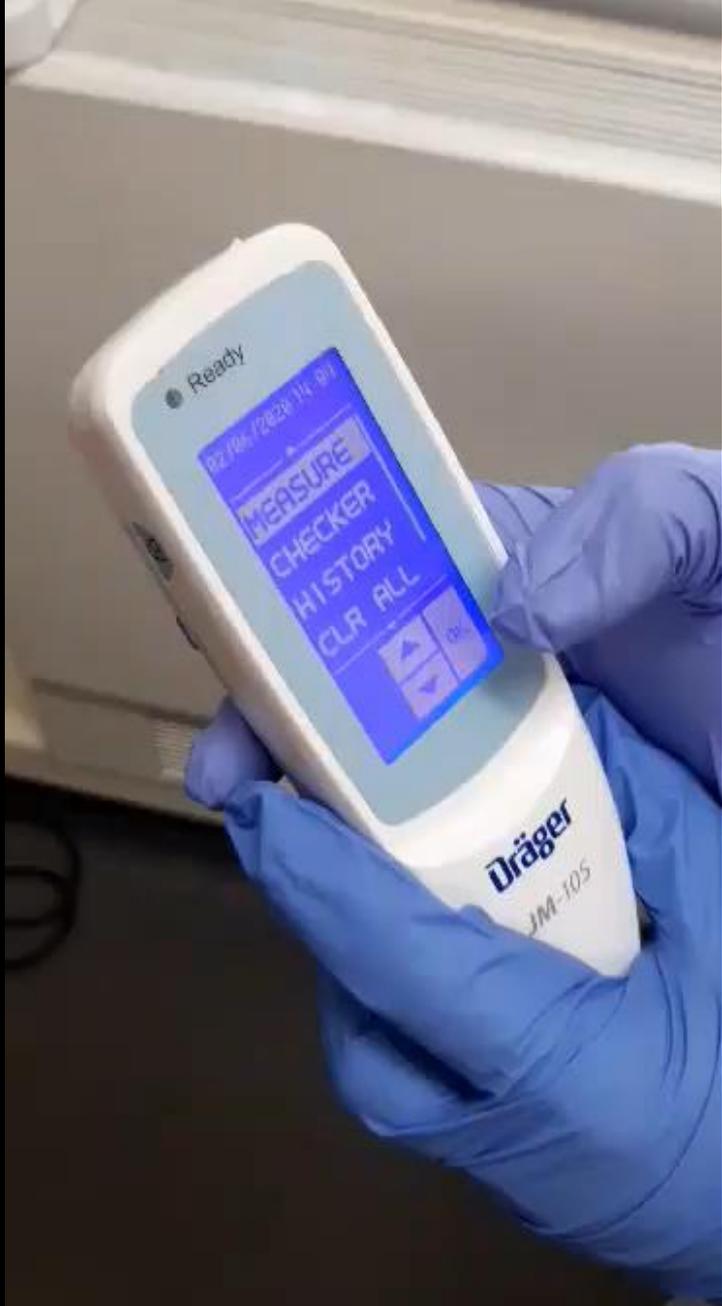
ASSESSMENT

Significant
weight loss

Output

BILLIRUBINOMETERS







CONVERSATIONS WITH PARENTS

REFERRAL PROCESS

POTENTIAL OUTCOMES

ESCALATION

JAUNDICE PREVENTION



PROS

- ❖ *User friendly*
- ❖ *Baby friendly*
- ❖ *Instant result*
- ❖ *Time implications*
- ❖ *Practical*

CONS

- ❖ *Accuracy for BME babies*
- ❖ *Cost**



Q&A Session

NHS England and NHS Improvement



Close

NHS England and NHS Improvement

