



British Association of Perinatal Medicine

Consultation Responses – Bilious Vomiting

Consultation close date – 16 September 2023

Name: Tim van Hasselt	If you are answering on behalf of an organisation please state:
General comments: Overall the document is clear, concise, and gives a pathway to follow for which babies need time critical which need non-time critical transfers which will be helpful for clinicians day to day and for planning local services / local guidelines and pathways. On the list of representatives there is no parental rep listed - were there views of families considered in this document? This process of ruling of malrotation is very anxiety inducing for families and has a big impact on their care for their baby particularly if baby is separated from mother. Has this been considered in the document?	Working Group Response: Yes the framework was sent to a parent group for comment and they helped to write the parent information leaflet.
Specific comments: Page 10: " – a conference call discussion with a tertiary neonatologist and paediatric surgeon is required for transfer to the tertiary surgical NICU. " - in some NNUs and regions the admission for neonatal intensive care and surgical review (including imaging) will take place in a PICU, because there is no co-located surgical NICU. It may be worth mentioning this at some point in the document? This can lead to challenges such as balancing PICU bed demand vs need for urgent neonatal intensive care, and also working across specialities, however conference calls that include PICU, neonatology, surgical, and transport expertise enable this to be managed. Page 12 and 13 - Is it the case that the requirements for NICU radiology services are those of the LNU, in addition to points 1 to 5? If so it may be clearer if the LNU requirements are first, then it could state "In addition to the	A sentence explaining that there are different configurations of services that may mean that some babies may be admitted to a PICU has been added Yes , this has been made more explicit.

requirements of the LNU, a NICU must be able to provide these services"

Page 12 - The guideline states that X-rays are reported within 1 day, are there any recommended reporting timelines and capabilities for cross-sectional imaging or ultrasound imaging of neonates for LNUs and NICUs?

There are no national recommendations about these other types of imaging and generally they are not time critical therefore no recommendation has been made.

<p>Name: Gareth Penman</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: Overall it is useful to have a document to support management of bilious vomiting, including the undertaking of contrast studies, in non-surgical units. And it certainly does go some way in doing that.</p> <p>The one thing I would say is that the contrast is just part of the assessment of a baby with bilious vomiting. Working in one of the biggest newborn surgical centres in the UK, my experience is that surgeons won't be happy to exclude malrotation / volvulus in a baby they've never examined, on the basis of a contrast done elsewhere.</p> <p>Looking at the flowcharts the only situation where you do a contrast without discussion with a surgeon is a preterm baby with no abdominal signs.</p> <p>Hopefully the guidance on training will support radiology services, but if the aim is to reduce transfers you will need to support non-surgical units in making decisions without involving a surgeon.</p>	<p>Working Group Response:</p> <p>A contrast study, if done correctly, should exclude malrotation. Surgical review may be necessary for some babies where other diagnoses are being considered and the framework aims to cover this. The framework intends that most babies should have a surgical review as part of the assessment but this may be avoided for some babies where contrast studies are available on site but surgeons are not.</p> <p>I have added 'and consider surgical consultation' here too but recognise that this will not always be necessary for preterms with feed intolerance.</p> <p>Yes agree with this. This document hopefully goes some way to doing this.</p>
<p>Specific comments: The first flow chart on page 8 - it seems to suggest that baby with evidence of a lower GI obstruction could be returned to their referring unit if the UGI contrast is normal, which would potentially miss GI pathology. Although I do agree that in a term baby with no other clinical signs and a normal contrast is probably fine and could be transferred back.</p> <p>The preterm baby flow chart on 9 - this looks OK actually, and I like that it says for a baby with no other clinical signs it is reasonable to observe for a period.</p> <p>The term baby flow chart on 10 - it appears that almost any term baby with bilious vomiting should be referred to a surgeon, and in my experience the contrast is only part of their assessment which normally includes examining the patient. The only exception is raised inflammatory markers / evidence of infection, and I would worry that will falsely reassure those in non-surgical units.</p>	<p>The charts have been renumbered to make this clearer. The first chart refers to Figure original 2 which clarifies this. It suggests a surgical review should occur and if surgical pathology is suspected then the baby would not return.</p> <p>Thank you</p> <p>The suggestion is that babies should be examined and have a blood gas and AXR. Those with abnormal abdominal examination or an abnormal x-ray would be referred to a surgeon. It is only babies with normal examination, normal x-ray and raised inflammatory markers who would not be referred. An additional comment to keep these babies under review and refer if appropriate has also been added.</p>

<p>Name: Sam Oddie</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: I think this is a good document, and hopefully injects both a level of common sense and consistency into this area.</p>	<p>Working Group Response:</p> <p>Thank you</p> <p>You are correct this figure is for the number needing contrast studies to exclude malrotation. Only an estimated 6% of these will have malrotation ie 1 in 8500. This section has been to changed to reflect this.</p>
<p>Specific comments: on page 9, in the section about preterm babies, there is a statement that the incidence of malrotation is estimated at 1 in 500 babies. This seems rather high to me based on experience, and doesnt fit with the number mentioned earlier as needing transfer. I wonder if it was meant to imply that the population birth prevalence of malrotation leading to volvulus (in term and preterm babies) is 1 in 500? If it was, I think reconsidering this figure, and if retained, adding a reference for it might be wise.</p>	

<p>Name: Jeremy Jones</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: The document is welcomed, and I think is a good starting point. I do have some specific comments based on the radiology section - as a paediatric radiologist with an interest in neonatal imaging working in Scotland.</p>	<p>Working Group Response:</p>
<p>Specific comments: Page 12. Point 1: ... neonatal films should be reported by a paediatric radiologist ... I don't think that this is true (speaking as a paediatric radiologist). There are radiologists who work in units with neonatal units who have an interest in paediatrics and who are more than capable of reporting these studies. I think that this should be reworded to state that they should be reported by paediatric radiologists or radiologists with a paediatric interest who have experience in reporting neonatal studies. Page 12. Point 2: ... should be a formal report of every ultrasound ... again, I don't think that that is true either. We (Edinburgh) have many Cranial ultrasounds performed on our unit by neonatal staff and a formal report is not provided for these studies. Page 12. Point 3: again, these do not need to be performed by a paediatric radiologist. In Aberdeen, general radiologists perform these procedures with the Consultant Paediatric Surgeon in the room. Providing there is appropriate training and the right people are around to make good decisions, a paediatric radiologist is NOT always required. Page 12. Point 5: I think that this is aspirational, but I don't think that we can use the word "should". Even in our large neonatal unit with adjacent paediatric hospital with paediatric radiologists, we do not have a regular MDT. This cannot be a minimum requirement. Page 13. Stating that all neonatal films must be reported by a radiologist within the next working day may not be possible. Is that reasonable as a minimum requirement for an LNU? With increasing reporting radiographers does it need</p>	<p>Thank you. This has been changed to radiologist with a paediatric interest</p> <p>The ultrasound scans carried out by neonatal staff should also be reported (by the person doing the scan) and written in the notes. The text has been changed to reflect this.</p> <p>As above</p> <p>The point of this and other BAPM documents is to set standards. This may not currently be achieved and to achieve it may require resources of some kind but this document gives clinicians a national standard which they can use to argue for the correct resources in order for this to be achieved.</p> <p>As above</p>

to be a radiologist? Is there any data from the UK on the turnaround time of neonatal films in these units currently? What happens if this cannot be met?

Page 13.

"Should" be a weekly MDT with paed/neo and radiologist. I think that this is just not feasible for most radiology departments. Again, is there any data to help determine whether this is happening currently or not.

Even if this is not currently happening it is probably best practice and is therefore again an aspirational target. It would be interesting to survey neonatal services to see what the current state is.

<p>Name: Dr David Quine</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: Congratulations on this attempt for form guidance in such a grey area. I specifically like the reduction in urgency when there is normal examination and basic investigations including AXR. Although we might need to change practice and perform AXR out of hours to reduce night call outs for radiology staff when the infants is in the none urgent category. I am intrigued by the notion that we can avoid sending infants with just a spot or two of bile on their sheets, from experience this could half the infants we send for contrast. Did any of the studies quoted look at size of vomit or exclude infants with a spot or two on the sheets?</p>	<p>Working Group Response:</p> <p>Thank you.</p> <p>No they did not but this would be interesting to look at.</p>
<p>Specific comments: Page 8-First paragraph “more than just a spot or two on the sheets”-I am interested in this as we frequently get this type of scenario and the junior has frequently already initiated surgical discussion and transfer, but when you look at the sheet it can be very a small posit or spots as you describe. I would generally not worry about a spot but where is the line ? How do you define this ? I would have thought you could exclude ~50% of infants from getting contrast studies if this was actually followed.</p> <p>Did any of the studies quoted look at size of vomit or exclude infants with a spot or two on the sheets?</p> <p>Page 10-Table Unfortunately, I feel the authors have failed to take into account the different types of neonatal unit and transfer patterns.</p> <p>We are locally luckily situated within the same building as our local children’s unit with contrasts available 24/7, we therefore have extensive experience of not performing an AXR as they are about to get a contrast anyway. We are also nearly always able to send the infant over without performing a septic screen or starting IV fluids, as contrasts are performed so quickly they are able to have a contrast and if normal continue feeding with glucose monitoring. We are able to therefore substantially reduce the interventions that you are now suggesting should be standard. Clearly</p>	<p>Unfortunately not – evidence is lacking in this area.</p> <p>The AXR is to look for other pathology for example evidence of lower GI obstruction which is seen in a significant proportion. Approximately 25% of babies with bilious vomiting have a surgical diagnosis.</p>

this is not the case in many units and these should maybe be options for some eg inter hospital transfer. Even in these I feel it is overkill to require automatic septic screen and antibiotics in an otherwise well infant. I would not feel performing an AXR, septic screen, giving automatic antibiotics or IV fluids should be standard, but should be options depending on local unit set up.

I note you have not mentioned starting iv fluids if any significant gap between feeds or low sugars-fairly obvious but maybe this should be an addition ?

Your table also talks about increase inflammatory markers, but you have not suggested doing any markers such as CRP ? Although you do talk about it later in the text. I personally would not generally perform a CRP at presentation in term infants as has poor predictive value from a low result.

Page 13-

Regards the statement "There should be a weekly multi-disciplinary meeting with paediatrician/neonatologist and radiologist." Not terribly well defined and are surgeons invited ? While I am all for a multidisciplinary approach, I fail to see that a formal weekly MDT meeting is required in all settings, there simply may not be enough through put in all centres. Consider rewording- MDT discussion and continued education/MDT GR but weekly may not be possible/ideal/cost effective. Appears there is little to be learned from a neonatal perspective from weekly meetings, although regular MDT's are great from a CPD point of view.

A significant proportion (8.4%) of infants with bilious vomiting have infection based on the literature – this has been added to the table for clarity. We give antibiotics for much lower risks than this every day so this seems reasonable but individual clinicians or services can choose to configure their local guideline differently. If you have data which shows different results it would be useful to present / publish them.

This has been clarified.

Inflammatory markers meant the CRP but obviously also includes white cell count, platelets or other biochemical markers of infection. This has been clarified.

The CRP should be repeated as suggested in the NICE infection guideline. This has been added.

This is a good standard and we feel is of benefit in larger units but have changed it to regular rather than weekly so that units can decide their own frequency depending on throughput. It may not be currently achieved in all centres.

<p>Name: Joy Barber</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: The entire section on "Minimum Requirements for Radiological services at a NICU" (page 12) has a single reference: 11. British Society of Paediatric Radiology Recommendation for Safe and Effective Neonatal Imaging (September 2009). This reference is 14 years old, and does not appear to be publicly available (I can find no reference to it in published literature, nor on the BSPR's own website). Please could this reference be made available for review, or an alternative reference found which supports these recommendations.</p>	<p>Working Group Response:</p> <p>This is the only reference with any standards. It is hoped this BAPM document once ratified can become a standard.</p>
<p>Specific comments: The entire section on "Minimum Requirements for Radiological services at a NICU" (page 12) has a single reference: 11. British Society of Paediatric Radiology Recommendation for Safe and Effective Neonatal Imaging (September 2009). This reference is 14 years old, and does not appear to be publicly available (I can find no reference to it in published literature, nor on the BSPR's own website). Please could this reference be made available for review, or an alternative reference found which supports these recommendations.</p>	<p>As above</p>

<p>Name: Sumedha Bird</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: The guideline is clear but only provides minimum radiological support levels for NICUs and LNUs. It is the SCBUs that have the most limited availability of radiological support and potentially the highest number of unnecessary transfers of well babies. I think the document needs minimum level of radiological support for SCUs. With no specific standards there is no onus for trusts to provide any radiological support and the likelihood is that babies will have to be moved for basic investigations (e.g. AXR, reporting of films). The guideline</p>	<p>Working Group Response:</p> <p>SCBUs should have the same radiology support as LNUs. This has been clarified.</p>
<p>Specific comments: The target times (page 8) are difficult to meet if relying on an external transfer team to carry out urgent surgical transfers. There is no mention of how these are going to be monitored or the standards units are expected to meet. These times will negatively impact smaller units where there are no surgical services on site and where babies will needed to be moved larger distances to surgical beds. It will also be dependent on surgical teams accepting transfers which is currently the greatest issue we face in our unit. Is there scope for a "just say yes" policy for the time critical moves (similar to extreme preterm births) from smaller units?</p>	<p>These should be set locally by transport teams / Trusts. Target times appear to vary regionally so have been removed from this document.</p> <p>Some of these babies will not need transfer and may just need advice so a 'just say yes' policy would not be appropriate.</p>

Name: Sue Lloyd	If you are answering on behalf of an organisation please state:
General comments:	Working Group Response:
Specific comments: Definition of Time Critical < 2 hours and transfer as a 'Time Critical' need further clarification.	The times have been taken out as these will be set locally by transport services or nationally by the national transport group.

<p>Name: Tim Styche</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: This is a very difficult topic to present a framework for, and I applaud the first draft. I love the colour chart.</p>	<p>Working Group Response:</p>
<p>Specific comments: Page 7 Para 2: "This is usually treated as an urgent investigation." I feel that 'urgent' perhaps needs some clarification as different transport services have differing 'launch-speeds' of their teams - within 3.5h, launched within an hour, and emergency local 999 transfer can represent the variety. Are you saying this is an urgent problem or an emergency problem?</p> <p>Page 7 Para5: "The importance of performing a contrast study is to rule out malrotation and it is only required in the group where this is necessary." Is this sentence necessary? I have unfortunately witnessed clinically well babies that were found to have malrotation on contrast.</p> <p>Page 8 - Table: I am unclear on the 2 hour time-critical transfer time; is this time for the team to dispatch, reach the baby, or the baby to reach contrast?</p> <p>Am I wrong in considering that bilious vomits could be the evidence for upper-GI obstruction and so could also be used in the 12h transfer box?</p> <p>Can I also ask why the panel feels that a 12h transfer for contrast is a 'nurse only' transfer.</p> <p>Page 10 Para 2: "A malrotation/volvulus is possible in babies with these signs and they should be transferred as a time critical transfer." Currently, the Neonatal Transport Group do not have this listed as a national benchmark for time-critical dispatch (within 1 hour from referral). In your following paragraph you mention perforation, and this is a time-critical benchmark (although obstructions and NEC are not).</p> <p>This request for time-critical transfer is also mentioned on the final paragraph on page 11 based on lactic acidosis and tenderness and perhaps could have some further clarification for this request.</p>	<p>The times have been taken out as there is clearly some regional variation in transport services</p> <p>One of the aims of this framework was to review whether contrast studies are always required, There are some babies where an alternative diagnosis is made where they are not needed.</p> <p>The time has been taken out as there is regional variation.</p> <p>Upper GI obstruction e.g. duodenal or ileal atresia would be expected to result in an abnormal plain AXR and a contrast would not then be required.</p> <p>If the baby is well and has normal investigations including abdo exam, AXR, blood gas and lactate then although malrotation is still a possibility and needs excluding this is not time critical as the baby has no signs of volvulus (at that time).</p> <p>The lactate and the tenderness indicates there could be a significant surgical problem hence the need for time-critical</p>

<p>Many thanks, I'm sure there will be great discussion.</p>	
<p>Name: Julie-Clare Becher</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: 1. this will be a very useful document for all units and standardise care for these infants, thank you 2. would be good to know that a parent was involved in the development of this guideline? f not this would be essential in the consultation as all such pathways should be co-designed with families 3. many of the statements assume involvement of a transport team, receiving unit and off site surgeons. these statements should be amended to include those tertiary units where transport/conference calls etc are not required</p>	<p>Working Group Response:</p> <p>Thanks for your comments.</p> <p>The parent info leaflet was sent to a parent group for consultation</p> <p>This has been clarified</p>
<p>Specific comments: p5/6: the focus on the GIRFT report to provide background is great but is there information also from devolved nations here? p7: 'Approximately 60% have evidence of infection'- can this data be provided in the table also or at least a range provided? p8: colour chart- the brackets are large and appear offset. this leaves one wondering whether 'lime' should also be included. Either correct the position of the brackets or the size p8: figure (no number or legend): should the words 'any' precede left hand bullet points, and 'all' precede right hand bullet points? p9, Fig 1: - define large volume; - check NG position means usually an xray. I'm surprised that this is being recommended for such a common and frequent issue. I would regard this as an investigation with an unacceptable level of risk for most babies. Also in my experience a malpositioned NGT is rarely the diagnosis. as such is should come lower down the list in management, and it would be prudent to suggest that there POCUS/USS is available, placement should be confirmed by USS in preference to XR where expertise allows.</p>	<p>Unfortunately not, but this would be useful information to collect.</p> <p>Data around the risk of infection has been provided in the table. The 60% figure was incorrect but there is a small but significant risk of infection. This is from the references provided. The data have been added to the table.</p> <p>Brackets have been corrected so that lime is not included,</p> <p>This is difficult as there is no data to back it up</p> <p>Reducing feed volume has been added</p>

- consider holding feeds- can other possibilities be included here such as slowing frequency or reducing volume of feeds?

p9 - Management- Has the baby open bowels? change to opened or moved

p10, Fig 2 and management:

- while it is prev stated that 60% of babies have infection, this is not our local experience. Most of these term babies are very well, they go from PNW directly to radiology without blood gas or NGT , and return to PNW if contrast is normal, without NNU admission or antibiotics. Again I would consider the requirement for gas and antibiotics +/- AXR which generally results in an NNU admission, to afford an unacceptable level of risk for most babies.

AXR as a modality to exclude malrotation is poor and is no longer asked for by our surgeons who instead mandate a contrast study. Why is this investigation with such poor predictive value feature so prominently in this document?

p11. section 3. upper gi contrast. this should refer to the first diagram on page 8, which does not have a figure number or legend.

This has been changed

The infection risk has been clarified and the data added to the table.

It is possible that references reflect a selected population and more data would be helpful – it would be helpful to audit your practice and present or publish the results if they are different.

The AXR is to exclude other surgical pathology such as lower GI obstruction eg Hirshsprungs. Identification of this avoids the need for an upper GI contrast study.

A reference to the flow diagram has been added here and the flow diagrams have been renumbered to aid clarity.

<p>Name: Janet Berrington</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: Thanks I think this is a useful area for guidance, but I feel this should be restricted to term and near term infants as preterm infants will a) be looked after in a neonatal unit anyway and b) are actually very different, with many preterm infants having bilious aspirates that do not require the response suggested in this document.</p> <p>I would suggest restricting the radiological criteria to those relevant to abdominal presentations, ie remove the bits about brain imaging</p> <p>I would suggest recognising that local teams will have preferred local pathways in terms of both advice and moving babies such that discussion may be with either the tertiary neonatal teams (as is the case in the North) or with the surgical team, rather than dictating first approach is to surgeons</p> <p>I would also caution against a conference call as the first step - surgeons may be in theatre and delay may be caused. Neonatal consultants are well placed to offer stabilisation support and identify a baby that requires transfer to a surgical centre, and the surgeons can be updated after that step.</p> <p>Figure two - 'upper obstruction' and 'lower ... obstruction' can just be replaced with obstruction as management is the same</p>	<p>Working Group Response:</p> <p>The aim of including preterms was to highlight this and the interventions for this group do not include routine investigation as most will have feed intolerance.</p> <p>The aim is to include guidance on radiology generally as this was highlighted in GIRFT</p> <p>Agree but many babies will require surgical input. This is a national framework, local guidance can state this.</p> <p>Local procedures differ. There should be a surgeon available to take referrals and in regions where conference calls have been used they have been found to be useful.</p> <p>It is useful to differentiate and so that people realise both can present this way.</p>
<p>Specific comments:</p>	

<p>Name: Matthew Babirecki</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: Very helpful document. I think it is something that I could see being developed into a network guideline so we have a consistent approach.</p>	<p>Working Group Response:</p> <p>Thank you</p> <p>This has been added</p> <p>This has been added</p>
<p>Specific comments: Minimum Requirements for Radiological services at an LNU - Page 12 I feel there needs to be more mention of SCUs. Many term babies that have malrotation will be born in smaller units. In fact the relative risk of malrotation is possibly higher because we don't have as many sick/preterm infants. However the absolute numbers will be smaller because we tend to have fewer deliveries (although some SCUs are similar to LNU levels of activity). So the bottom line is that SCU staff need to be vigilant for these rare cases (which is why this work is welcomed). Anecdotally, I think the paediatricians in small DGHs are poorly supported by radiology (we only have 1 part-time radiologist that I would trust to look at a neonatal x-ray). We probably can't expect the same level of radiology support as an LNU, but some minimum requirements would be helpful.</p>	

<p>Name: Pam Cairns</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: It is good to have national advice for when a contrast study for bilious vomits can be done in 12 hours rather than being regarded as time critical. This is a key change and should be made very clear. However this document as it currently reads will increase the number of admissions to our NICU, increase exposure to antibiotics and increase anxiety about feeding extreme prems.</p> <p>National guidelines that use the word "consider" usually result in this action being applied due to concern that failure to do so will result in the clinician being regarded as not following national advice and thus potentially negligent.</p> <p>The document does not address the usefulness or not of abdominal USS to exclude a whirlpool. is this potentially useful? could it be used more widely to screen babies as high or low risk? Could a telemedicine approach be used between specialist and general radiologists to report the contrast in real time so that the baby stayed put in its local unit?</p> <p>This would be a significant achievement - if we could identify the low risk babies and have imaging occur locally, ideally with no IV fluids or admission to NICU.</p> <p>For those who need transfer, a discussion of when a drive through approach (so no admission to a tertiary NICU cot) was appropriate. This is our current practice, we would struggle to admit this group of infants due to capacity.</p>	<p>Working Group Response:</p> <p>Thank you</p> <p>I was not aware that ultrasound was useful in this context but note there are some case reports which suggest it is useful. I do not think this is currently widespread but will include a reference to it.</p> <p>This is what the framework is trying to achieve</p>
<p>Specific comments: Page 9 figure 1. surely bile in an aspirate does not carry the same significance as a bilious vomit? Is it helpful to lump all babies 22-33+6 weeks together? maybe a different approach for the under 28 weeks?</p> <p>There has been much work done encouraging staff to feed through a green aspirate in the sub 28 weekers (with an innocent abdomen) in many units. This guidance would seem to suggest that we should be considering contrast studies if it persists (more that 2? what is a large aspirate? should we be doing aspirates anyway? - note the current neogastric study)</p>	<p>This is the intention of the guideline. Contrast studies in this group are likely to be rare but we did not want to exclude the (very rare) possibility of volvulus in a preterm</p>

Not every unwell baby has NEC - it might be clearer to spell that out. (as the default is usually to assume NEC and thus miss the volvulus).

Page 10 figure 2. This would be better split into well term babies and unwell term babies.

Well term babies with an innocent abdomen and a normal AXR need a contrast study within 12 hours - good to be clear about this and will ease regional transports. However many are completely well. An isolated bilious vomit is not by itself an indicator of sepsis and does not warrant antibiotics. If the baby go from the postnatal ward to radiology and has a normal contrast then they should not need to be on IV fluids, have antibiotics, be admitted to NICU etc. We just contrast them immediately and if all well they continue feeding on the postnatal wards with mum. If they need to be transferred for a contrast (see my previous thoughts on this) then I agree IV fluids are appropriate. Not sure that antibiotics are necessarily indicated but could be considered.

Unwell baby - in the early stages of an acute volvulus there may be minimal abdominal signs - but a rising lactate. A bilious vomit and a rising lactate in a term baby should lead to a high suspicion of volvulus. I would disagree with the flow chart that suggest they are just started on ABs and kept under review.

page 11. radiology

This seems fairly generic for neonatal radiology services. Could a section be added to discuss the use of a telemedicine approach and to specifically address the usefulness or not of USS to look for whirlpool.

Agree – have included reference to gut dysmotility

In the published studies a proportion of babies have infection. These data have been added to the table. We often give antibiotics for much lower risks than this. It is possible that references reflect a selected population and more data would be helpful – it would be helpful to audit your practice and present or publish the results.

Local guidelines could vary if the risk is perceived to be lower.

An additional arrow has been added to the flow diagram to reflect this concern. Repeating the lactate is probably important as a lactate which persists or is rising is more likely to reflect a significant problem.

It is generic. There is little national guidance on this. Telemedicine and use of ultrasound in this context are not yet widely available but may be useful additions in the future.

<p>Name: Rhiannon Jones</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments:</p>	<p>Working Group Response:</p>
<p>Specific comments: Parent information leaflet: P1. What is bilious vomiting. However, in some babies, it can be a sign of something is wrong and can change to :it can be a sign THAT something is wrong P1. What happens if something.... Depending on which hospital you baby has been born at - change you to your. - depending on which hospital YOUR baby has been born at The whole document needs tidying up, some missing coma's Members working group. Some names and titles have a full stop at end of where they work, others don't. Rhiannon Jones (Me) my title is Advanced Nurse Practitioner (not Advanced Neonatal Nurse Practitioner) Page 6 Section: Several other important findings with regard to radiology were revealed from the GIRFT visits: Some full stops missing at end of bullet points Pages 8 and 9 Flow diagrams. Appear confusing ?change colour of arrows – separate colours for contrast/surgery side to non contrast surgery side Page 9 Section: Management Some full stops missing at end of bullet points Page 12 and 13 Section minimum requirements Some full stops missing at end of bullet points Paragraphs through out need formatting</p>	<p>Thank you. All of these wording changes have been made.</p>

<p>Name: Eleri Adams</p>	<p>If you are answering on behalf of an organisation please state: SONEt Transport Service</p>
<p>General comments: it is well laid out and provides some clarity in about expectations and standards which is very welcomed. For the Radiology service expectations could there be more consistency in the order and topics covered in the NICU list and the LNU /SCUlist so it is easier to see what is the same and what is different (I have explained a bit more in the specific comments section</p>	<p>Working Group Response:</p> <p>This has been clarified.</p>
<p>Specific comments: p8 Transfers of babies with Bile stained vomiting graphic - Transfer within two hours needs clarification - do you mean time from start of call to transfer team arriving with patient, or start of call to arrival at destination? etc. Time critical has a particular meaning (and the terminology is being changed to immediate dispatch) and this 2 hour window doesn't fit with this. Immediate dispatch (previously time-critical) = 1 hour from start of the referral call to transport team leaving) p8-10 Transfers of babies with bile stained vomiting info - there is no mention of who is required to transfer these patients. neonatal teams do transfers between neonatal units but do not do transfers for babies from A&E to surgical centres for example. Somethign about local services having pathways in place for prompt transfer of these infants if they present outside a neonatal service. p12 NICUs - there is nothing in the NICU section on the radiology support expected in terms of hours covered by paediatric radiology whilst there is in the LNU section etc. Many of the things listed in the LNU section also apply to NICUs (eg. 24/7 on-site radiographers - please note that they aren't always on-site in some of the NICUs so wondering whether it would be worth specifying. Similiarly there are things missing from the LNU list like formal reporting of every ultrasound for example (many LNUs will be doing cranial scans themselves) . Regular multidisciplinary meetings - specify a minimum frequency - otherwise could be once a year! Requirement for cardiac ultrasound capability in NICU?</p>	<p>There is clearly some regional variation so the times have been taken out</p> <p>We have added detail about local teams</p> <p>This has been changed to reflect this.</p> <p>This has been included</p>

<p>Name: Burak Salgin</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: The proposed framework deviates from current practice standards in many centres/networks. How confident is the group that the proposed framework will not make patient care less safe?</p>	<p>Working Group Response:</p> <p>The multidisciplinary group met and reviewed the evidence and put together this framework based on a consensus for best practice.</p>
<p>Specific comments: The parent leaflet starts with "Bilious vomiting is when there is a significant (more than just a spot or two on the sheets) quantity of green (usually dark green) not yellow vomit. The following chart is also helpful."</p> <p>1. Are 3 spots of vomit significant and do these need to be of a specific size in order to be significant?</p> <p>2. Is there data to suggest that bilious vomiting is usually dark green?</p> <p>3. I am not convinced the chart is helpful and it may turn out to be dangerous if used.</p> <p>3A. How is anyone supposed to be reassured by a non-dark-green vomit - is there literally no chance of a neonate with light green vomiting having malrotation and/or more? If so, what is this conclusion based on? Has the group considered that there are data to suggest otherwise.</p> <p>3B. The top part of the curly bracket marginally extends into the vomit colour "lime". Are you therefore suggesting that light green vomiting can sometimes be a problem that needs urgent clinical attention?</p>	<p>This is hard to define and not based on published evidence</p> <p>If it is not green it is not bilious. The framework is trying to exclude those cases of vomiting without bile which may have different causes– see references.</p> <p>Is there any evidence for this? We could not find any and the consensus was that bile vomiting was green.</p> <p>This has been corrected</p>

<p>Name: Hannah Shore</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: Clear document covering all aspects of care. I like the flow charts and the differentiation between preterm and term. I like the clarity that if you think this may simply be infection to be brave and not over investigate.</p>	<p>Working Group Response:</p> <p>Thank you</p>
<p>Specific comments: Figure 1 - I am confused between the non time critical including infants with a normal xray where further up you state that you can have malrotation (and thus risk of volvulus) with a normal xray.</p> <p>Does the section on radiology services need including -this feels more like a service spec than a clinical framework.</p> <p>I am anxious on the amount of weight put on the colour chart and wonder if there needs to be a caveat that yellow vomiting isn't always innocent and how to manage persistent vomiting.</p>	<p>Malrotation (with a risk of volvulus) but not volvulus therefore not yet time critical</p> <p>Agree that the two parts are different but both came from the GIRFT review and included radiology</p> <p>The wording has been changed to reflect this.</p>

<p>Name: Lorna McKerracher</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments: Useful document describing extent of problem and variability of practice across the country.</p>	<p>Working Group Response:</p> <p>This is a good suggestion and the document has been changed accordingly.</p> <p>This has been added</p> <p>This has been reworded to clarify.</p>
<p>Specific comments: -Could the information contained on pages 9 and 10/11 respectively be swapped so that there is continuing discussion about term babies before reserving discussion about preterm babies til the end? I think this will improve the flow of the document.</p> <p>-In the existing Figure 2, on page 10 I think there is a missing downward arrow between the uppermost blue box going to the box saying 'abnormal pH/lactate.</p> <p>-In the discussion about the preterm baby it might be useful to acknowledge/reference that feed intolerance due to preterm gut dysmotility is common during the establishment of enteral feeds particularly. Definitely important to consider withholding feeds with bililous aspirates +/- vomits but also need to acknowledge the significance of the decision to stop feeds completely in an extreme preterm and that dong so is not without its own risk.</p>	

<p>Name: Hannah Brophy</p>	<p>If you are answering on behalf of an organisation please state: Liverpool Women's Hospital, Alder Hey Children's Hospital</p>
<p>General comments: Generally well written and well referenced</p>	<p>Working Group Response:</p>
<p>Specific comments: As a neonatal intensive care team, the main comment was about "Non-time critical" transfer. We all felt that 12 hours is too long. The reason being is that sometimes a baby with malrotation can intermittently volve – and be well with normal gas/ lactate until the volvulus doesn't un-volve. At that point they can get sick very quickly.</p> <p>We discussed this with our neonatal surgical team at Alder Hey Children's Hospital who unanimously made the following comments:</p> <ol style="list-style-type: none"> 1. "The guidance is is that these neonates need transfer "within 12 hours". In contrast, babies with surgical signs need transfer within 2 hours. We do not recognise this distinction and would advocate for urgent transfer for all neonates with bilious vomiting. " 2. "Neonates with abdominal surgical signs are ones to be transferred immediately (not within 2 hours) as these signs do, in fact, mean the gut is already compromised." 3. "It says that If there is a sign of upper or lower GI obstruction it warrants a time critical 2 hour transfer. Bilious vomiting is a sign of upper GI obstruction, therefore, all patients on the bilious vomiting pathway are time critical. " <p>As a neonatal intensive care team and neonatal surgical team we also felt there could be perhaps a clearer statement about the difference between bilious vomits in a term baby and bilious aspirates in a "well" preterm baby being usually a consequence of poor gut motility (along with other differentials as stated).</p>	<p>The 12 hour and two hour recommendations have been removed as there is clearly national and regional variation</p> <p>We agree and have removed the times and local services can agree responses.</p> <p>Many babies with bilious vomiting do not have a cause found and do not have upper GI obstruction – see references.</p> <p>The framework clearly differentiates between preterm and term babies in the flow charts and the text.</p>

Name: Elizabeth Pilling	If you are answering on behalf of an organisation please state: Sheffield Teaching Hospitals NHS Trust
General comments:	Working Group Response: This has been clarified
Specific comments: Figure 2-(accepting it is very difficult to get flow charts right!)- I worry the central section could be misinterpreted so a baby with abnormal lactate/acidosis who has "evidence of infection" does not get a surgical review. I think it needs to be clear that this is for babies who have a normal AXR and abdominal examination-maybe add in another box to make this clear or add these findings to the "evidence of infection" box.	

<p>Name: Shazia Sharif</p>	<p>If you are answering on behalf of an organisation please state: BiliBEAR Study group</p>
<p>General comments: Overall, very little new information or recommendations - see below for specifics All recommendations and guidance needs to be evidence-based. We have concerns about the parent information leaflet.</p>	<p>Working Group Response:</p> <p>We have tried to make the framework as evidence based as possible</p>
<p>Specific comments: We are a group of clinicians with an interest in this subject, and have the following comments: In a term/near-term neonate presenting with bilious vomiting, the presence of a normal antenatal ultrasound scan, the presence of meconium-stained liquor & sepsis markers, normal clinical examination (distension, tenderness), and normal abdominal X-ray reduces the chance of them being diagnosed with malrotation. However, the above does not entirely rule out the presence of abdominal surgical pathology. In the summary of evidence (page 5, paragraph 4), you have shown that an average of 8% of neonates are diagnosed with malrotation/volvulus. Our first concern is that a language of trivialisation (“minority” and “only”) has been used. 8% (1 in 12, as mentioned in the parent information sheet) is a significant risk and should be objectively stated. Significant economic and human costs are related to the referral patterns associated with this pathology, which are not considered/mentioned in the document. We recommend these factors be acknowledged. Our second main concern is that the parent information leaflet is misrepresentative about the colour of the vomitus and could lead to false reassurance. The parent information leaflet is skewed to bilious vomiting being the 'grass green' colour and may falsely downplay the yellow vomit. The proposed colour chart's evidence base and associated references need to be indicated. Our concerns are based on the preliminary results of our study, BiliBEAR, summarised below. Also, a parent representative must review the parent leaflet before dissemination.</p>	<p>We understand these concerns but do not want to overstate the problem or create alarm for parents, The risk is objectively stated</p> <p>The data from your study sounds useful and informative and we are happy to include it when published</p>

Pre-term bilious aspirate is a different topic and cohort to the problem this forum is primarily trying to address. We suggest this is either taken out of this document or is accordingly signposted in the document without going into the details. Regarding the details, most preterm babies will have gut dysmotility within the first two weeks of life, which is recognised and evidenced. There is no mention of this as a diagnosis, and the volume of aspirate needs to be quantified - small vs. large, i.e., >2/3 feed or >3ml in baby NBM.

Additionally, in the transfer of babies with bilious vomiting, first box, why has time-critical been stated as < 2 hours when the National Neonatal Transport Group (NTG) standard is within 1 hour?

We have completed a two-year prospective study (BiliBEAR) and are in the process of analysing our data. Our data at the end of the first year (abstract presented at the RCPCH spring meeting 2023) shows a pattern of higher referrals to a regional transfer service of neonates with bilious vomiting yet a decline in the prevalence of surgical pathology. We need to do pre and post-test probability in our current cohort of the markers to look at risk prediction.

Summary of 1st year of BiliBEAR study
London NTS conducted a prospective observational study looking at the colour of bilious vomit in term babies presenting with bilious vomiting who were transferred for contrast study between April 2021 and March 2022. The colour of the bilious vomit was assessed using a standardised colour chart (available on request). The colour of the bilious vomit was recorded on the chart divided into four quadrants for analysis and correlated with the outcomes.

We had 142 babies in the study, 133 undergoing an upper GI contrast study. 37.7% had evidence of infection, and 3.6% had evidence of an alternative surgical diagnosis, such as lower GI obstruction. 11 (8%) of upper GI contrasts were abnormal. These babies underwent laparotomy (volvulus/malrotation = 8, gut atresia = 2, dilated loops = 1). We found no significant association between the colour and UGI findings of malrotation (p=0.52). We will publish and share all results as they become available. We thank you for considering our comments.

The parent document has been reviewed by a parent group

The transfer times have been removed as there is clearly regional variation

These results seem to be in keeping with the literature. When this is published we are happy to include and reference it

<p>Name: Bhanu Lakshminarayanan</p>	<p>If you are answering on behalf of an organisation please state:</p>
<p>General comments:</p>	<p>Working Group Response:</p> <p>The transfer times have been removed as there is clearly regional variation. The response time should be from the point of referral.</p>
<p>Specific comments: In the flow chart about time critical transfer, is it possible to clarify the 12hrs limit for non- time critical transfer. Is this from onset of first bilious vomiting or when the local team are concerned enough to request surgical opinion.</p>	