Consultation responses – Routine pulse oximetry testing for newborn babies
Consultation close date – 27/08/24

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Name: Renton L'heureux	**If you are answering on behalf of an organisation please state:**
General comments: Great - I am a fan. The 24 hour cut off is my major worry. The focus should be on performing the test when it is practicable to do so - not time dependent - i.e. before discharge in a clinical setting OR [ideally] less than 24 hours but as soon as is practicable. The only must should be not doing it before 2 hours after delivery. The visual cards are a master stroke - extremely well done. Thanks for the framework.	**Working Group Response:** *Thank you for your supportive comments.* *We agree that there is some inconsistency in the draft document - 'certainly before 24 hours' appears in the executive summary and 'if possible…' in the protocol (page 10) and we accept that the word 'certainly' is inappropriate.* *With regard to the 24-hour cut-off the words We have changed the wording in the document to:* 'Testing should ideally be performed in the first 24 hours…'
Specific comments: The wording should not be to do the test in relation to 24 hours as there is no real evidence - and the table on page 10 makes it "locally dependent". The word "certainly" should be removed [replaced with "ideally"] from "certainly before 24 hours". The 24 hour cut off should reflect a recommendation not a must. The following statement may need adjusting - "Identifying low saturations in the first 24 hours after birth is likely to improve outcomes for many of the conditions causing hypoxaemia" - this should be phrased "identifying low saturations as early as possible is likely to improve ....". Although the 24 hours is consensus driven, I feel the wording should not emphasise 24 hours as a "must" or "should". I kindly propose that the team consider saying that the test should be done "before discharge from a midwifery led unit, clinic or hospital but not within 2 hours of delivery" And then the framework could make recommendations about ideal timing being 4-8 hours [or immediately before discharge, if in a clinical setting OR within 24 hours of birth if the delivery was at home]. Our unit does the pulse ox as routine so there is no disagreement from me about its benefit.	

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Name: Dr Pravin Sreedharan	**If you are answering on behalf of an organisation please state:** UHMB Paediatrics and Neonates
General comments: Excellent document - very thorough	**Working Group Response:** *Thank you for your supportive comments.*
Specific comments: 1) Does the BAPM team recommend a particular type of oxygen saturation monitor or lead or have a list of recommended kits and training packages so everyone knows how to do the oxygen saturation check appropriately using BAPM Standards? 2) Could there be a section of oxygen saturations in the parents information leaflet - like a table to help them understand what numbers we are looking at and what it means? Parents may get fixated on numbers but if they know the numbers it may help alleviate anxiety. 3) Maybe include in the protocol that if there are confirmed differences in pre and post ductal saturations 4 limb BPs should be checked and a senior paediatric review must be sought. 4) for Post-ductal saturations - is there a preferred limb to check? normally we do left leg - is there a difference if we do right leg? maybe this could be explained in the document that either leg could be used and would not make a difference. 5) I think our Ambulance services should also be made aware of this for Babies born outside of a hospital setting or a planned home birth - so paramedics are also able to do this if a midwife was not available due to for example an unplanned home birth or unplanned birth before arrival to hospital, this also be taught to Emergency department staff too if a baby is brought in after birth and unwell 6) Darker skin baby - I think it needs to emboldened that it may be difficult to get cyanosis and if struggling to get oxygen saturations that is a red flag and baby needs urgent paediatric/medical review. I have had a	*1. Our broad recommendations for monitors and leads are described on page 17 but we have not recommended a particular monitor. Individual units and networks have developed their own training for PO testing. The document describes the BAPM standard and gives guidance on training.* *2. We do not think that the additional information on oxygen saturations would be useful for parents* *The view of our parent representatives is that this would perhaps create more anxiety.* *3. A consistent difference of >2% will lead to a senior paediatric review if the protocol is followed. We are not aware of any convincing evidence that 4 limb blood pressures are clinically useful and we would not recommend this.* *4. Both feet are supplied by the post ductal aorta (via the femoral arteries) and should receive blood with the same oxygen saturation. We state 'either foot' in the protocol and this is our recommendation.* *5. We do not think that this test should be performed by paramedics. It may be appropriate for them to measure a baby's saturations in certain circumstances but this would be outside of this framework.* *6. This is a good point. We have modified the protocol to include this possibility (p9)*

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few cases where baby was referred to me as unable to get oxygen saturations but looks well and baby when we checked o2 sats was low and ended up being a cardiac baby!!! 7) I really liked the visual aid for the cot side pulse ox test - really emphasises the ranges. 8) is it worth making a recommendation that a normal pre and post ductal saturation does not entirely rule out an underlying cardiac cause and that if the baby shortly after see's a GP that they recheck this in the community? Otherwise excellent document and I look forward to see it roll out and go through it with our doctors, midwives and neonatal nursing teams. Thank you, Dr Pravin Sreedharan	*7. Thank you* *8. We do make this point on page 11 and 21 (in the info for parents' section) and in the executive summary. We have now given a separate bullet point in the exec summary for complete clarity* **'A normal result is very reassuring but does not completely rule out the chance of a problem developing. Consider repeat testing if symptoms develop or parents have concerns.'** *Thank you very much*

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Name: Karthikeshwaran Thangarajah Muthukrishnan	**If you are answering on behalf of an organisation please state:**
General comments: The information seems ideal and easy to understand with traffic light color coding. Will help to reduce number of unwanted reviews and separation of babies from their mothers.	**Working Group Response:** *Thank you for your positive comments.* *1. The review by a senior midwife or a neonatal nurse is suggested after an equivocal first test. This point has been raised by several respondents and we have modified the protocol so that this point is clearer.* *The text now states:* **'Infants should then have a review by a team member experienced in recognising ill babies (e.g. senior midwife/neonatal nurse/ANNP or tier 1 doctor). The purpose of this review is to ascertain if the baby is currently well. If there are no additional concerns the baby can remain with parents and have a repeat PulseOx Test 1–2 hours after the initial test.'**
Specific comments: In Page 12, the senior review is mentioned as a senior midwife or a neonatal nurse. In most cases, it is usually a junior doctor or a registrar who is called in this situation to assess the baby. This point if highlighted could be useful in reducing delays in reviews.	

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Name: Melanie Dempster	**If you are answering on behalf of an organisation please state:**
General comments: As a trust we have routinely carried out saturation monitoring during the NIPE for well over 10 years now. Whilst I cannot comment from a statistical perspective as we have never carried out an audit, I can safely say we have picked up numerous EoS/cardiac babies at the NIPE who otherwise appeared extremely well. This allowed us early intervention and treatment. I highly recommend that all trusts carry this out as part of NIPE.	**Working Group Response:** *Thank you for your positive comments*
Specific comments: Nil	

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Name: Rachel Drain	**If you are answering on behalf of an organisation please state:** Royal College of Midwives
General comments: Very good resource, clear and comprehensive. I particularly liked the information for parents	**Working Group Response:** *Thank you for your positive comments.*
Specific comments: For page 16 - the section around equipment, I would consider including specifically highlighting that the probes (either reusable or single use) should be compatible with the machine you are undertaking the testing on. Furthermore, I think that it should also be clear that users need to check the appropriate probe is used depending on the birthweight of the baby. A trust I worked in we had a number of issues around the probes used were changed (as a cost saving exercise) to a different supplier and these were not compatible with our machines and were resulting in a number of infants having oxygen therapy that was not necessary. We also, through this exercise, identified that the disposable probes had different weight limits (1.5kg-5kg/<2.5kg/>2.5kg) and so we couldn't ensure accuracy of results if the appropriate probe was not selected for each baby.	*1. We are only recommending reusable probes. It's a good point to ensure that they are compatible (we have added the following sentence regarding this in the exec summary and the equipment section).* **'Pulse oximeters should display a valid CE, CE UKNI or UKCA mark and compatible re-usable pulse oximeter probes are recommended.'** *We are not recommending disposable probes or different probes for different birthweights.*

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Name: Andrew Eccleston Consultant Paediatrician	**If you are answering on behalf of an organisation please state:**
General comments: Framework looks good Easy to understand Looks straight forward to implement Would be happy to follow this guidance in my unit	**Working Group Response:** *Thank you for your positive comments.*
Specific comments:	

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Name: prefer to comment anonymously	**If you are answering on behalf of an organisation please state:**
General comments: Given this is a screening test, why this screening has not been considered by the UK Screening committee for its national implementation?	**Working Group Response:** *Thank you for your comments.* *1. The National Screening Committee has considered Pulse Oximetry screening and has not recommended its implementation. This is stated in the Introduction on page 7 and this decision is discussed in more detail in refs 7- 9.* *2. The summary of evidence is described in the Introduction (page 7) and Background (page 8) and in the supporting references.* *We have aimed to summarise the evidence briefly in this Framework for Practice but those who would like more detailed information are advised to read the references.* *3. We recommend testing at 4-8 hours and if possible within 24 hours. We have included several references to support this decision. In certain circumstances such as early discharge or homebirth earlier testing may be appropriate (as we describe). There is no suggestion that earlier testing in these circumstances has a significantly detrimental effect on test performance (refs 5, 6, 19-22).* *4. There have been numerous health economic analyses including in the UK. We have added this reference (ref 2) and also referenced a UK pilot study undertaken by the NSC (ref 8) which specifically addressed staffing needs amongst other impacts on the clinical service. At the moment around 80% of UK Neonatal Units have successfully introduced PO testing without additional staffing or funding.*
Specific comments: where is the summary of the evidence? how much more effective would pulseOx be compared with usual screening? what impact will this have on outcomes (beyond "better or worse"), given the implications of universal screening and risks of false positives, much mor detail should be provided of the potential advantages of this new screening to be implemented nationally. Also, if NIPE is not recommended before 6h of life to allow for full cardiovascular adaptation, why should this test be performed before 6h? where is the evidence comparing 2h vs 4h vs 8h, vs 24h? We are talking about a critical period of adaptation, to allow full autonomous and free consent, diffenrenced in sensitivity and specificity, and false positive at those times should be reported transparently. Where is the cost/effective analysis? how much would it cost to implement this? how much would it be saved from early detection? what are the associated costs of false positives? and potential impact on bef availability in postnatal wards if discharges are delayed? has it been any implementation study looking into this? has it been any analysis of medical/midwifery staffing needs?	

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Name: Russell Peek	**If you are answering on behalf of an organisation please state:** Gloucestershire Hospitals maternity and neonatal teams
General comments: Clearly there are benefits to introducing universal saturation screening and we welcome the document. However, the framework should recognise the environmental and financial impacts of implementing the guidance and highlight the impact on families of false positive results, including admission of home births to hospital and delayed discharges from hospital. False positive and false negative results could be explained more clearly in the parent guidance Many comments from colleagues identify potential challenges to practical implementation of the framework. Organisations will need to train people to undertake saturation checks within the recommended time window and increase the availability of accurate saturation monitors, particularly in the community. Equipment and training will need to be maintained over time with ongoing cost implications. The use of disposable items (e.g. probes) has an environmental and financial impact.	**Working Group Response:** *Thank you for your positive comments.* *1. We appreciate that this will involve new challenges for those Trusts that have not yet implemented PO testing. However, as we highlight in the Background almost 80% of units (the vast majority of units in each of the UK Neonatal networks) have successfully implemented testing without additional resource and the NSC pilot (ref 8) showed minimal impact on clinical services and delayed discharge. We are confident that there is sufficient expertise nationally and within networks to guide and support the process of implementation.* *2. Our parent information guidance (Page 12 and 22-23) was developed in consultation with Parents groups and has been user tested via our parents' groups reader panel. We feel that the issue of false positives and false negatives is addressed appropriately in language that parents will understand.* *3. We do not recommend the use of disposable probes (see executive summary p5 and section on equipment p16)* *4. The issue of benefit from early detection of hypoxaemic conditions was addressed by an expert working group convened by the National screening committee. Their conclusions can be found in reference 8. We agree that this should be clearer and have highlighted this reference at this section and changed 'All…' to 'The majority of…' p…).*
Specific comments: p7 para 3: "All babies with hypoxaemic pathological conditions would benefit from early diagnosis and, if appropriate, treatment of the underlying condition." Is there evidence that early diagnosis benefits all such babies (note no reference)? p8 "must be completed before discharge" Need to consider home births (who won't have been admitted)? p8 - the pathway refers to senior staff - a middle grade clinician or equivalent. What about experienced ANNPs who are not working at	

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middle grade level - would they be classed as equivalent? p12 - The Amber pathway point 3 could appear ambiguous. "Infants should then have a review by a senior midwife or neonatal nurse and if they are deemed well, and there are no additional risk factors (e.g., for neonatal infection), the baby can remain with parents and have a repeat PulseOx Test 1–2 hours after the initial PulseOx. It is not necessary to re-check the saturations at this review, unless there are clinical or parental concerns about the baby." Suggest mentioning not necessarily rechecking saturations at the first review (by the senior midwife or neonatal nurse) earlier in the sentence to aid clarity. p19 Was the PulseOx test the first time concerns were raised about this baby? perhaps " was an abnormal pulseox test..." p21 para 5 "This will mean that treatment is offered before your baby becomes unwell" Is this true if we are defining babies with low saturations as unwell?	*4. Most babies tested will be born in hospital Births at home are considered separately (see page 13-14).* *5. We recommend middle grade assessment but individual units may consider other staff eligible.* *Thank you. This point has been raised before and we understand that it needs to be clearer. We have now modified the section (see response above) to address this.* *We are not defining babies with low saturations as unwell, we explain on p 23 that they need further assessment.* *For clarity we have changed the sentence to* **'This will mean that treatment (if appropriate) can be offered as early as possible.'**

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Name: Lawrence Miall	**If you are answering on behalf of an organisation please state:**
General comments: The framework is useful and clear and rightly focusses on identifying all cases of hyperaemia not just CCHD. The RED-GREEN-AMBER system is easy to follow and pragmatic. We have for many years used a single post-ductal measure of >=95% as our cut off, so two measures and the need to perform the test earlier (4-6 hours, rather than at the time of the NIPE) will be an additional workload pressure and we will need to consider which staff group undertakes this. The green/red/amber dot tables for the first and second test will be useful. The graphic of the baby on the X and Y axis could be more clearly different- perhaps colour the arm / leg which is being monitored red so it shows up more clearly. The pragmatic decision that not every RED pathway needs an ECHO will aid implementation in smaller and non-cardiac settings. Could we as a community encourage the saturation companies (Masimo, Nellcor etc) to make a baby-foot and baby hand sized re-usable clip-on probe +/- display (similar to what an adult would put their finger into, but larger and wider) , rather than the wrap around probes as this would help save on time obtaining the readings and save on costs?	**Working Group Response:** *Thank you for your positive comments.* 1. *In our opinion a protocol using pre/post-ductal measurements is superior to post-ductal only as there are certain conditions which might be missed by post-ductal measurements alone. We have included references to support this decision (refs 3-6, 15). Most UK units perform pre/post (ref 13) and it is the most widely used internationally (ref 3, 4). It does not significantly increase the time taken to perform the test and in the Framework we have tried to ensure a clear guideline for this* *We agree this would be useful but beyond the scope of the Framework*
Specific comments:	

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Name: Gill MCBURNEY	**If you are answering on behalf of an organisation please state:**
General comments:	**Working Group Response:** *Thank you for your comments*
Specific comments: Page 5/Appendix 2 The parent information leaflet-will this be given to parents during pregnancy? Page 10 Staff who can do the pulse oximetry testing-why aren't HCAs or PAs named in the list	*1.This would be up to individual Trust but we have suggested this.* 2. We have stipulated that the list is not limited. We have identified the groups most often performing the test. There are other possibilities as you suggest.

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Name: Emma Rose	**If you are answering on behalf of an organisation please state:** Royal College of Midwives
General comments: The guidance: The RCM welcomes this guidance and anticipate that it will encourage a standardised approach to pulse oximetry screening across the four nations, thereby supporting our midwife and maternity support worker (MSW) members in providing safe and effective neonatal care in the immediate postnatal period. The title: We recommend changing the title to "Routine newborn pulse oximetry screening for babies born at 34 weeks' gestation and above" to differentiate this as a screening test for well infants, distinct from testing when there are immediate concerns about a baby's wellbeing. This is in line with regional guidelines which already exist (e.g. Guideline for Surfactant Administration (eoeneonatalpccsicnetwork.nhs.uk)) and ensures the purpose of the guidance is clear for our members. Terms used: We note inconsistent use of the abbreviation 'PulseOx' which is potentially confusing. Currently multiple phrases/terms used interchangeably as 'the' or 'a' 'PulseOx', 'PulseOx Test', 'PulseOx test', 'pulse oximetry testing'. Please amend for consistency throughout document. Minor errors noted requiring correction: p.9 Missing full stops at end of first paragraph and at end of first sentence in last paragraph. Point 3 – erroneous full stop after reference number 15. p.12 Penultimate point in red box – erroneous full stop after 'wide'. p.15	**Working Group Response:** *Thank you for your positive comments* *1. We have avoided using the word 'screening' as this test is not currently part of the UK national screening programme.* *We make it clear that the test is to be performed on all asymptomatic babies* *2. We have addressed this and changed to PulseOx Test throughout* *3. Thank you for pointing these out. We have addressed these issues*

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Missing commas in abbreviations list under table 2.	
Specific comments: p4, List of abbreviations: Recommend adding NIPE, NNAP, ODN and QI to list of abbreviations (all referenced on p.3). p5, Point 4: It may be beneficial to include advice on how to undertake pre-ductal screening when the right hand is inaccessible – e.g. due to cannula or absent limb. p5, Point 6: "certainly before" and then "unless this is not possible" is contradictory – suggest rewording to simply state that the ideal time frame is within 24 hours of age. p5, Point 14: Recommend addition of first 2 words: "seek consent and perform the test…" p.8 Amber pathway in flowchart: The flowchart refers to senior midwife review within the amber pathway when defining "experienced staff". There are significant variations in how "senior" may be defined. [C.ref also with p.12.] The use of senior is also interchanged within this flowsheet as later "Senior review4" refers to "middle grade clinician or equivalent". There is therefore potential for confusion in our members' interpretation of this as senior may be defined by grade, time qualified or trained speciality. Please also note the potential ambiguity of the term "experienced staff" – what constitutes experienced? We request that these terms are reviewed and made more explicit. We are also aware of Trust pathways where amber indicates neonatal team review (SHO/ANNP) and request your consideration of this with regards to the scope of midwife and MSW roles. If a screening test results in an abnormal reading, then usual practice for midwives and MSWs would be to refer on for specialist review. The assessment of wellbeing by a midwife would still be appropriate and form part of the information they would refer with, including informing the urgency of referral	*4. Thank you these have been added* *5. We think this is likely to be a rare event and individual trusts will be able to work out a solution to this. For the sake of brevity, we have not advised on each of the potential scenarios that may arise.* *6. Agree, this has been amended (see comment above - P1)* *7. We are not seeking written consent as this is not part of the screening programme. We are suggesting obtaining verbal assent (see page 12).* *8. Thank you. We have addressed this issue also raised by others – see comments above* *9. We hope this is clearer now – see comments above*

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required, but it should not be their decision as to whether additional tests for potential underlying causes can be delayed. Finally, we recommend the addition/clarification of when a review should be urgent to ensure actions in response to the screening are timely – i.e. unwell baby / red pathway requires urgent medical review. p10, Point 2: It is not necessary to differentiate between midwife and community midwife (they are not different professions) – just list as 'Midwives'. p11, First para: In view of this being a screening test, in line with the NMC midwife standards, we request use of term 'consent' not 'assent'. Midwives have a duty of care to seek informed consent for all interventions and procedures from women, including those for their newborn. In line with this and in consideration of the fact that in this instance the patient is the baby, we would therefore recommend replacing 'Patients should be told:' with 'Informed consent should be supported by advising parents:'; and also replacing 'is having the test' with 'Why their baby is recommended to have the screening test' as the current wording implies that the test is not optional. p11, Last para: Dependent on local training, some MSWs will not have sufficient training to deliver informed consent and to provide counselling when parents decline the test. Therefore, we would recommend that the wording be expanded here to ensure those giving counselling have received appropriate training and are able to articulate the risks and benefits of the screening test offered, as well as being able to describe to parents the signs and symptoms of an unwell infant. [continued on additional form submitted due to character limit]	*10. Thank you, this has been changed* *11. See above*

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Name: Emma Rose	**If you are answering on behalf of an organisation please state:** Royal College of Midwives
General comments: (see previously submitted form)	**Working Group Response:**
Specific comments: [Continued from form submitted at 16:13 20/8/24] p13-14, Sections 3 and 4: We are in agreement with the recommendations given for stand-alone midwifery led units and homebirths. However, we recommend review of the use of terminology here to ensure consistency regarding references to homebirth. Currently this section interchanges between homebirth and births in the community. Homebirth is a term that is universally recognised and more specific – this could be expanded to qualify that when referring to homebirths you're including planned and unplanned ones and that local services will decide how post birth care is delivered. Births in the community as a phrase is less specific and therefore could lead to ambiguity. For example, births in ambulances en route to hospital could be regarded as births in the community, but in this scenario there would be no expectation for paramedics to undertake pulse ox screening. p14, First para and point 3: We support the approach taken for management of amber pathways at homebirths. For point 3 we recommend changing 'cannot be performed in the community' to 'cannot be performed in the home' for specificity (assuming we have interpreted the intended meaning correctly). This is because some community settings are clinical locations (e.g. GP surgery). p16, Last section: In line with previous the recommendation to include terminology that supports informed consent, we recommend that the list of what training should include also refers to seeking informed consent for the	*Thank you* *12. Thank you for this helpful comment. This section has been revised as suggested.* *16. Agreed and amended* *17. See above*

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screening and therefore an understanding of the rationale for testing. p17, Accuracy of pulse oximeters in individuals with darker skin: We support the inclusion of this paragraph, however, the term 'darker' is not the correct term to use as it presumes that 'white' is the 'normal' and is comparative. We therefore recommend reflecting RHO terminology taken from their neonatal assessment report – 'neonates of different ethnicities or skin pigmentation'. We also recommend referencing the RHO report recommendations in this section: RHO-Neonatal-Assessment-Report.pdf (nhsrho.org) p20, Appendix 1: This is a very useful visual aid and will support our members to effectively interpret the test results. p21, Appendix 2 - Introduction: In line with comments re p.11, we recommend changing 'will have the test' to 'is recommended screening'. We suggest adding the following bold text for clarity to parents: 'offered to all babies over 34 weeks' gestation within the…' p21, Third para up: Based on our experiences of working with families in the postnatal period, we believe the phrase 'the way your baby is handling' is a phrase used more commonly by clinicians and may not be understood by parents or translate well. We suggest as an alternative something like 'your baby's movements and response to your touch'. Thank you for the opportunity to comment. [END]	*18. Thank you. We have used the term 'darker skin' to be consistent with the terminology used in the RHO report on pulse oximetry (ref 27, 2023) and ref 16* *This is now referenced (ref 16)* *19. Same point – see above* *20. Thank you. We have changed to* **'the way your baby is behaving'.**

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Name: Catrin Elis	**If you are answering on behalf of an organisation please state:** Powys Teaching Health Board
General comments: Powys Health Board in Wales is a rural/remote setting and has a home birth rate of 9% (higher than 2.5% national average and 6 x freestanding birth centres. We support the birth of around 20% of our women. We do not have an Obstetric or neonatal unit within our health board and common transfer times are 60 - 90 minutes. As a result we were very interested in this document and in particular the impact of false positive PO screening on the women and families living in rural settings. Many guidelines are written with hospital settings in mind and easy access/referral to a medical professional. We were very pleased to note this document as well considering the impact of PO screening on out of hospital births and early discharge. In addition the sensible approach to repeat testing. Our model of care provision reflects the Netherlands study 'Pulse oximetry screening for critical congenital heart disease after home birth and early discharge.' A screening of 4 - 8 hourly does not fit within the model of care provision in most out of hospital settings in the UK either, or in alongside midwifery units, as women may be discharged after 2 hours all being well. For example, we would not want to ask our midwives to stay in a woman's home an additional 1-2 hours to perform a PO screen at 4am, when they could have done this at 2am, gone home and rested before work the following day. More information around the false positive at 2 hours would be helpful.	**Working Group Response:** *Thank you for your positive comments* *Thank you.* *Thank you for this comment. As indicated in section 4 'PulseOx test following a homebirth' we have indicated that the evidence available and cited supports earlier timing of the initial PulseOx Test in this setting (including the Netherlands study [ref 22], as well as the low incidence of false positive results with this timing. Where an Amber Pathway result is recorded, we have suggested a local decision will be required on where and how the repeat PulseOx Test will be performed. The suggestion for the attending midwife to remain in situ for another 1-2 hrs to perform this repeat test is one such suggestion. Appendix 3 provides a range of examples to stimulate local discussion.*
Specific comments: p. 12 Amber Pathway Our model offers women 2 midwives present for their birth. On the Amber pathway the	

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recommendation is for a 'senior midwife or neonatal nurse review'. This cannot be facilitated in the home or freestanding birth centres. All our midwives are expected to have the same level of training to review and escalate unwell babies. There are none with additional 'senior skills' in the assessment of newborns. Where there is no clinical concern/background and an initial amber pathway the decision to remain at home/in FMU to repeat the test could be safely made by the midwife in attendance (who has the full clinical scenario) following a telephone discussion with the senior midwife manager on call. An in person senior review not possible in community. In this scenario, a telephone call to the neonatal unit for an amber pathway, with no additional clinical concern is of limited value at this point and we would expect our midwife to manage and make a care plan for the baby. The neonatologist may not be familiar with care provision in rural, out of hospital settings and their recommendations may reflect this i.e. to just transfer the baby in without repeating PO. The recommendation for out of hospital for an amber with no additional concerns and normal observations, should consider discussion with senior midwife and not automatically contacting the neonatal unit for advice as per case studies in Appendix A. If a red pathway or amber with clinical concern then contacting neonatal unit and urgent transfer is clearly indicated and we have robust mechanisms for this.	*2. Thank you for these comments. As Appendix 3 indicates, the review following an Amber result would be performed by the attending midwives, with a suggestion to contact their local neonatal unit for appropriate advice if concerns. Individual trusts may decide on alternative arrangements which may be more suitable*
We would suggest a recommendation around community escalation process (as described in Appendix 3) to feature in the table. p.10 The data used to inform the false positive rate by hours post-birth is not available in the guideline and would be helpful when counselling women regarding this test. For example, they may opt for an 8 hour PO screen and choose to bring their baby the following day to the birth centre rather than have it done at 2	*Thank you. The references we quote (refs 21-23) indicate that the test positive rate for homebirths (at 2 hours of age) is slightly higher (1% vs 0.7%) but for individuals this will be a negligible difference. We think the option of taking a baby to hospital for the test would represent a greater logistical challenge for the parents but individual Trusts may wish to consider this.*

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hours if they know that there is a lower chance of them needing to take their baby to a neonatal unit and their baby is well. The comment on p. 9 suggests a consensus of 4-8 hourly, however we cannot see the data to detail the difference in false positive when done at 1-2 hourly. This information would be really useful as a service to decide on if we go for 2 hour or 12 hours post-birth. Many thanks, this is a very helpful and useful document and very supportive of the rural/remote care we offer in Powys.	

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Name: Marion Eaves	**If you are answering on behalf of an organisation please state:** NHS England - CHD Clinical Reference Group and Operational Delivery Networks
General comments: Currently the antenatal diagnosis of congenital heart disease is approximately 52%. There are therefore a number of babies with CHD that will be diagnosed postnatally. Critical CHD (CCHD), makes up about a quarter of CHD and is the main cause of death in babies with CHD. Pulse oximetry screening has been shown to increase the early identification of CCHD and to reduce mortality from these conditions. Pulse oximetry testing is a simple, safe, non-invasive test that can rapidly identify babies with CCHD. The CHD Operational Delivery Networks and Clinical Reference Group are therefore supportive of the universal introduction of pulse oximetry screening as described by the BAPM Framework. Overall the Framework clearly describes the case for pulse oximetry testing, is well structured and written, concise and easy to use.	**Working Group Response:** *Thank you for your positive comments.*
Our questions are: What are the protocols for the babies born < 34 weeks? Could it be clarified if they would routinely have a pulse oximetry testing protocols for prematurity?	*1. These babies will normally be admitted to NNU and should follow the recommendation for those babies (see page 13)*
Would be good to specify if the measurement of oxygen saturation is done always at "room air" without oxygen supplement? Taking into consideration that if you are in the amber or red pathway, in some healthcare settings they might start oxygen supplementation, and this will alter the findings.	*2. Thank you. This has been added*
Question on how this will be implemented nationally as a framework – will Trusts be asked to voluntarily sign up? Will there be any targeted promotion of this in Trusts/regions where pulse oximetry isn't currently used as standard?	*3. The framework was funded by NHSE and will be promoted to all BAPM members and wider stakeholders across the UK. BAPM does not have the power to enforce implementation, however, BAPM guidance is accepted as best practice standards across neonatal care.*

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Question on whether there is any support available from BAPM for implementation/training if needed? Will BAPM be collecting and analysing the audit data? Have the UK Screening committee been advised of this framework development and/or asked to comment on the proposed data collection. Will the data collection meet their evidence requirements for consideration of pulse oximetry into the newborn screening programme?	*BAPM will be running a webinar to launch the framework for members (in December 2024). Anyone implementing the recommendations that has a question is welcome to contact the BAPM office to be put in touch with the working group that wrote the framework.* *BAPM does not collect or hold data but the framework provides advice to those that do.*
Specific comments: Appendix 2 – Example Information sheet for parents A normal result is very reassuring but it doesn't completely rule out the chance of a problem developing. If you have any concerns about your baby's colour, breathing, feeding or the way the baby is handling after the test seek urgent advice. Would a new mother understand what is meant by "the way the baby is handling" ? It may be helpful to add examples of changes to look for from a handling perspective (agitated, floppy?) for clarity.	*1. Thank you. We have changed this to 'the way your baby is behaving'.*

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Name: Joanna Behrsin	**If you are answering on behalf of an organisation please state:** Leicester Neonatal Service
General comments: A framework to support pulse-oximetry testing in the newborn is extremely valuable, we continued this as practice in UHL following implementation during the pulse-oximetry pilot. There are some minor differences however between this framework and the pilot protocols. The document is easy to read and the flow-charts illustrating the protocol in particular are very helpful. There is also clarity around when to do cardiac investigations and how to manage a baby in each arm of the flow-chart.	**Working Group Response:** *1. Thank you for your positive comments*
Specific comments: "Page 6: Aim is to use this as a screening tool for all asymptomatic newborns." During the pulse-oximetry pilot subgroups of babies were omitted for screening e.g. known congenital heart disease detected antenatally. The screening test was limited to babies > 34 weeks. "Page 13: section on baby admitted to neonatal unit." We would be keen to understand the benefits of a formalised pulse-oximetry screen before discharge in this group of babies. Many of whom will be monitored extensively during their stay giving opportunity to pick up multiple pathologies.	*2. We have avoided using the term 'screening' as this test is not currently part of the UK national screening programme.* *3. Agree that many babies who are admitted to NNU will have extensive monitoring and investigations, however, this will not apply to all. We wish to create a safety net so that no babies are missed.*

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Name: Marion Eaves	**If you are answering on behalf of an organisation please state:** CHD ODNs and CRG NHS England
General comments: Additional comments to previous submission: The document looks excellent. The flow charts of the pathways are clear and good advice in the red pathway not to order routine echo. From network paediatric cardiologist: I think this has been a long time coming and when I reviewed the Pulseox data over 10 years ago it did increase workload and some false positives but was a great initiative that I thought would eventually make it in and do support. I don't think individual units are routinely practising this formally but we have had some very good pick ups recently from a spot sats check, perhaps because baby looked dusky - a recent TAPVD and a TOF were picked up this way on postnatal wards in peripheral hospitals. I'm not sure if within the document there are guidelines or national recommendations on parameters that trigger a nicu review and then cardiology review but these would need unpicking and clearly setting out so we don't get completely inundated with referrals. It would be useful to have someone from NICU on board as they will know this data well. But a good screening tool in my opinion.	**Working Group Response:** *Thank you for your positive comments* *2. We believe we have addressed this issue in the Framework*
Specific comments: • BAPM recommends the same protocol irrespective of birth location. It involves measuring oxygen saturations from two sites; pre-ductal saturations from the right hand and post[1]ductal from either foot. • I was wondering how this advise could be conveyed to the CHD Networks Level 3 centres? In the recommendations on p5 this is addressed but I feel it needs to emphasised this testing should take place in All locations caring for newborns.	*The BCCA have been close collaborators in the development of this Framework. We emphasise that all newborns 34 weeks or above should undergo this test.*

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Name: Alison Conchie	**If you are answering on behalf of an organisation please state:** Yorkshire & Humber Congenital Heart Disease Network
General comments: We welcome the framework for practice and would support its implementation. Hopefully, this document will encourage all neonatal services across the UK to introduce routine pulse oximetry. Whilst we continue to feel that pulse oximetry has an important role in the identification of previously unrecognised congenital heart disease, it is good to see the emphasis placed on it's wider role in identifying hypoxaemia as a feature of other important conditions. After discussion with Neonatal colleagues, we feel the PulseOx testing protocol is deliverable. One concern we have identified is that babies may be included on the Amber pathway despite a pre/post saturation difference of upto 10% (pre 100 / post 90 – as shown in Appendix 1). We recognise it would be difficult to define an exact cut-off but some clinicians might consider a gap of >5% to warrant inclusion in the Red pathway.	**Working Group Response:** *Thank you for your positive comments* *1. This is an interesting point. We discussed this in detail, but we opted not to change the protocol as this is an unlikely scenario and this change has not been incorporated into any previous published screening algorithm. Therefore there are no data on the effect of this change on test accuracy.*
Specific comments: We agree with the indications for Echocardiography as described. However, we would recommend a rewording or the Prostaglandin guidance on p15. Prostaglandin should not be delayed whilst waiting to speak to Paediatric Cardiology or other specialist teams. We strongly recommend that Prostaglandin infusions are started immediately if the clinical team are suspicious of duct dependent Congenital Heart Disease. A delay may result in harm to the baby. We would suggest the following wording "Do not delay starting a Prostaglandin infusion (Dinoprostone) if there is clinical suspicion of duct dependent CHD while waiting for Paediatric Cardiology opinion or	*2. Thank you. We agree and have changed the wording on page 16 as you suggest*

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echocardiogram. Refer to local or regional guidance as to appropriate starting dose.”	