4.2.12 The Network had concluded that too many IC days were occurring outside the NICUs than recommended in the BAPM 2014 standards. There is a longer term network plan to reduce the number of IC-cot-days in LNUs.

4.2.13 Given that the unit will have been running for some months at Level 1 before any reinstatement of the IC cots, the staff must be supported to maintain their intensive care skills. This could be by temporary rotation to a Level 3 unit or simulation scenarios. Given nurses attend larger tertiary centres when undertaking the ITU specialist neonatal course as 'students' this should be feasible but requires a robust yet supportive HR system to ensure honorary contracts and paperwork are in place.

Recommendation: The organisation should ensure maintenance of skills of neonatal nursing and medical team to ensure that return to level two can be safely managed. Rotation of staff to level three units should be explored

4.3 Does the unit have clear and engaged leadership and good team working?

Yes, generally but there were some areas where communications could be strengthened.

4.3.1 The Review team found extremely positive relationships amongst the various teams that contribute to the neonatal unit. The consultants appeared to be a cohesive group who were proud of the unit and how well they worked together, for example in developing and agreeing clinical guidelines. The senior nurses were very strong as a team and provided appropriate challenge to the medical staff and support to nursing colleagues. The more junior nurses and doctors all spoke highly of the atmosphere on the unit and the accessibility of other staff to assist with questions and clinical advice. The neonatal / paediatric team was reported by other Trust staff to have `far fewer problems than others` and seem to get on well with each other and the nurses.

4.3.2 There were, however, some historical issues around senior level decision making. Some nurses reported that external escalation was not always as timely as it could have been, and nurses did not feel empowered to participate. Although the nurses work to a relatively traditional model, they reported that they will support escalation more "vigorously" depending upon which consultant or locum is on duty. This is not uncommon on a LNU but there should also be a process to ensure that any training needs identified are addressed and that these training needs, until addressed, are recognised as a systemic risk. Relationships are starting to improve although recent events around the reconfiguration had damaged relationships between senior nursing staff and the consultants and this may need active intervention to restore trusting working relationships.

Recommendation: Establish a short term group to examine nurse involvement in decision making, guideline development and transport liaison

Panel. The locality was reported to have a high level of Domestic Abuse and substance misuse.

4.4.21 The Review team was impressed by the processes and links made by the Link Health Visitor, who ensures engagement of families and supports professionals in health and social care to work effectively together.

Child death process.

4.4.22 When an unexpected paediatric death occurs the paediatrician on call contacts the senior investigating officer on site. For neonates the Designated Doctor for Unexpected Child Death is notified directly and he is responsible for advising the Pan Cheshire Child Death Overview Panel (CDOP) administration of all deaths, whether expected or unexpected. There is no automatic rapid response home visit but this is considered, and a meeting to determine next steps is organised within 24 hours.

4.4.23. For the cluster of 13-14 deaths (1 excluded) being considered in this review, not all has been reported to the Pan-Cheshire CDOP, as some were resident in Wales and therefore reported to the Welsh authorities.

4.4.24 The CDOP meets quarterly and has a remit is around learning inter-professional lessons rather than individual case investigation of internal management. The Form B submissions were reported to be very robust, and where possible the CDOP will enlist specialist advice,

4.4.25 The RCPCH Review team was concerned that the CDOP did not appear to be alert to the cluster of neonatal deaths, and for at least some there should have been a Rapid Response Meeting within 5 working days of notification. If the cause of death is not clear than no death certificate can be written and the case must be referred to the coroner. Some CDOPs ask for a copy of the report from M&Ms via the Clinical Risk/Governance team to feed into their panel meetings

Recommendation: The CDOP should consider whether its processes could have detected the cluster of deaths and initiated external review more swiftly

Definition of an unexpected death

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12. In this guidance an unexpected death is defined as the death of an infant or child which was not anticipated as a significant possibility for example, 24 hours before the death; or where there was an unexpected collapse or incident leading to or precipitating the events which lead to the death.

13. The designated paediatrician responsible for unexpected deaths in childhood should be consulted where professionals are uncertain about whether the death is unexpected. If in doubt, the processes for unexpected child deaths should be followed until the available evidence enables a different decision to be made.

and retrieval team due to the increased demand for transfers. This is an unacceptable waste of senior medical time, and should be raised as an incident on DATIX. Other services in the UK create a `conference call` so those giving advice and those on the transport team are aware of the status of infants which may require transfer.

Recommendation: Ensure tertiary advice calls include an `early warning` or conference call to the transport team to enable better planning and deployment of the crews

Recommendation: Arrange for central monitoring and management of transport team enquiries out of hours across the network

4.5.3 Following the case review of a neonatal death in 2014 several changes were made to the transport staffing arrangements. The service now deploys Tier 2 registrars with consultant oversight during weekday daytime, with registrars and ANNPs from LWH covering the service out of hours. There are serious gaps in cover anticipated as Tier 2 rotas become increasingly hard to fill, general trainees have been withdrawn due to inadequate training opportunities, and there are no grid trainees and Clinical Fellows cover the service.

4.5.4 Quarterly reports indicated that no infants were transferred by other teams during 2015-6, but in only 77% of urgent requests in Q4 was the team mobilised within one hour (target 95%). However the target of 3.5 hours to bedside was easily met with over 90% achieved. The transport team uses the NW Ambulance service to provide the emergency vehicle and there is within their protocols for emergency the consideration that an infant in hospital is in a `place of safety` and may therefore not be prioritised at busy times.

4.5.5 An exception report is apparently prepared on infants whose care has not met the criteria for transport and response time, due to availability either of personnel or vehicle. This data supported a proposal submitted to NHS England in 2015 to combine the three ambulance services and 4 hosts (including the paediatric retrieval service, NEWTS) into one service with two host units and network-agreed guidance and protocols in order to meet the national specification for such services. Further evidence for improving transport availability and streamlining pathways emerged from the neonatal surgical peer review in April 2016. The business case is likely to have been consolidated within the STP and no decision has yet been made.

Recommendation: The NHSE/Network should expedite the decision on the whole-network transport service and centralise the administration out of hours in the interim

Antenatal transfers

4.5.5 Antenatal in-utero transfers out of COCH are usually arranged by midwives, who identify a cot (either through the cot bureau or directly) and work with the consultants to

determine whether the obstetric team is willing to accept the patient. Transfers can be as far as Bolton or Leeds which proves frustrating for the women (and for the accompanying midwives who need to arrange a taxi back) especially if they do not deliver, and return again a few days later. There were reports that LWH can sometimes close without warning. The problem is exacerbated since the reconfiguration in July women between 27-34 weeks` gestation in potential labour need to be redirected.

4.5.6 All nine network units follow the same obstetric process for transfer in utero to LWH, and almost all units have a specialist in fetal medicine, who meets twice a year across the network. Antenatal counselling by the neonatal lead was reported to be very good and saves referring women to the tertiary centre.

Activity and outcomes

4.5.7 COCH is the busiest non-NICU in the C&M network with 4800 cot-days (3773 /79% of which were SC/TC days). Analysis by the network of cot numbers and activity in its annual report had identified COCH as an outlier with over-provision of IC cots and under-provision of SC cots. A paper presented to the Network board based on data from 1st January 2014-31st March 2015 sought to permanently re-designate IC cots to match demand for financial and sustainability reasons. Before the temporary change in July, around 96% of infants cared for in COCH were inborn, keeping families local.

4.5.8 The network Clinical Effectiveness Group meets bimonthly, chaired by the Network clinical lead and with representation from nursing and medical leads from each unit. Since January 2016 units have been asked to submit to the group a summary of incidents and learning points for noting, and a review of mortality takes place (cross checked against Badger to prompt reports). In May this included two unexplained deaths at other units where infants had suddenly collapsed. It was not clear what action the CEG takes beyond noting the incidents - the minutes did not record progress on completion of action points

4.5.9 The Network`s `table top` review in January of a death in October 2015 was reported to have triggered improved data collection across other units, and another death in December 2015 also exposed inadequate liaison between COCH clinicians and the transport team. There appears to be no formal mechanism or process for joint M&M review across the network for infants who have been transferred between units, and no mechanism to trigger closure of a unit when it has reached capacity.

Recommendation: Clarify between network and commissioners the arrangements for multi-site investigations and timely implementation of actions

Recommendation: The network should develop a policy for temporary closure of a unit to admissions due to capacity concerns

4.5.10 The COCH team works naturally with Arrowe Park NICU and is considering working more closely together (see3.14). Where neonates may require surgery (e.g. swollen abdomen) there is some confusion about the protocol with some clinicians

contacting the surgical team at Alder Hey immediately, and others talking through the situation with the neonatologists in LWH or Arrowe Park first. These pathways were explored in a surgical review in April 2016 which made six recommendations for service providers and five for the network including a communication improvement plan and a single surgical model to reduce confusion and delays.

4.6 Are there any identifiable common factors or failings that might in part or in whole explain the apparent increase in mortality in 2015 and 2016?

4.6.1 The Review team considered carefully the various pieces of evidence and the overview provided of the cases in question (set out in Appendix 4). The unit took 11% of network admissions but experienced 13% of the deaths in 2015. The consultants had explored a number of factors themselves but not in a systematic way nor following sound governance and root cause analysis processes, and the involvement of the network clinical governance group had been relatively supervisory, working on the summaries of cases rather than examining each in detail .

4.6.2 A number of recommendations have been included in this report which draw out areas of non-compliance with standards or where practice might be improved. To summarise,

- Staffing levels are inadequate; when mapped to the actual activity and acuity of a LNU under the BAPM standards, both from a nursing and a medical perspective.
- Escalation of concerns to tertiary units for advice or transport was sometimes delayed and network agreement to encourage a lower threshold for escalation and discussion is required.
- Most of the infants had undergone a Post Mortem from one of the three perinatal pathologists at Alder Hey but these did not include systematic tests for toxicology, blood electrolytes or blood sugar since the infants died in hospital
- In order to thoroughly examine the issues detailed case reviews of all the deaths (prioritising the unexpected deaths) should be conducted by an independent expert. . The personnel issues cannot be resolved formally until this is completed.

4.7 Are there any areas of concern for which potential development would improve outcomes?

These are set out in the sections above.