Neonatal Services

Scrutiny Board Briefing Paper

August 28th 2008

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The Leeds Neonatal Service

The Leeds Neonatal Service provides Specialist care to newborn infants from Leeds and the Yorkshire Network and is delivered on two sites within the Trust, Leeds General Infirmary and St James's University Hospital.

It is one of the largest neonatal services within the UK providing support to two very large Obstetric Units within Leeds with over 9000 deliveries per annum as well as tertiary services to several Trusts as part of the Yorkshire Neonatal Network.

Approximately 10% of all newly born infants will be admitted to the neonatal service, generally due to being born prematurely or because they have congenital anomalies or perinatal infection. In addition to the two delivery suites in Leeds the service supports the care of newborn infants on maternity wards and provides outreach services to mother and babies across the Leeds Health Community

Neonatal Networks

The Department of Health published the Expert Working Group report on Neonatal Intensive Care Services, April 2003. The Report suggests a more structured, collaborative approach to caring for newborn babies. It proposed that hospitals worked closely together in formal, managed networks, to provide the safest and most effective service for mothers and babies. This would include the designation of some hospitals that were specially equipped to care for the sickest and smallest babies, with other hospitals providing high dependency care and shorter periods of intensive care as close to home as possible. The numbers of hospitals in each network would be for local decision but must reflect local need and geography.

The Yorkshire Neonatal Network was established in 2002 with the purpose of delivering

- Appropriate care for mothers and babies as close to home as possible i.e. within their own network with an end to inappropriate or long distance transfers.
- Ensure equity of access to high quality services.
- Allow collaboration on workforce planning, education, training and clinical governance.
- The concentration of skills and expertise.
- Achieving consistency of care across the Network.
- Structured transport arrangements.
- Agreed categories of care and designation of units.

- Ensure that babies with complex needs or requiring long periods of respiratory support have their initial care in an intensive care Unit (designated level 3).

Unit Designation

Neonatal care is highly specialised and therefore different hospitals within the Yorkshire neonatal network (YNN) have been designated to provide different levels of care:

- **Level 1** Units provide special care but do not aim to provide any continuing high dependency or intensive care. The network has 2 such units (Scarborough and Harrogate)

- **Level 2** Units provide High dependency care and some short term Intensive care as agreed within the Network. There are currently 5 such units in the network (York, Dewsbury, Pontefract, Calderdale and Airedale)

- **Level 3** Units provide the whole range of neonatal care - special care, high dependency and intensive care. There are 3 such units in the network (Leeds, Hull and Bradford). Hull and Leeds provide newborn surgical intensive care. Leeds provides newborn cardiology intensive care in conjunction with the cardiology service[1].

Both Leeds units are designated at Level 3 with Specialist Neonatal Surgery, Cardiology and Neuroscience on the Leeds General infirmary site and Specialist Hepatology and Renal medicine on the St James site. These specialist services cannot be delivered elsewhere within the network.

Also provided by the Leeds Neonatal Service

- Transitional Care
- Neonatal Network Transport Service
- Cot Bureau.
- Neonatal Outreach
- Surgical Neonatal Outreach

Neonatal care levels

Somewhat confusingly, levels of care within neonatal units are described as level 1, 2 or 3. The highest level of intensive care (level 1) tends to take place in level 3 neonatal units.

- Level 1 (intensive care)

- Level 2 (high dependency)

[1] Specialist services defined as those newborn infants who have complex medical needs such as advanced ventilation and nitric oxide and/or need access to specialist surgical, cardiac and neuroscience services

- Level 3 (special care)

- Transitional Care - is a ward that allows the Mother and baby to stay together when the baby requires Level 3 care. The transitional care has both Midwives and Neonatal Nurse providing holistic care to both the mother and baby.

Cot Capacity

Hosp Site	Unit Designation	Level 1	Level 2	Level 3	Total NNU	Transitional Care (Level 3)
LGI	Level 3	9	14	12	35	9
SJUH	Level 3	6	6	8	20	10

The cots are used flexibly across all the levels of care. Neonatal Units are unique as they deliver all levels of care within the confines of one ward. A baby will switch levels of care throughout their admission while remaining on the unit. Using the cots flexibly allows the service to respond to the demand for all levels of care.

Admissions to neonatal units

There are in excess of 9000 deliveries within the Leeds Teaching Hospitals Trust per year and approximately 10% of all newborn babies require admission[2] to the neonatal units. In addition, as a tertiary centre, the unit receives babies delivered in DGHs who require this enhanced level of intervention/support accounting for the higher than 10% ratio of admissions to deliveries within the Trust.

The table below describes the trends in admissions since 1998.

	SJUH		LGI		SERVICE	
year	Total patients	Total admissions	Total patients	Total admissions	Total patients	Total admissions
1998	469	471	753	834	1222	1305
1999	414	419	694	764	1108	1183
2000	468	476	672	740	1140	1216
2001	386	402	668	737	1054	1139
2002	433	455	730	805	1163	1260
2003	437	500	700	778	1137	1278
2004	470	488	737	821	1207	1309
2005	415	431	711	793	1126	1224
2006	433	449	890	951	1323	1400
2007	406	418	773	823	1179	1241

[2] some babies are admitted more than once (especially surgical referrals) and so the admission rate (admissions) is greater than the admission rate (patients).

The advances in complex Neonatal surgery and medicine have seen an increase in the survival of babies who would have previously succumbed. The number of admission per year will vary dependant on the complexity of the interventions required and gestation, as this will determined the length of stay and the availability of cots for admission within the unit. This explains variation in admission rates over the last 10 years.

LTHT is a tertiary centre for many Paediatric specialties requiring a greater link between Paediatrics and Neonatal services within the Trust. The type of support required covers many subspecialties but is specifically evidenced at the LGI site in Paediatric General Surgery and Cardiac surgery where clinical and technological advances are particularly prevalent improving survival rates but requiring an enhanced level of neonatal nursing and medical support.

Occupancy Rates

The Leeds Neonatal Service runs at a total occupancy level in excess of this 70% at all times with an average occupancy over the last 8 years of 90% which is higher than many comparable units. All levels of care can, at times, exceed 100% occupancy due to the flexible use of cots within the service. If we are delivering greater than 100% occupancy at any level of care there will be a subsequent decrease in the occupancy in of the other levels of care. This allows the nurse to patient ratio to be consistent and appropriate without compromising quality of care.

Length of stay

Length of stay is determined by the gestation of the baby and the complexity of care required which may included surgery i.e. the earlier the baby is born and dependant on the surgery required at any gestation the longer they will remain within the service. Most babies are discharged on or around their original expected delivery date.

The recommendations within the Yorkshire Neonatal Network plan are likely to increase the volume of premature babies transferred into Leeds and the impact of this is currently being identified

Leeds babies, within the Leeds units have an apparent longer length of stay as they spend their entire admission within one of the Leeds units whilst non Leeds babies will be repatriated to their local DGH for ongoing care once their level of care becomes aligned with that unit's designation. Leeds Service did at times encounter difficulties in repatriate babies to their local hospitals. These issues are being resolved by the change in the way the Transport team now works within the Yorkshire Network

Reasons for refusals:

<u>Post delivery</u>

We do all we can to fulfil our specialist service to the network and our tertiary service to Leeds residents but on rare occasions we may need to transfer a patient out of Leeds after birth. This occurs approximately 12 times per year.

[2007 data: 15 babies transferred out after birth, 10 to other units in YNN, 5 to units out of region, of which 2 needed specialist services] This is usually due to the units in Leeds being at or over capacity and the babies are repatriated to Leeds at the earliest opportunity.

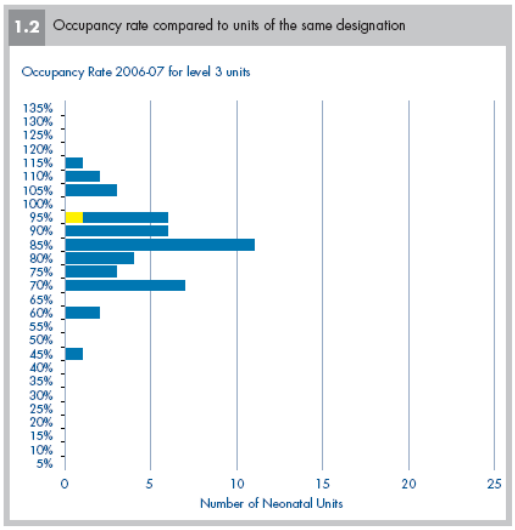
In Utero

Refusals of in-utero transfers for specialist care can happen for 2 reasons- either lack of capacity on the NICU or lack of capacity on delivery suite.
Wherever possible the cot bureau will try to locate an NICU bed for these transfers within one of the other YNN neonatal units. This equates to approximately 3 per month these may be either requested transfers into LTHT or unfortunately involve the transfer of a mother from LHTH to another unit that is able to offer the appropriate level of care for the baby. Although this is not the ideal for the mother involved it does ensure the delivery takes place in a safe environment for both mother and baby.

Investment into Maternity & neonatal nurse staffing from LTHTs 2008/9 business planning is specifically aimed at reducing refusals and effectiveness is monitored monthly through the performance review process

Comparison with national picture

The National Audit Office audited neonatal care provision in the UK in 2007. The following graphs outline how the Leeds service compares with similar units nationally. The Leeds data are outlined in yellow.



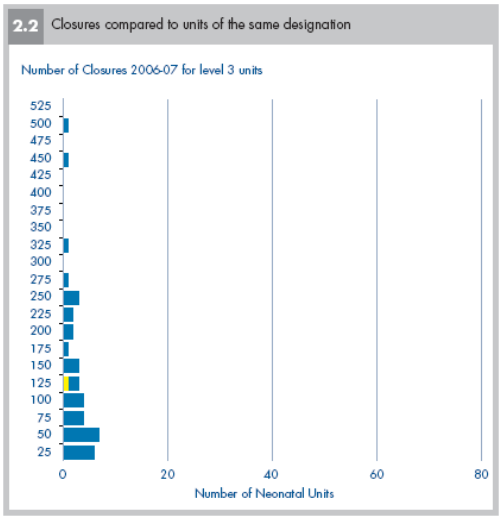


Figure 1.2 shows Leeds has a relatively high occupancy rate compared with other level 3 (tertiary) units. The recommended rate is 70%. Despite this our closure rate compares favourably to equivalent units (Fig 2.2)

Transitional Care

Transitional Care provides care to mothers and vulnerable babies together on the ward. Those babies that require special care Level 3, for example the preterm infant of 33 week gestation who is otherwise well but needs to be fed

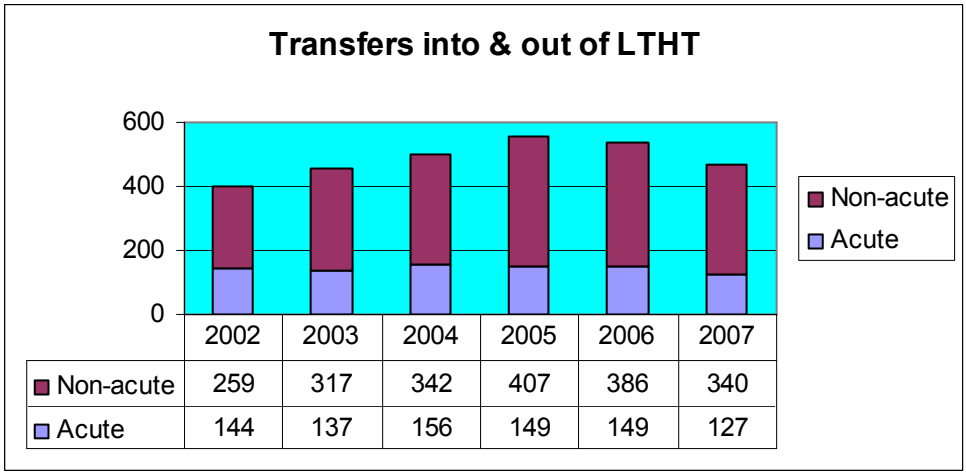
through a nasogastric tube until they are able to feed by breast or bottle. Babies whose mothers have taken substance such as drugs or alcohol during pregnancy will be admitted to Transitional care so that the baby can be closely monitored and treated alongside their mother. Babies over 33 week's gestation who may require a course of antibiotics due to infection are managed here. Transitional Care also allows the service to re admit mothers to establish breast feeding the preterm infant prior to discharge home from the Neonatal Intensive care unit.

Neonatal Transport

The Network Transport team is comprised of 9 WTE (whole time equivalents) nurses who are hosted by Leeds Teaching Hospitals but Network funded and supernumerary. The service was originally limited to acute transfers into the Leeds units for specialist care from the Network (although sometimes could be beyond these boundaries), and repatriation of these babies when the level of care they required could be delivered at their local hospital.

No funding was allocated for medical staff to support transport. If a doctor is required to accompany the baby this doctor is provided from the LTHT staffing establishment i.e. the team of doctors working on NICU. If the team of doctors are busy this can lead to an inability to retrieve babies from within the network which is estimated to be about 14 times over the last 2 years although exact numbers are not available.

The table below gives numbers of transfers undertaken both into and out of LTH over the last six years.



	2002	2003	2004	2005	2006	2007
Non-acute	259	317	342	407	386	340
Acute	144	137	156	149	149	127

In January 2008 the service provision from LTHT to the Network was increased within existing Trust resources to support the transfer of non acute patients (not ventilated) between *any* of the hospitals within the Yorkshire neonatal Network (YNN) and between YNN and hospitals and those outside the Network. This was done to maximise the efficiency of the cots within the Network and allow for earlier repatriation of all babies within the Network. This was achieved by providing core transport time between the hours of 8am and 10pm daily. An acute emergency transport services can be provided out of

hours if required. This change in service has resulted in a 36% increase in activity from January to July 2008.

Cot Bureau

The Yorkshire neonatal Cot Bureau was set up in 2002 to assist all hospitals in the YNN to locate cots with the appropriate level of care for babies. The Cot Bureau also assists the Obstetric services to locate the hospitals with the appropriate level of Neonatal Care for mothers that require transfer before giving birth.
The Cot Bureau is manned daily from 8am – 10pm. All request for cots in the Network come through the Cot bureau allowing an overview of the capacity within Yorkshire. This service also assists the Transport team with up to date information of where babies are located that may need to be transferred back to their referring unit.

Provision of Community Outreach

Neonatal Outreach

A team of five experienced neonatal nurses based cross city at both Neonatal Unit sites provide on-going support to babies and their families who require specialist nursing care when they are discharged home from hospital. Each member of the team is responsible for the management of a defined caseload and carries responsibility for the assessment of care needs, and the development, implementation and evaluation of individual programmes of care. This level of support to parents and carers allows vulnerable babies with complex needs to be discharged home safely; it reduces the length of hospital stay, and by identifying potential problems early, prevents unnecessary readmission.

The team take the lead when planning any complex discharges, i.e. babies who require home oxygen therapy, or long term nasogastric tube feeding etc. The team have also recently started to offer all parents the opportunity to learn how to safely feed their babies via a nasogastric tube, utilising this skill reduces hospital admission time, re-uniting babies with their families as soon as possible at home. In a six month trial period, on one site only, short term tube feeding at home led to a saving of 224 in-patient days.

Neonatal Outreach also run a nurse led clinic providing Palivizumab therapy to babies who are at exceptional risk from Respiratory Syncitial Virus (RSV). The success of the clinic during the last RSV season ensured that none of the high risk group of babies was readmitted into hospital with RSV [Expected admission rate 10-15% in this population]. The team also identified potential cost savings of approx £15,000 with vial sharing and this is currently being explored with the pharmacy team.

Neonatal Outreach also offer support and act as a resource for midwives and health visitors working in the community.

By offering a seven day service, covering all of Leeds, the work of the team has improved the care offered to vulnerable babies and families it has also resulted in improving the capacity of the Neonatal Units.

Surgical Outreach

The appointment of the Network Consultant Nurse supported by a Surgical Outreach service has seen a significant decrease in the length of stay of those babies receiving Neonatal Surgery in Leeds. The Team provides on going support to infants, children and their families who require surgical intervention. The team is instrumental in facilitating early discharge to home or local hospital and also educates staff in order to ensure safe continuation of care. Many of the infants we manage require complex packages of care ie; tracheostomy, stomas and specialist feeding tubes.

Establishment & budget

2005/06	2006/07	2007/2008	2008/2009
£9,071,215	£9,414,361	£9,890.877	£10,588,870

Funded Nursing Establishment Neonatal Units, Transport Team and Transitional Care

ROLE	**WTE**
Band 8A ANNP	2
Band 7 Senior Sister	25.97
Band 6 Junior Sister	36.72
Band 5 Staff Nurse	97.66
Band 4 Nursery Nurse	7.97
TOTAL	170.32

The service has undertaken a skill mix reviews to ensure resources are used to the maximum benefit of babies and their families; this has included the creation of Advanced Neonatal Practitioner Roles (ANNPs). These are two of our most highly experienced senior sisters who have undertaken further training and education and now actively function on the medical rotas. The ANNPs work alongside the medical teams supporting junior doctors and nurses in education and training while delivering advanced clinical skills.

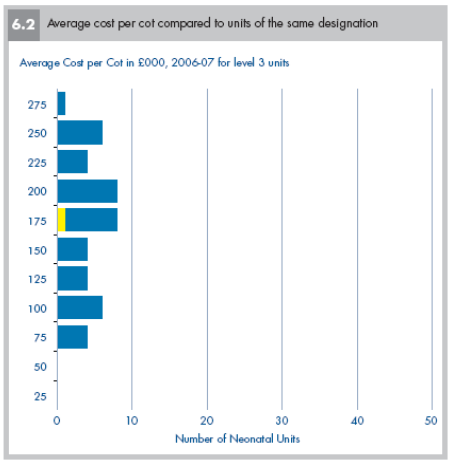
Medical Rotas:

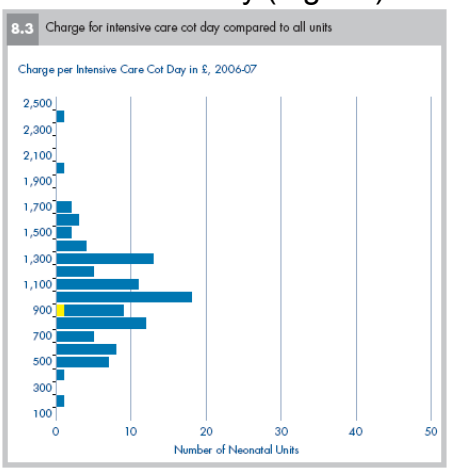
The two neonatal units within the service each have a separate medical rota of consultants and junior doctors comprising of 4 WTE consultants, 4 WTE neonatal registrars and 7-8 Senior House Officers on each unit. The Registrar rota is supported by doctors from other daytime paediatric specialties giving a total of 8 on each rota.

There is an increasing trend towards consultant delivered care as junior doctor training has reduced the experience of the resident doctors as seen by

the rota changes required to ensure Junior doctor rotas are European working time directive 2009 compliant (maximum 48 hours per week)[3]. This requires the Trust to look again at how the service is delivered and work is ongoing to define the service strategy.

Efficiency/cost
Costs per cot are similar to equivalent units nationally, though some other trusts' costs are considerably higher: (National audit office data 2007) Fig 6.2. Leeds service highlighted. The calculated charge to commissioners per intensive care day is lower in Leeds than nationally (Fig 8.3).





Role of the Leeds Service within the Network

The Leeds neonatal service operates within the framework of the Yorkshire Neonatal Network business plan, which was agreed with the trust in 2006. There are 42,000 births within the YNN region per year.

- Of the 9 NHS Trusts (12 units) with neonatal services, assuming reconfiguration of paediatric and maternity services in the future the neonatal network will consist of units based on nationally recognised classifications[i]
- 3 units classified as Level 3 Units
    - 4 units classified as Level 2 Units
    - 4 units classified as Level 1 Units

The Leeds Neonatal Service is designated as one of the three Level 3 Units with the Yorkshire Network.

The Yorkshire Neonatal Network Plan (2006)

- The national policy on the strategy for neonatal intensive care (www.dh.gov.uk) forms the framework for this plan

- Initially for all babies **under** 26 weeks gestation and those needing

[3] Training reviews (RCPCH) for the Leeds units have been very positive about the training provided to junior doctors

specialist services to receive their intensive care in one of the three level 3 neonatal services in the Network. Consideration will extend to consider whether this limit be revised over the course of the plan.

- All infants requiring neonatal care do so as close to their family home as is appropriate for their needs.

- The quality of care afforded to all patients and families within the YNN is to the highest standards of neonatal care

- Networks will not be able, nor will it always be appropriate, to deliver 100% of all NIC within its boundaries. This plan aims for at least 95% of IC for network residents will be delivered by the network.

Source: Yorkshire Neonatal Network Business Plan 2006

Changes in care pathways resulting from the YNN plan will have an effect on the capacity on the neonatal service within Leeds as some of the babies now cared for within local hospitals will be required to be transferred to the Leeds Neonatal service for initial care .The Trust are currently scoping the potential impact of this and will be working with the YNN to ensure appropriate capacity is in place and that the Leeds population are not adversely effected by these proposed changes.

Summary

- The Leeds neonatal service continues to offer an excellent specialist service to the most premature and ill newborn babies within the Yorkshire Network.
- The Leeds neonatal service runs with a high occupancy rate but uses cots flexibly to ensure it is responsive to need and has mechanisms in place to ensure any risks are appropriately managed
- On occasions tertiary referrals cannot be accepted or Leeds patients have to be transferred to another neonatal service but these are kept to a minimum and recent investment is intended to reduce this further.
- When a patient is transferred, this is almost always to another hospital within the Yorkshire network, but on a very few occasions it is to a hospital outside our network. This must be reduced and we continue to work with the YNN to minimise these occasions.
- We continue to review our service in response to local and national drivers. Service strategies are being developed with clinicians at the heart of these discussions to ensure safe and appropriate clinical models are in place.
- The service is currently working with Obstetric colleagues looking at the changes planned with the centralisation of Inpatient Children's services to ensure that a safe and responsive Neonatal service is in place as reconfiguration commences
- The YNN transport team (hosted in Leeds) provides an excellent service transferring an increasing number of babies around the region.

However this service has never been fully funded to include junior doctor cover. A joint PICU-NICU supernumerary transport team has been approved for 2009/10 by the SHA.

- The National Neonatal Task force (2008) has been jointly set up by the DH and the NHS to support Trusts in identifying and delivering real improvements to neonatal Services and will report in due course.

Circulation: Leeds Scrutiny Committee