

**Greater Manchester
Neonatal Transport Service
(GMNeTS)**

**Interim Annual Report
July 2006**

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Introduction

The Greater Manchester Neonatal Transport Service (GMNeTS) became operational on March 10th 2005, providing a network based dedicated transport team for the Greater Manchester, East Cheshire and High Peak Neonatal MCN. The transport service is based on the Neonatal Medical Unit at St Mary's Hospital but is funded by and provides a service to the whole of the Greater Manchester Network. The main functions of the transport service are:

- A Perinatal Cot Bureau service, which determines neonatal cot capacity and provides a telephone hotline service for the placement of antenatal and acute postnatal transfer requests.
- A 24/7 service for acute (unplanned) postnatal transfers across Greater Manchester
- A daytime weekday service for planned back transfers across Greater Manchester
- A prospective audit of postnatal and antenatal transfers, funded by a 2 year grant from the Greater Manchester Supradistrict Audit group.

At the outset priority was given to undertaking intensive care transfers with non-urgent back transfers undertaken wherever possible, with a view to establishing a comprehensive service within a short period. However this was constrained by difficulties in nursing recruitment, which have gradually resolved. Therefore whilst the aim was to undertake 100% of the transfers needing intensive care, the following aspects could not be guaranteed initially but remained future aspirations:

- Long distance transfers outside of the NW region
- Ability to undertake all planned transfers including those for timed appointments
- A rapid response service to level 1 units to attend the delivery or assist early in the stabilisation phase for high risk infants

Over recent months staffing has improved and by September 2006 the team should have completed recruitment to the level of the agreed business case. It is therefore intended to offer at this stage a comprehensive back transfer service, including long distance transfers. The service will also aim to undertake timed appointments and a rapid response for level 1 units where possible. A service review is required after 2 years of service (March 2007) to determine if an expansion in staff numbers is required to support these additional activities and future reconfiguration of the network.

Staffing

The original planned structure of the nursing team consisted of a Lead Nurse, the development of a team of 4 ANNPs and a larger cohort of transport nurses mainly at E grade to undertake mainly back transfers. In practice appointment to the more junior nursing grades proved difficult and therefore more experienced staff were appointed at F grade with several G grade Clinical Nurse Specialists taking on specific roles in Education, Clinical Governance and Risk Management.

As these senior staff were experienced in day to day management on NICU, when a vacancy arose for the Lead Nurse, this role was altered to that of the Transport ANNP team leader, providing a nursing lead but with greater clinical commitments. Vivianne Hall has been appointed to this position since June 2006. At present the ANNP team consists of 2 other qualified permanent ANNPs, with a 4th ANNP currently in training.

In addition to the permanent appointments, several staff have undertaken temporary secondments to the transport service including a recently qualified ANNP from Blackburn. With the appointment of 2WTE additional transport nurses, commencing September 2006, the nursing team will be fully established, and although secondments are still possible, these can no longer be funded from the transport service.

Several major developments have also occurred with Medical Staffing – Dr Ian Dady was appointed as Clinical Lead for the Transport Service in September 2005, providing 5 Programmed Activities of Consultant time to manage the transport service. Initial attempts to recruit a dedicated transport fellow at middle grade proved unsuccessful and instead the funding was used towards establishing a separate 24/7 middle grade rota for transport (previously dedicated during daytime only). This has undoubtedly assisted the ability of the service to respond rapidly to transfer requests during the night by having an additional registrar on call from home on a 24 hour partial shift.

The administrative staff within the cot bureau (currently 2.6WTE, including 0.6WTE funded by Lancashire and South Cumbria MCN) provide dedicated cover between 0800 and 2100 Monday to Friday and until 1500 at weekends. Outside these times the hotline is manned by the transport nurses unless they are engaged in a transfer, when it is covered by the Nurse in charge of the neonatal unit. It has recently been agreed that the community midwifery switchboard staff will take on the role of the cot bureau at night in the future.

The current establishment of the transport team is:

Post	Current WTE	Projected WTE
Transport Clinical Lead	0.5	0.5
Clinical Fellow	1.0	1.0
Transport ANNP team leader	1.0	1.0
Transport ANNP	2	3
Trainee ANNP	1	0
Band 7 Clinical Nurse Specialist	2.7	2.7
Band 6 Transport Nurse	2.5	4.2
Band 5 Transport Nurse	0	0.5
Band 2/3 Cot bureau coordinators	2.6	2.6

Activity

The predicted level of postnatal transfer activity prior to starting GMNeTS was extrapolated from the NW Neonatal Transport Survey 2000. The predictions were based on a projected 30% increase for acute transfers and 10% for planned transfers since 2000. No robust data were available for antenatal transfers but a ratio of approximately 2 antenatal : 1 acute postnatal transfer was deduced from the Survey data in 2000.

240 acute (unplanned) postnatal transfers were undertaken by GMNeTS in the 12 months beginning March 2005 compared to a predicted level of 260. The majority of these patients required intensive care and the reasons for transfer are seen in figure 1. Over 95% of acute transfers were undertaken by GMNeTS. There were 388 planned transfers performed by GMNeTS (predicted 450) of which 347 were back transfers and the remainder were for timed appointments.

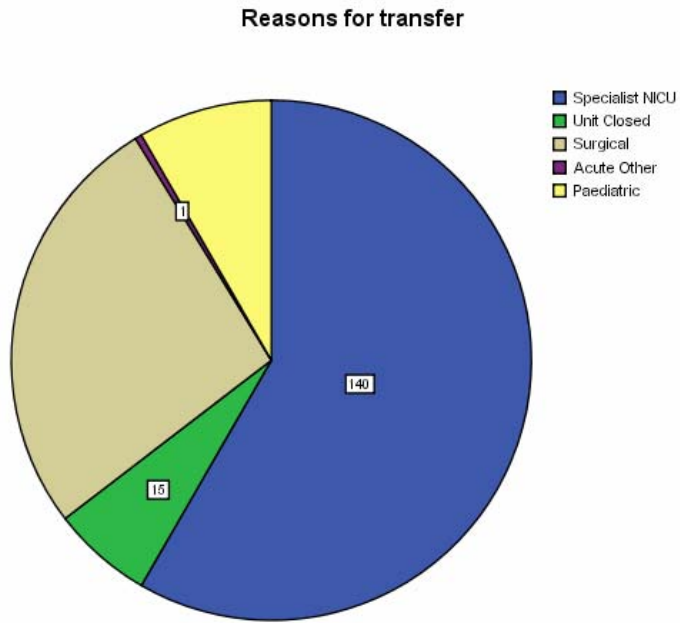
A small proportion of back transfer activity was undertaken by the local neonatal units, including a number of CPAP transfers by Hope Hospital, which was completing a research study in this field. The total number of planned transfers undertaken by local units rather than GMNeTS cannot be easily verified, as many units do not complete an audit form or amend the admission register if an infant is transferred for an outpatient appointment but returns to the local hospital. This information will be vital for workforce planning, to ensure that a comprehensive planned transfer service can be achieved in the future.

Over the same 12 month period there were 345 requests for antenatal transfer of which 290 were successfully arranged and completed. There were 55 referrals which did not proceed following obstetric discussion at consultant level – these were usually deemed inappropriate for clinical reasons. The number of antenatal transfers per thousand births was 8.2, giving a ratio of antenatal to acute postnatal transfers of 1.2 : 1. This appears to have decreased since 2000, and may reflect increasing difficulties with maternity capacity in the network, a more conservative approach to requesting antenatal transfer or greater ease of arranging a postnatal transfer. Certainly almost all women undergoing antenatal transfer were at a very early stage of labour with only 3 women with a cervical dilatation of more than 3 cm.

The overall rate of postnatal transfer undertaken by GMNeTS (18 / 1000 births) remained similar to that recorded in 2000 (20 per thousand) which is considerably higher than has been published elsewhere in the UK (approx 10-12 per thousand in SE England and London).

Overall the Greater Manchester MCN remains a net “importer” of both antenatal and acute postnatal transfers. There were 27 antenatal transfers out of Greater Manchester, mainly but not exclusively because of insufficient maternity capacity, with 65 incoming antenatal transfers of which the majority were from Lancashire and South Cumbria. There were 48 incoming acute postnatal transfers (32 from Lancashire and South Cumbria) and 38 outgoing acute transfers from Greater Manchester. Of these 38 outgoing transfers, 28 were for specialist Cardiac Surgical care at Alder Hey or Birmingham. The remaining 10 transfers were due to lack of Neonatal Intensive care capacity (2 to Lancashire, 4 to Liverpool and 4 to Yorkshire / Trent).

Figure 1. Reasons for acute postnatal transfer



Finance

The funding for GMNeTS was identified originally from network monies provided centrally by the Department of Health specifically to support neonatal intensive care. The budget was agreed within the business case by the Greater Manchester Neonatal MCN board, Greater Manchester SHA and Central Manchester PCT who held the money on behalf of the network.

Initially a partial transport service was agreed to commence in 2004/05 with a total budget of 291K. As implementation of the service did not commence until March 2005, revenue expenditure for this financial year was low (38K) which was invoiced to Central PCT. A total of 118 K capital was approved for 2004/05 and 2005/06 to purchase additional transport equipment, which has been fully utilised.

After discussion with Central PCT the revenue budget for transport for 2005/06 and 2006/7 (including non-pay costs) was agreed at 573K. In view of initial difficulties with recruitment, significant slippages on staff costs were noted and consequently the transport service costs (based at CMMC) were invoiced to Central PCT at a projected level of 460K.

During the latter half of 2005/6, recruitment significantly improved and with the team anticipated to be fully staffed in September 2006, the projected expenditure for 2006/7 will be close to the allocated budget of 573K. Notably, this budget allocated to transport has not been uplifted to allow for inflationary pay awards, incremental drift or Agenda for Change. The CMMC Acute Trust is therefore assuming that these pay awards will be funded in full within the 2006/07 Neonatal Transport allocation. A financial review is also required in early 2007 to ensure adequate resources are available in the future to facilitate any expansion of the service alongside network reconfiguration.

The year end financial position for 2005/6 is detailed below:

Financial Summary 2005/6

Greater Manchester Neonatal Transport Service

Cumulative Spend	£
Pay	
Consultant	42,300
Clinical Fellow	57,142
Total Medical Staffing	99,442
ANNP Lead	47,976
ANNP's	51,573
Total ANNP Staffing	99,549
Nurse Grades G-E (Band 6/7)	205,562
Total Nurse Staffing	205,562
Administrative and Clerical Staff	26,530
Total A&C Staffing	26,530
Total Pay	431,083
Total Non Pay	12,762
<u>Total Revenue Expenditure</u>	<u>443,845</u>
*Capital Allocation	118,000
<u>Capital Spend</u>	<u>118,000</u>

***Capital**

The Capital allocation has funded the purchase of 2 Transport incubators, 12 infusion pumps, 1 monitor and other essential items for the efficient running of the service.

Clinical Governance

A number of aspects of clinical governance have been developed within GMNeTS including:

A monthly multi-disciplinary education and training session for medical, nursing, ANNP, clerical and technical staff. A variety of topics and learning methods are covered including case presentations, formal lectures, interactive case scenarios, troubleshooting and demonstrations of equipment. These meetings are organised by 2 of the Clinical Nurse Specialists.

All medical staff undergo a full day of training and orientation to the transport service and are accompanied by the Clinical Lead before they undertake "solo" transfers. New Nursing and ANNP staff also receive an induction to the transport service and assessment of competencies.

The ANNP staff within the transport service are currently allocated 30% of their duties to consolidating their clinical skills in Neonatal Intensive Care in addition to gaining further experience in Transport. They are allocated a Consultant Mentor and meet regularly to discuss progress and experience. Their level of experience and competence is documented using a structured proforma.

A robust risk management system has been developed with quarterly meetings chaired by two of the clinical nurse specialists. These meetings are open to all the transport team and Cot Bureau but representatives from other tertiary and DGH nursing and medical staff are invited, together with the Greater Manchester Ambulance Service. Adverse incidents are reported by either transport staff or other clinical staff from across the network using a report form which can be downloaded from the GMNeTS website. These are then investigated and discussed at the risk management meeting and recommendations cascaded to the transport team.

A clinical practice group has also recently been developed which identifies areas in need of a new or amended guideline. These are also discussed at a quarterly meeting and team members are identified who will be responsible for developing the guideline. These guidelines will soon be available on the GMNeTS website.

A prospective audit of both antenatal and postnatal transfers was commenced at the onset of the transport service in March 2005, facilitated by a Transport Audit Coordinator (Catherine Kay). The development and piloting of the audit commenced in October 2004, the project became live in March 2005 with the aim of completing 12 months data, before the final report was produced.

This post was funded by the Greater Manchester Supradistrict Audit Group for a fixed period of 2 years however unfortunately a bid for an extension to the audit was subsequently declined. The audit coordinator post became vacant in May 2006 and whilst the data collection is continuing as an ongoing audit, it is likely that the quality of audit returns and validation of the data will deteriorate.

The interim results of the antenatal and postnatal transfer audit was presented at the recent UK Neonatal Transport Special Interest Group inaugural meeting, which was hosted by GMNeTS in Manchester. The abstracts of the antenatal and postnatal transport audit are appended to this report.

A Clinical Governance Forum was established in September 2005, which should provide a means by which representatives from the various stakeholders within the network can discuss issues relating to the transport service. A further meeting has been arranged by the Chair of the Forum, Dr Mahesh Yadav, and is scheduled for September 2006.

A series of “road shows” to each unit was undertaken prior to implementing the transport team and this will be repeated in the autumn of 2006. The aim of these meetings will be to update staff about the role of the team, allow feedback, discuss potential developments and provide an educational opportunity relating to pre-transport stabilisation. Information about the service for both parents and professionals is available on the GMNeTS website and via a transport service newsletter sent to all units in Greater Manchester.

Audit and Research

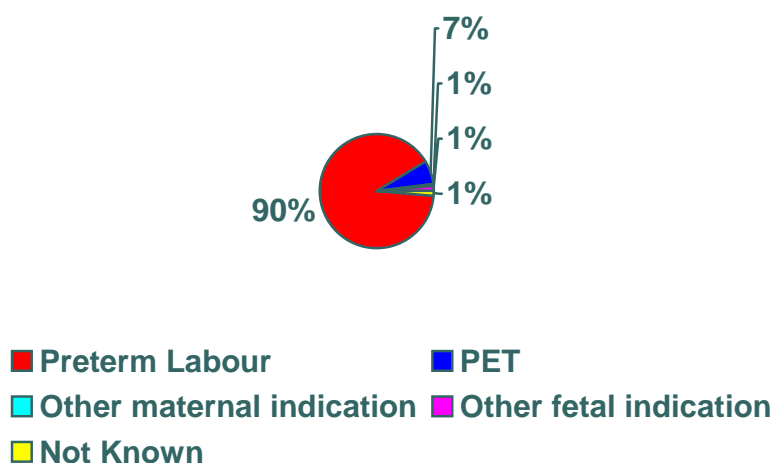
The transport service has contributed to the ongoing prospective audit of antenatal transfers arranged by the NW perinatal Cot Bureau and postnatal transfers undertaken by GMNeTS. The main findings of this audit are presented below. In addition 2 other projects have been initiated – a survey of ambulance response times and a pilot study evaluating the validity of end tidal CO₂ measurements during transfer. The latter was undertaken by Louise Pyke, as part of her 4th year medical student options project.

Audit of Antenatal Transfers

The reasons for requesting an antenatal transfer are displayed below – the vast majority of these were for threatened or actual preterm labour (fig 2).

Figure 2 Reason for requesting antenatal transfer

N= 345



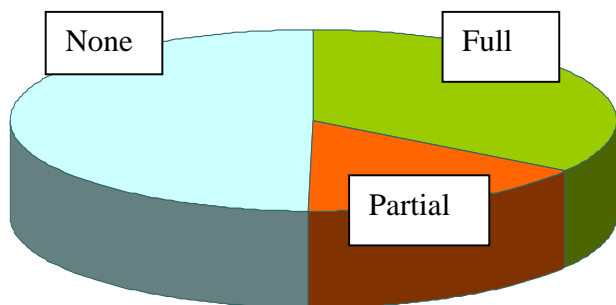
Most of the women for whom transfer was requested were threatening to go into preterm labour rather than being in established labour. Of 345 requests, only 98 were contracting regularly and just 3 of these women had a cervical dilatation of more than 3 cm. Although most women were clearly in the very early stages of labour, one woman was 8 cm dilated at transfer with frequent contractions and delivered within 30 minutes of arrival at the receiving hospital. There were no antenatal transfers which resulted in delivery in transit or other instances of delivery within 1 hour of arrival.

In conclusion, most women were transferred who were at risk of or in the very early stages of preterm labour and these cases were managed safely. There were 55 women who were referred for transfer which did not proceed after a discussion between the obstetric consultants and arguably this intervention prevented inappropriate transfer requests from proceeding. A recent request has been made by some Obstetricians to change the policy on case discussion so that the referring registrar contacts the receiving consultant. It will be interesting to see what effect this will have on the number and appropriateness of antenatal transfers in the future.

Despite the large numbers of women undergoing antenatal transfer the use of steroids and tocolytics at the point of referral was low (figure 3).

Figure 3 Use of antenatal steroids

N = 183



Approximately half of all women undergoing antenatal transfer had not received any steroids at the point of referral and only one third had completed a course of steroids. Despite this many women who were in established preterm labour and had not completed a steroid course, had not received tocolytics. This suggests that steroid therapy may be delayed in many women until they arrive at the receiving unit and that greater use of tocolysis might be used to delay delivery until steroids have been completed. The findings were similar for women with PET, in whom half had not received steroids at the point of referral.

Audit of Postnatal Transfers

240 acute postnatal transfers were undertaken with a mean gestation of 31 weeks and birth weight of 1900g. These demographic statistics show a reduction of approximately 1 week gestation and 100g weight compared to the NW Neonatal Transport Survey 2000. Approximately two thirds of transfers required ventilatory support compared with 54 % previously.

The total number of all transfers per day ranged between zero and 6 with a median of 2 transfers per day. On 67 days in the year there were no transfers of any type. The maximum number of acute transfers per day was 4 which occurred on two occasions, however there were 188 days when no acute transfers occurred demonstrating the cluster effect which is well recognised by the transport team.

The availability of a dedicated transport service and differing case mix compared to 2000 has altered the composition of the transport team staffing. Compared to 2000 there was a higher number of occasions when the registrar was required to attend an acute transfer (80 % vs 54%). The number of ANNP led acute transfers was low during the study period but had increased compared to 2000 (6% vs 0.4%). This number has steadily increased as the experience and numbers of qualified ANNP staff built up during the year and currently stands at around 25%.

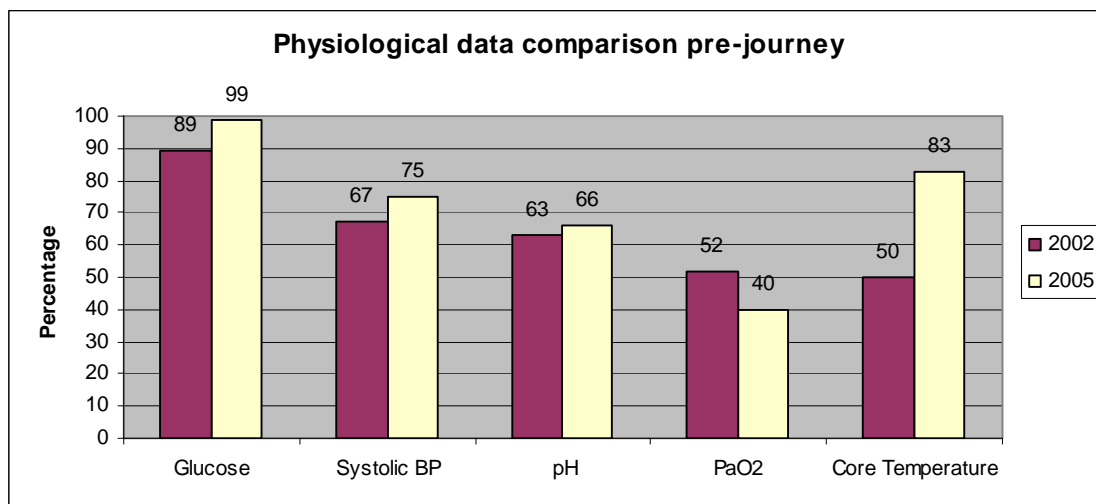
The postnatal audit also examined the speed of response of the transport service for acute transfers. The mean time to locate a neonatal intensive care cot was 31 minutes, demonstrating the success of the cot bureau. The despatch time (from location of cot to despatching the team) however was higher than previously (135 vs 100 minutes).

There are two main explanations for this – firstly until autumn 2005 there was no dedicated SPR available for transport at night. Since then a separate 24/7 partial shift has been developed with the registrar being on call from home overnight. As one might expect the introduction of a dedicated team has increased the access generally for transport across the 24 hour period, with more acute transfers out of hours compared to 2000. Over the study period, approximately 15 % of transfers were commenced between the hours of midnight and 0800.

Secondly there have been significant delays on many occasions due to unavailability of an ambulance crew. This was particularly evident during the winter months when the majority of requests fell outside the service level agreement of 30 minutes for GMAS to respond. The transport service has been working with GMAS to attempt to resolve some of these issues and hope to develop an innovative collaborative approach to solving this issue (see below).

It is interesting to note however that the use of a dedicated team did decrease the time required to stabilise and prepare the infant for transfer (93 vs 111 minutes). This was not achieved at the expense of physiological instability in fact the percentage of transfers reaching the required standards was generally improved compared to 2000, particularly for temperature control (figure 4). A comparison of measurements before and after transfer showed that these values were maintained throughout the transfer.

Figure 4



Although it is difficult to audit travel time accurately for parents, two thirds of the transfers were to a hospital less than 20 miles from the referring unit and a further 10 percent were under 30 miles. This would suggest that in the majority it was possible to travel to the hospital within 30 minutes off peak and in a proportion of the remainder there were good clinical reasons for longer distance transfers (eg for Specialist services such as Cardiac Surgery).

Developments

A number of developments have occurred since the inception of the transport team and are planned for the future. These include:

Transport team staffing

The transport team will reach maximum staffing within the allocated budget in September 2006, with the appointment of an additional 2WTE transport nurses. This should enable a comprehensive back transfer service in addition to the acute retrievals. However due to various financial factors including incremental drift, Agenda for change etc, the establishment will remain at least 1WTE below that agreed in the original business case. This may limit the services ability to undertake transfers for timed appointments or the development of a rapid response team for level 1 units, which were the final phase of development.

There are currently 3 qualified ANNPs working on the transport team, two of whom have over 12 months experience and the other recently qualified. A 4th ANNP is currently in training and should qualify in April 2007. The ANNPs are currently undertaking most acute transfers that do not require intensive care and an increasing proportion of the stable cases that require ventilation or intensive care. This proportion will increase as their experience and numbers grow but it will require additional funding in order to provide a fully ANNP led service in the future.

There are currently 2.6 WTE cot bureau staff providing approximately 80 hours of dedicated cover per week for Greater Manchester and Lancashire / South Cumbria. There is a planned development for this to be extended to 24 hour cover with the assistance of the radio room staff within St Marys who currently coordinate the community midwifery service at night for Manchester.

Equipment

The transport service has instigated the use of end-tidal CO₂ monitoring for ventilated patients to provide an early warning of ET tube displacement or occlusion during transfer. This has been evaluated in an initial pilot study and a larger research project is planned.

Plans are also well advanced for the introduction of inhaled Nitric Oxide during transfer and this development is anticipated within the near future.

Ambulance Service

In response to a the difficulties faced by Greater Manchester Ambulance Service in providing a satisfactory response time for the transport service, a variety of innovative approaches have been considered. At present the most beneficial option is to consider a dedicated transport service car, which can take the staff plus portable equipment to the referring hospital immediately a referral is made for an acute transfer. This vehicle would be driven by the transport team and the ambulance staff would attend St Marys to collect the transport incubator at a later stage.

Another alternative would be for the transport service to purchase and modify a small van instead of a car which could also carry the transport incubator to the referring hospital. This would mean that the ambulance staff would need to attend at the point when the patient was stabilised and ready for transfer within the incubator. Clearly both options would require both capital and revenue expenditure and a detailed option appraisal and business case is in progress.

Other neonatal transport services

Currently GMNeTS undertakes a number of acute transfers from referring units in Lancashire and South Cumbria either for reasons of capacity or need for specialist services. The funding arrangements for this historical activity are currently under consideration. However Lancashire and South Cumbria Neonatal MCN have developed a plan to commence a neonatal transport service based at Blackburn and Preston Hospitals.

This will be a weekday service only between 0800 and late afternoon with a planned start date in September 2006. Alongside this development will be an increase in intensive care cots in both units. GMNeTS will continue to undertake all transfers into level 3 or tertiary units within Greater Manchester (and all babies needing urgent transfer out of hours) however the Lancashire team may undertake transfers of more mature infants and back transfers as required.

Mersey and Cheshire have appointed a consultant nurse (Carol Jackson) to lead the development of a network based transport team for their network. At present this service remains in the planning / business case phase however it is hoped a decision will be made by the commissioners in the near future.

Elsewhere in the UK dedicated transport services are evolving at various speeds and in different ways to suit the needs of the local population. GMNeTS recently hosted the inaugural meeting of the UK Neonatal Transport Special Interest Group in Manchester, which will aim to share good practice and develop national standards and guidelines where appropriate for the benefit of all transport services.

Conclusions

The first year of the transport service has proved successful overall despite some occasional teething problems and very busy periods. I am grateful for the support of the clinicians within the network and constructive feedback has helped us to improve service during this time. A full annual report and audit report will be published in due course, however if you have any further comments or suggestion then please do not hesitate to contact me.

Dr Ian Dady

Clinical Lead, GMNeTS

July 2006