A day in the life of a neonatal transport sister in the west of Scotland

The West of Scotland Neonatal Transport Team, or NETS as it is known, has been in operation since January 2003 and forms part of the National Newborn Transport Service for Scotland. In this article, the authors present three very different case studies to give an idea of a typical day working for a regional transport team.

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Key points

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1. The West of Scotland Neonatal Transport Team (NETS) provides cover 24 hours a day, seven days a week for all elective and emergency transfers in the West of Scotland.
2. It is a new, specialised, multidisciplinary service, still in the process of developing.
3. The team retrieves infants requiring ECMO suppport from anywhere in the UK back to Glasgow, one of only four centres in the UK providing this service.
4. One in four transfers are emergency transfers.
5. NETS has the only designated air kit in Scotland.

The remit of the West of Scotland Neonatal Transport team is to cover all neonatal transfers in the west of Scotland whether they are emergency or elective (75% of all transfers). Elective transfers may involve back-to-base moves, appointments at clinics, or routine investigations like magnetic resonance imaging (MRI) scans or electro-encephalograms (EEG). On average we transfer 800 babies a year.

Emergency transfers account for approximately 25% of our workload. Glasgow is one of the four centres in the UK providing an extracorporeal life support (ECMO) service for the newborn and as such we are prepared to go anywhere in the UK to retrieve a sick infant requiring such support. This necessitates the air certification of our incubator system, a lengthy and expensive process allowing us to utilise specific fixed and rotary wing aircraft.

The team consists of a neonatal transport co-ordinator, two neonatal consultants and three full-time neonatal transport fellows with additional cover from two neonatal specialist registrars. There are also three full-time neonatal transport nurses and a cohort of neonatal transport bank nurses. In addition, we have the services of a full-time medical physics technician and secretarial support. The Scottish Ambulance Service provides drivers for our two dedicated vehicles.

The team provides cover twenty-four hours a day, seven days a week. The permanent neonatal transport sisters cover day shifts while night shifts are covered by a number of appropriately trained bank staff. A senior, who may be the consultant or neonatal transport co-ordinator, covers all shifts and is contacted when logistical advice is required.

Of the three neonatal transport sisters, one of us has completed ANNP training, with the remaining two embarking on the ANNP course next year. Our day begins at 8am in our recently refurbished transport offices, when the equipment is checked and made ready for any arranged transfers.

We have chosen to describe three different transfers to demonstrate a fairly typical day.

Case one

This involves the transfer of a baby for routine investigations, for example MRI or EEG. It is our responsibility to inform the referral unit when leaving the transport room and give an estimated time of arrival to collect the baby. We ensure paperwork is to hand and fill in any details we are given.

On arrival at the referral unit, we acquaint ourselves with the staff and particularly the midwife who is looking after the infant. We clinically assess the infant and organise any special requirement the baby may have, e.g. oxygen or intravenous fluids. If possible, we introduce ourselves to the parents and explain the service which we will be providing.

The incubator is prepared to function at the level indicated by the clinical requirements of the infant. All babies transferred in an incubator are monitored with a SaO_2 probe and a temperature probe at least.

When everything is ready, we transfer the infant from the hospital incubator to transport incubator as quickly and efficiently as possible, attach all relevant probes and security straps and settle the baby. If the baby has a small soft toy we place that alongside. We are always aware of developmental care and strive to continue the same during our transfers.

Once our paperwork is complete,

observations for the transfer are started and we prepare to leave the unit. At this point we endeavour to inform the receiving unit that we are ready to depart and estimate a time for arrival. We try to adhere to appointment times as much as possible.

For any routine investigations at the receiving unit we would always ask the referring unit for a nurse escort. This allows the baby to be accompanied at all times during investigations. The transport team cannot stay with the baby as they may have other transfers to carry out or may be called away to an emergency.

Once the investigations have been completed the transport team will be notified and will return to transport the baby back to the base hospital.

Case two

Baby C was an ex-26 week baby who at 46 days old had undergone a surgical procedure for central line insertion. This had been necessary because of the baby's chronic lung disease and poor growth pattern. She had not beeen tolerating her milk feeds and it was very difficult to gain peripheral intravenous access. She had recovered from the procedure and was ready to be transferred back to base.

The neonatal transport team were called, updated on her present condition and asked to undertake the transfer. As she remained ventilated, a doctor was required for the transfer. On arrival at the unit we found a very stable baby. Her ventilation requirements were minimal. We transferred her to the transport incubator, set up her fluids, checked her sedation was adequate for the journey and rechecked a capillary blood gas prior to departure. We were satisfied that she was stable enough and set off on our journey which would take around 40 minutes.

After only approximately 10 minutes on the road there was an unusually loud noise like fireworks exploding. We immediately stopped the ambulance and the doctor continued to closely monitor the baby while the other team member tried to troubleshoot the source of the noise. On putting a hand down the back of the incubator the oxygen and air hoses were found to be extremely hot and seemed to be melting. We immediately stopped mechanical ventilation and supported the infant's breathing by hand bagging her with our auxillary oxygen supply.

We were at least 30 minutes from our destination and realised it was very impractical to hand ventilate her all the way there. However, we were only five minutes from our own NETS base, so we decided to go there to get a new incubator and equipment. Rather than transfer the baby to a new incubator, which would have been quite an ordeal for the baby and would have necessitated stabilising her again before the transfer could recommence, we were able to fit new hoses to the ambulance ventilator. We managed this fairly quickly and once everything was checked and working properly we were able to reconnect the baby to the ventilator and continue our journey without any further problems.

TOP: The transport team overseas the loading of a baby into a Royal Air Force rescue helicopter.

ABOVE: Janice Jack and Dr Annie Robertson help load an incubator into the Beechcraft King Air.

Case three

The transport co-ordinator received a call requesting the air transfer of a term baby from a small highland hospital some 170 miles distant. The history, clinical examination and echocardiograph suggested a diagnosis of transposition of the great arteries. On advice from the cardiologist at the receiving hospital, prostaglandin had been commenced to maintain the patency of the arterial duct. At the age of 13 hours ventilation was commenced by the referring hospital because of the risk of apnoea during the transfer due to the use of prostaglandin. Inclement weather conditions meant that the MoD Sea King helicopter was tasked with undertaking both outward and inbound legs of the transfer.

On departure to the referring hospital it had started to snow heavily and by the time the team reached the referring hospital visibility was very poor. The helicopter went to a local military air base to wait while the baby was stabilised. The team's initial examination and assessment indicated that the infant was deteriorating despite full and appropriate medical support, indicating the need for an urgent atrial septostomy procedure. Full preparation according to transport protocols was undertaken and the infant was made ready for the journey to Glasgow. In the meantime, the weather had deteriorated and the assessment by the Search and Rescue Centre was that further flight was not possible. The baby was transferred

Annmarie Wilson (Co-ordinator) and Carol McAra accompany one of their charges in the EC135 helicopter.

back to the unit incubator and initial ventilator but remained on the team's infusion pumps to allow a rapid transfer should there be a window of opportunity to fly. The transport co-ordinator and consultant were contacted and asked to look at alternative methods of getting the baby to the receiving unit. Back at our base alternatives were being discussed.

Roads were impassable because of snow and multiple accidents, rail travel was considered but deemed not possible, because there was no gas supply for the ventilator and no means of securing the incubator. The transport consultant contacted the receiving cardiologist and after some discussion suggested that since the team could not get this baby to the cardiologist, the only alternative was to take the unusual route of getting the cardiologist to the baby. Scotrail were contacted and with the help of the police, the cardiologist, complete with his equipment, travelled by train to the referring hospital. Once there he carried out a further ECHO confirming transposition of the great vessels and a balloon septosomy was performed, with a marked improvement in the infant's condition.

The following morning, the weather had improved enough to fly. The flight was uneventful and the baby arrived in the cardiology ward in a stable condition. The total duration of the transfer was 23 hours, but with good team management the outcome was a stable baby who went on to make good progress.

Discussion

As can be seen from these case studies, our days can be very diverse. The cases described illustrate how varied the clinical role of a transport sister can be. However, transfers are only a small part of our role and a lot of other activities have to be taken into consideration.

To become competent in neonatal transport there are a lot of hurdles to overcome. Patricia Benner's *Novice to Expert* teaching is a very accurate account of the path that has to be followed. Although we all have vast experience of neonatal nursing in a unit setting, applying this to neonatal transport is very challenging. We begin at novice level again as we have to learn about a whole new range of transport specific equipment and scenarios. We have to cope on a daily basis with situations on the road or in the air which are totally different to those posed in a neonatal unit. We have to learn to troubleshoot very quickly and improvise on everyday experiences. We are often on our own and have to make a lot of important independent decisions without the added knowledge or expertise of other colleagues, and this can lead to strong feelings of isolation. As this is a fairly new role in Scotland, it has had to be developed and adapted to the variety of activities presented in a transport environment. It is also very important to ensure that the role evolves in line with service development.

Service development is a very large part of the role. It is important to forward plan, in addition to keeping up-to-date at all times with changes in clinical situations and practice. Ventilation strategies are continuously evolving and to allow the service to transport babies with the same standards of care as the neonatal units, we have to develop strategies to keep abreast and ensure we can replicate these practices during transport. The need for continuing education and the updating of staff involved in the transport team is therefore of paramount importance. This makes it vital to have a role in training and education.

Education involves many different areas and relies on good team work. At present both medical, nursing and medical physics personnel join us to learn about and experience neonatal transport first hand. The dedicated medical physics technician accompanies us on occasion to experience the equipment working in a real transport situation. There is involvement in outreach training which involves site visits to assess the facilities that exist for resuscitation and stabilisation prior to transport, often in very remote and rural areas. This allows planning for necessary clinical updates and arrangements to be put in place appropriate to the needs of each individual unit. The creation of a pre-transport and stabilisation course has facilitated these aims, setting objectives and goals and therefore promoting good educational practice. Research and audit constitutes another large part of the role. At present there are several on-going research projects, one of which is investigating the effects of noise on the neonate during road and air transfers, looking at the effect on several different physiological parameters.

Conclusions

As the outline of the role demonstrates, we are part of a unique multidisciplinary team. The role of each member of the team is dependant on other team members. To allow us to function efficiently, good communication and team support are essential. We are fortunate to be part of this new and developing service, that allows us to grow as clinicians and educators whilst providing us with the opportunity to improve current practices.

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