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Nursing the surgical neonate part 1: developing a neonatal surgical outreach service

In 2007 it was reported by 23 of the 26 UK centres providing paediatric surgery for neonates that all but one had refused admissions due to lack of capacity.[1] In the last decade, Birmingham Children's Hospital has addressed this problem by developing a neonatal surgical outreach service. This article describes the concept behind the outreach service and how it was developed.

Bernadette Reda
RGN, RSCN, ENB405
Lead Nurse, Neonatal Surgical Outreach Service, Neonatal Surgical Ward, Birmingham Women's and Children's NHS Foundation Trust
b.reda@nhs.net

Keywords

neonatal surgical outreach service; neonatal surgery

Key points

Reda B. Nursing the surgical neonate part 1: developing a neonatal surgical outreach service. *Infant* 2018; 14(1): 25-29.

1. There had been a long-standing capacity issue at the West Midlands regional neonatal surgical service.
2. The Birmingham Children's Hospital paediatric surgical unit is not co-located with maternity and neonatal services.
3. Birmingham Children's Hospital collaborated with established managed clinical networks to develop a programme of training and education to support an outreach service.
4. Data collection and analysis was initiated to inform further service development.

Background

In 2009 almost all UK hospitals providing neonatal surgery were refusing 10-20% of admissions with one centre refusing up to 50% of referrals due to a lack of capacity.[1] Birmingham Children's Hospital (which has now merged with Birmingham Women's Hospital to form Birmingham Women's and Children's NHS Foundation Trust) is the designated surgical centre for two West Midlands Neonatal Operational Delivery Networks with an annual birth rate in excess of 50,000.[2] Data gathered in the West Midlands region suggested that between 50 and 100 babies a year went out of region for their surgery. Long distance transfer of fragile infants and separation of newly delivered mothers from their baby posed a challenge for the region. Families split geographically for surgical care and subsequent delay in repatriation due to lack of suitable neonatal surgical cots happened frequently, resulting in separation from the usual support networks. Insufficient physical space limited the availability of surgical cots for what is predominantly an emergency service. In addition, protracted lengths of stay for complex patients decrease the number of cots available at any one time for emergency admissions. A bold strategy was needed to provide the necessary capacity.

It is noteworthy that there are economic implications for the organisation as well as the families, in addition to clinical risks when moving sick babies large distances across the country. A further observation is that after surgery many neonates require medical neonatal specialist input and are best cared for in a medical neonatal unit rather than a paediatric intensive care unit or surgical ward (**FIGURE 1**).

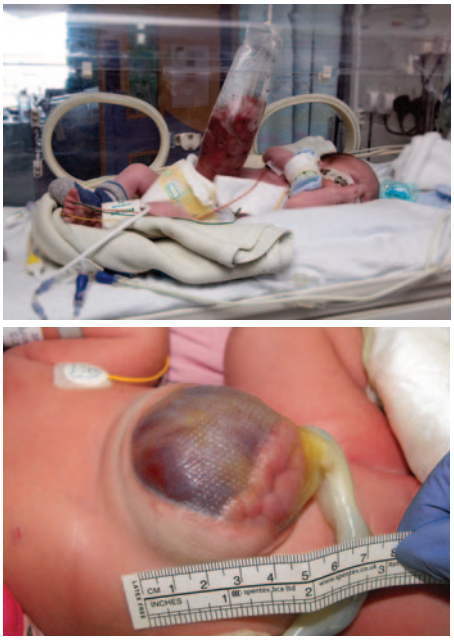

FIGURE 1 Examples of congenital conditions requiring surgical repair and nursing care. Top: staged repair for a baby with gastroschisis. Bottom: a baby with exomphalos major on the day of birth.

The 2008 Department of Health report *Commissioning Safe and Sustainable Specialised Paediatric Services*[3] and the survey of facilities of neonatal surgery in the UK by Burge in 2007[1] confirmed the thoughts of healthcare professionals and commissioners at that time. In 2007, after a period of consultation, a service specification was developed by the West Midlands Specialised Commissioning Team in response to the ongoing pressures on the capacity for babies needing

paediatric surgery in the neonatal period, concerns over delays in treatment and the number of babies having to travel outside the West Midlands for surgery. There was recognition that these issues resulted in longer transfers for sick neonates at their most vulnerable and longer travelling times for their families. The principles of the specification were drawn up by a working group comprising members of the commissioning team, the local neonatal networks and parent representatives, and views were sought from local stakeholders through a scoping exercise. It was agreed that the neonatal surgery service should work according to a number of principles, some of which are listed here:

- uphold the philosophy of care of the local neonatal networks
- adopt a holistic, multidisciplinary model of care involving neonatal and intensive care expertise
- care without delay, where mother and baby are together wherever possible and as close to home as possible
- configuration of services to ensure appropriate continuity of care.

It was acknowledged that for some families other surgical centres outside the region may be more convenient for their home address and this was taken into account when developing the care pathways.

During the development of the service specification it was agreed, and has since been endorsed, that an ideal service would have the neonatal surgical service located on the same hospital site as the fetal medicine service, maternity services, neonatal intensive care unit (NICU) and other specialist paediatric services.[4,5] The historical configuration of services in Birmingham does not allow this and until this can be addressed, in order to work according to the principles outlined above, the Birmingham Children's Hospital Neonatal Surgical Outreach Service was commissioned to help manage the care pathway for these patients and families. To strengthen the pathway a formal agreement was adopted whereby a neonatologist from the nearest NICU would review and advise on the neonatal needs of surgical neonates at the paediatric hospital.

The neonatal surgical outreach service

The principal aim of the surgical outreach service was to facilitate patient flow through the surgical centre and so increase capacity, measured by a reduction in out-of-region transfers for surgery. In 2009, a project manager was appointed to lead a team of healthcare professionals in setting up the service. Funds were provided for:

- staff and equipment
- two intensive care surgical cots at the local NICU
- a specialist paediatric dietitian and speech and language therapist to give support across one of the neonatal networks
- a paediatric surgeon to visit the designated NICU daily to support the management of surgical neonates
- a full-time neonatal surgical nurse to provide outreach support for staff and patients in the NICU and other neonatal units or paediatric wards caring for neonates in the West Midlands area, before or after surgery.

Embracing the sentiment of 'minimising the disruption to the lives of these children and their families and providing them with services as close to home as possible, where appropriate',[4] the brief of the outreach service was to:

- support neonatal staff caring for babies before transfer for surgery until a surgical cot was available, which is possible in some circumstances and could avoid a transfer out of region
- identify babies at the surgical centre who would benefit from being transferred post-operatively back to a neonatal unit with the appropriate facilities, if supported by the outreach service.

It was recognised that this model of care would involve a change in culture and expectations for healthcare professionals and families (**FIGURE 2**).

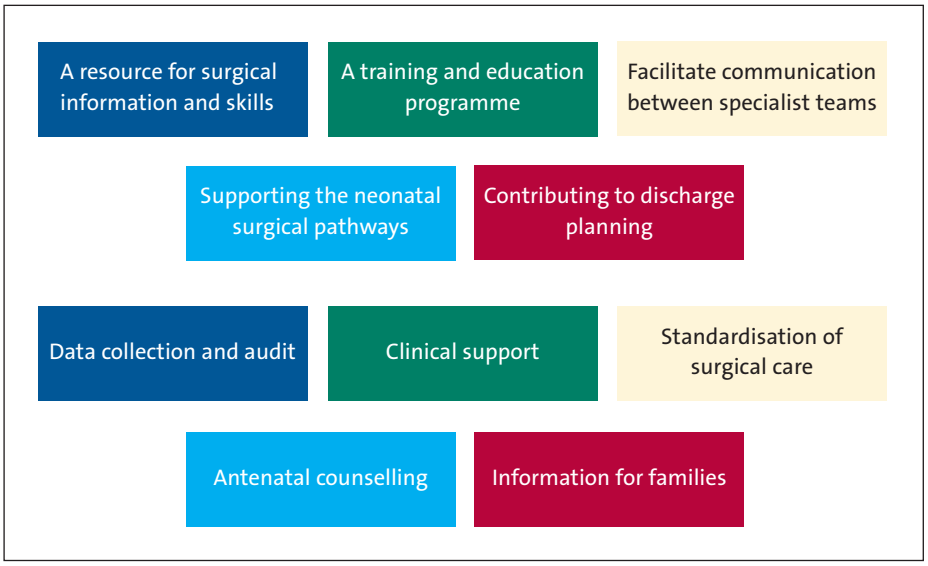

FIGURE 2 The roles of the Birmingham Children's Hospital Neonatal Surgical Outreach Service.

FIGURE 3 Information given to parents at antenatal counselling and on admission to the surgical centre.

Staff

During the initial scoping exercise the opinions of the staff working in the stakeholder organisations were sought. There was general agreement that often many time-consuming phone calls had to be made to find a cot in a surgical centre for a baby, and parents were not prepared for the possibility of their baby having to go miles away for treatment. Often babies did not return to their local neonatal unit after surgery, but were discharged home from the surgical centre. Even when babies did go back to their neonatal unit after surgery, the operation and surgical care plan were often unclear. The consensus was

that support with a managed surgical care pathway would be welcome.

Families

Families were consulted with the help of the parent representative on the working group. It was apparent that the journey from diagnosis of a surgical condition to discharge home was often confusing and isolating. As the baby and the family move from one organisation to another and from one professional team to another, there are many opportunities for miscommunication and for established, trusting relationships to be interrupted. It was envisaged that the surgical outreach team would provide continuity for the patient and family, from antenatal or postnatal diagnosis, with regard to the surgical plan and communication with the surgeon as progress was made along the pathway.

It was recognised that active management of parents' expectations was both necessary and welcome to provide structure and reassurance at a time of great anxiety. When it was clear that a baby would need surgery, it was explained to parents that this intervention was an episode in the care pathway and once it was appropriate the baby may return to the referring unit, but with the necessary support from the neonatal surgical outreach team (**FIGURE 3**). It had been our experience that parents were often afraid to leave the surgical centre after surgery, worried about being separated from the surgical team and the ongoing surgical information and care. This conversation has become part of antenatal counselling with the paediatric surgeon and outreach nurse; verbal and written information is given to parents, along with a visit to the neonatal surgical ward or paediatric intensive care unit. Early involvement of the outreach team ensures that accurate information can be provided in a timely fashion and reinforced when necessary rather than giving large quantities of information at a time of intense stress.

The challenges

Once the resources were provided, the main challenge was how to configure a successful service that would achieve a reduction in the number of newborn infants having to go out-of-region for surgery and to provide excellent surgical care across organisational boundaries. We were aware of one other established outreach service in Leeds and this proved to be a good place to start. The generosity of the Leeds' staff with their time and advice was invaluable.

As with any innovative undertaking there is a degree of risk but with encouragement from supportive managers and colleagues, and the ultimate goal of helping to improve the neonatal surgical service for the West Midlands, it was worth pursuing.

The complex nature of the surgical conditions required a collaboration of neonatal and surgical colleagues, and allied health professionals. As paediatric professionals, we needed the guidance of our neonatal colleagues when assessing the resources available at each level of neonatal unit in order to agree a pathway for the neonates returning after surgery.

Training and education

Surgical knowledge and skills varied across the region, particularly among neonatal nurses as they often come into the specialty from a range of professional disciplines. Monthly teaching sessions on surgical conditions and care were attended by the nursing staff at the local NICU and study days were arranged for other neonatal units in the network. Surgical guidelines were written and their use promoted and referred to by the outreach nurse when reviewing patients. A record of the support provided by the outreach nurse was kept to identify gaps in knowledge and to inform the development of teaching programmes required. Neonatal units were encouraged to keep a ready supply of basic equipment and dressings needed for surgical care and the outreach nurse worked with the staff to increase their confidence in their surgical skills. This was also necessary so that staff could teach parents new skills as part of planning for discharge.

Neonatal surgical pathways

The *NHS Toolkit for High-Quality Neonatal Services*[5] provided an example of a surgical care pathway and suggestions for local adaptation. Although some women may choose to deliver in the perinatal centre, this is not considered necessary for the majority of congenital conditions requiring surgery. The Toolkit recommends that babies should not be transferred back to their local neonatal unit after surgery unless specialist neonatal surgery input is either no longer required or can be provided by an outreach service.

Managing the safe and efficient movement of sick neonates through a clinical pathway requires good communication and co-ordination of services. A 'one number' referral system to the surgical centre with early involvement of the transfer service was piloted. Keeping parents informed was and is a key objective. Neonatal unit cot capacity in the local networks and a variation in facilities for parents present continuing challenges to the functioning of the pathway.

Achievements

Professional relationships

The Birmingham Children's Hospital

	Pre-2009	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Annual number of out-of-region neonatal transfers*	Estimated at 50-100	23	9	2	5	17	14	15	12
Bed days saved at the surgical centre **	No data available	No data available	1008	2073	1962	1478	1582	1298	2154
Outreach patients seen by an outreach nurse ***	No data available	No data available	91	110	116	75	72	68	78

TABLE 1 Successes of the Birmingham Children's Hospital Neonatal Surgical Outreach Service, which began in 2009. *The annual number of out-of-region transfers for neonatal surgery. Numbers include ventilated and non-ventilated neonates. **The annual number of bed days saved at the surgical centre by managing patients at a local unit with outreach input thus creating an increased capacity for surgical admissions. ***The annual number of patients seen by an outreach nurse, either pre-operatively or post-operatively.

Neonatal Surgical Outreach Service has now been operating for eight years. One of the most heartening and rewarding aspects of the work has been the forging of successful and effective professional relationships across organisational boundaries. Without exception, the outreach team has been welcomed by healthcare teams in a spirit of cooperation and respect, and viewed as a resource to be used. In turn, the outreach team is mindful of the complex dynamics of the relationship between families under stress and the primary team caring for their baby, and careful that all communication goes through the primary team so that parents are reassured there is always a clear and coherent plan of surgical care overseen by the surgeon.

Providing a neonatal surgical outreach service from the paediatric surgical centre to the regional neonatal networks has strengthened relationships between the organisations and the outreach nurse sits on the board of the local network, facilitating mutual understanding of the needs and challenges of the two disciplines.

An award

In 2011 the outreach service, nominated by the West Midlands Operational Delivery Newborn Networks, won an award by the All-Party Parliamentary Group on Maternity for the 'most marked improvement in services to address health inequalities or improve outcomes for mothers and babies'.

This was seen as recognition of the success achieved by a multidisciplinary team working toward a common goal for the benefit of patients and their families.

Summary of the successes of the outreach service

Increased capacity

The number of neonates transferred out-of-region for paediatric surgery has reduced since the establishment of the outreach service in 2009 (**TABLE 1**). A positive impact on the availability of surgical cots has been achieved by a daily multidisciplinary team meeting to review the progress of all paediatric surgical neonates in the surgical centre with a view to agreeing the correct time for them to transfer back to an appropriate neonatal unit or paediatric ward with outreach support. As a consequence, there is increased capacity for neonates waiting for surgery (**TABLE 1**). In addition, some neonates who would have required a surgical cot for pre-operative nursing care, (eg decompression of the gut or conservative management of exomphalos major), can safely have their admission delayed until a cot becomes available, or avoided altogether (**TABLE 1**).

Standardisation of care

In order to improve surgical care across the region and to address variations that parents might encounter as their baby moved from one hospital to another, written surgical guidelines and information for parents were developed by a group comprising a surgeon, a neonatologist, a parent and a surgical nurse specialist. This information is made available to the referring neonatal units for use before transferring to the surgical centre, and promoted by the outreach team.

Wound care, dressings and other equipment were also standardised after consultation with the relevant specialists, with the outreach team as the constant factor providing continuity of care. The surgical outreach patients at the NICU are reviewed daily by a consultant surgeon and the outreach nurse. The remaining surgical outreach patients in the local newborn networks are visited by the outreach nurse and discussed formally at a weekly grand round with all the paediatric surgeons.

Data collection

Databases were set up to collect information on the number of neonates going out-of-region for surgery to record whether it was due to lack of an intensive care cot or a ward cot. The numbers of babies requiring surgical outreach support and the duration and nature of the support provides information on the number of surgical cot days made available and directs the training and education programme for staff development and parent support.

2010

"Considerable progress has been made in developing the joint Birmingham Children's Hospital NHS Foundation Trust- Birmingham Women's Hospital NHS Foundation Trust neonatal surgery service... Reviewers found mutual respect between different parts of the service with everyone acknowledging the contributions and expertise of others. Several good guidelines have been developed and implemented..."

"The service is not yet meeting all of the expected quality standards. Continued focus and determined drive towards implementing the standards is essential if the service is to work in the way described in the service specification."

2015

"The neonatal surgical outreach service has become a particularly strong aspect of the service."

TABLE 2 Comments included in the 2010 and 2015 WMQRS reviews.

Training and education

The dual aims of the neonatal surgical outreach service are to reduce the number of babies going out-of-region for surgery and to promote excellent, family-centred surgical care wherever a baby might be cared for. This requires an ongoing programme of education to explain the purpose of the service in order to promote professional collaboration and to develop the surgical knowledge and skills of the workforce.

Teaching of surgical nursing care is delivered regularly to neonatal units and to pre- and post-registered nurses at the local university. Units are encouraged to support groups of individual staff who can act as a local resource of surgical knowledge and skills. There is also a national stoma care course to which the outreach nurse contributes.

In addition, a national, accredited part-time course has been developed for staff caring for neonates requiring gastro-intestinal or urogenital surgery. This will be the subject of the follow-up article, *Nursing the surgical neonate part 2.*[6]

Summary

In 2010 a peer review visit looking at compliance with the original service specification was carried out by the West Midlands Quality Review Service (WMQRS, **TABLE 2**).[7] A second review in 2015 by the WMQRS[8] looking at the care of newborn babies who may need paediatric surgery concluded that significant progress had been made (**TABLE 2**).

Both reports recognised that the majority of the expected standards were being met and recommendations for meeting the remainder were put forward. The outreach service is committed to contributing to the ongoing provision of integrated care across organisational boundaries for babies who have complex surgical needs and recognises that there are still further opportunities to support these patients and their families, particularly after discharge from hospital.

Acknowledgement

The author would like to acknowledge the hard work and dedication of all those involved in the creation and the continuing success of the Birmingham Women's and Children's NHS Foundation Trust Neonatal Surgical Outreach Service, without whom many more babies would be travelling long distances to access emergency surgery. Special thanks go to Dr Alex Philpott, Lead Consultant, West Midlands Transfer Service, and Mr Anthony Lander, Specialist Paediatric Surgeon, for their advice and support during the writing of this article. Further thanks to the families who gave their permission for use of the images of their babies.

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Nursing the surgical neonate clinical module

A national, accredited part-time course has been developed for staff caring for neonates requiring gastrointestinal or urogenital surgery. *Nursing the Surgical Neonate: Gastrointestinal and Urogenital Disorders* is a flexible work-based, double module for neonatal and paediatric nurses. Delivery is over a six-month period and consists of 10 study days interspersed with clinical practice with surgical patients in the student's own clinical setting as well as a three-week placement on a neonatal surgical ward. On successful completion of the course, the student will be awarded 40 credits at level 6 or 7.

The course is provided by Southern West Midlands Neonatal Operational Delivery Network in collaboration with Birmingham Women's and Children's NHS Trust and validated by Birmingham City University.

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