

Training and confidence levels among health professionals attending newborn deliveries

Up to 10% of infants require assistance at birth. Paediatricians, neonatal nurses, advanced neonatal nurse practitioners, midwives, obstetricians and anaesthetists could all potentially be involved and each Royal College recommends some form of newborn life support training. However, training and confidence levels among staff present at deliveries are unknown. The study presented here aimed to determine training and confidence levels among the multi-professional team present at infant deliveries.

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There were 729,674 live births in England and Wales in 2012¹ with Wales having around 35,000 live births each year². Much of the medical literature places the number of infants requiring assistance or resuscitation at birth at up to 10%³, with around 1% requiring advanced resuscitation with intubation, chest compressions and drug administration⁴. Often the need for assistance can be predicted, such as in premature delivery or suboptimal cardiotocography, however the unexpected need to assist or resuscitate infants at birth is not an uncommon occurrence.

As well as paediatricians other healthcare professionals may be required to provide assistance to the newborn, at least until help arrives, including neonatal nurses, advanced neonatal nurse practitioners (ANNPs), midwives, anaesthetists and obstetricians. Additionally, foundation and general practice trainees are ever more frequently part of the paediatric junior team attending deliveries. The Royal Colleges of Paediatrics and Child Health (RCPCH), Obstetricians and Gynaecologists (RCOG), Anaesthetists (RCOA) and Midwives (RCM), all recommend formal newborn life support training for their trainees and practitioners who are involved in infant deliveries^{5,6,7}. The Resuscitation Council (UK) also endorses this statement and has a standardised national course: the Newborn Life Support (NLS) course³.

In spite of these recommendations, anecdotal evidence suggests a lack of formal training for healthcare professions

and a variable degree of confidence in resuscitation skills. There is currently an absence of evidence in published literature to substantiate this view. This study aimed to determine the level of newborn resuscitation training among healthcare professionals present at the delivery of infants and assess confidence in performing resuscitation.

Methodology

A survey of multidisciplinary health professionals was distributed across Wales in December 2013 assessing experience, training and confidence levels in performing newborn resuscitation.

The target population for the study was key health professionals in Wales involved in newborn delivery and therefore potentially exposed to neonatal resuscitation. This group involved midwives, neonatal nurses, ANNPs and all grades of doctors in paediatrics, obstetrics and anaesthetics. An online questionnaire was developed and emailed out to the target population via Welsh Deanery representatives in the different medical specialties and local postgraduate centres (**APPENDIX 1**). Midwives and neonatal nurses were also targeted in person with paper versions of the questionnaire. The questionnaire assessed length of experience and level of training, and used a five-point Likert scale to evaluate levels of confidence in performing newborn resuscitation.

The study was a voluntary and anonymous survey among medical professionals; ethical approval was not

Keywords

resuscitation; newborn; education; training

Key points

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1. Up to 10% of infants require assistance at birth and all members of the multidisciplinary team may be involved in resuscitation.
2. There is wide variation in levels of training and confidence with recommendations of the Royal Colleges not currently being met.
3. Where formal training is given, a demonstrable improvement in confidence is seen across the multi-professional team.

required. No incentives were offered for taking part in the study and the reasons for not responding to the questionnaire were not determined.

Results

Survey response

The questionnaire was sent to 624 health professionals across Wales. Responses were received from 232 (37%): 41 anaesthetists, 26 obstetricians, 35 midwives, 58 neonatal nurses/ANNPs and 72 doctors working in paediatrics and neonatology. The greatest response came from training doctors: 46 responses from ST1-3 (junior grade) and 67 from ST4-8 (middle grade). Twenty-three consultants also responded. The responding health professionals worked in district general hospitals (84), tertiary units (146) and midwife led units (2). Eighty-eight per cent of respondents had been involved in newborn resuscitations.

Experience

Ascertaining the experience of the responder was gathered through two questions: 'How long have you been involved in attending deliveries?' and 'How many newborn resuscitations have you been involved in?'

Of the 41 anaesthetists, there were 24 middle grade and 17 junior grade doctors, with the most common length of exposure to newborn deliveries being >24 months. Of the 26 obstetricians, there were 12 consultants, four middle grade and 10 junior grade doctors. The majority (62%) had been attending deliveries for >36 months. Within the midwife cohort, the majority (92%) had been attending deliveries for >36 months. Of the 58 neonatal nurses and ANNPs, the majority (63%) had been attending deliveries for >36 months. Of the 72 responses from the paediatric cohort, there were 19 consultants, 29 middle grade, and 21 junior grade doctors. In addition, responses were received from two general practice trainees and one foundation trainee working as part of a paediatric or neonatal rota. The majority (76%) had >36 months' exposure of attending deliveries. **TABLE 1** shows data for the number of resuscitations actively involved in across the specialties.

Training

Respondents to the survey were asked what, if any, newborn life support training they had received in the last four years. The

Number of newborn resuscitations	0	1-10	11-50	>50
Anaesthetists	14 (34%)	22 (54%)	5 (12%)	0
Obstetricians	7 (27%)	13 (50%)	5 (19%)	1 (4%)
Midwives	2 (6%)	13 (37%)	11 (31%)	9 (26%)
Paediatricians	0	22 (30%)	14 (20%)	36 (50%)
Neonatal nurses/ANNPs	4 (7%)	15 (26%)	24 (41%)	15 (26%)

TABLE 1 Involvement in newborn resuscitations by specialty.

	Newborn Life Support (NLS) course	Advanced Paediatric Life Support (APLS)/ European Paediatric Life Support (EPLS)	In-house alone	Nil
Anaesthetists	3 (7%)	22 (54%)	5 (12%)	11 (27%)
Obstetricians	5 (19%)	0	17 (65%)	4 (15%)
Midwives	10 (29%)	0	22 (63%)	3 (8%)
Paediatricians	58 (81%)	5 (7%)	5 (7%)	4 (5%)
Neonatal nurses/ANNPs	44 (76%)	2 (3%)	12 (21%)	0

TABLE 2 Newborn resuscitation training received in the past four years.

gold standard for training would be an NLS course, or equivalent, every four years.

TABLE 2 analyses the type of training received.

In total, 120 (52%) of respondents had completed NLS training in the past four years (**FIGURE 1**) and of those 73 (31%) had received this training prior to attending deliveries. When considering all forms of training – NLS, Advanced Paediatric Life Support (APLS), European Paediatric Life Support (EPLS) and in-house training – 42% of obstetricians, 53% of anaesthetists, 57% of midwives, 41% of paediatricians and 33% of neonatal nurses had not received any newborn resuscitation training *prior* to attending deliveries.

Confidence

Participants were asked 'How confident do you feel in your ability to provide newborn life support?' with a rating from 'very unconfident' through to 'very confident'. Confidence levels varied between specialties, with a statistically significant increase in those completing an NLS course. Of the 120 who had undertaken NLS training, 115 (96%) found it useful and felt the training assisted them with deliveries.

Among paediatricians, 83% (60) felt 'quite' or 'very confident' about their ability with resuscitation. Within the anaesthetic cohort, the results were more varied with around 25% of staff rating their ability in each of the four categories of 'very unconfident', 'slightly unconfident', 'neutral' and 'quite confident'. Nobody in this cohort rated themselves as 'very confident'. Within the obstetricians, the results were grouped around 'slightly unconfident' and 'neutral' with 61% (16) of the group rating their ability in one of these two categories. Within the midwives' cohort, rating was spread across the categories with those who had undertaken NLS (10) being 'quite/very confident' but in those who had not performed NLS (15) being 'neutral' or 'slightly unconfident'. In the neonatal nurse/ANNP cohort, 45 (77%) felt 'quite' or 'very confident' about their ability with resuscitation. Overall, 105 (87%) of those who had attended NLS training rated their confidence levels as 'quite/very confident'. A statistically significant difference in confidence levels (Chi-square test, $p < 0.001$) was seen in those professionals receiving formal NLS training in the last four years (**FIGURE 2**).

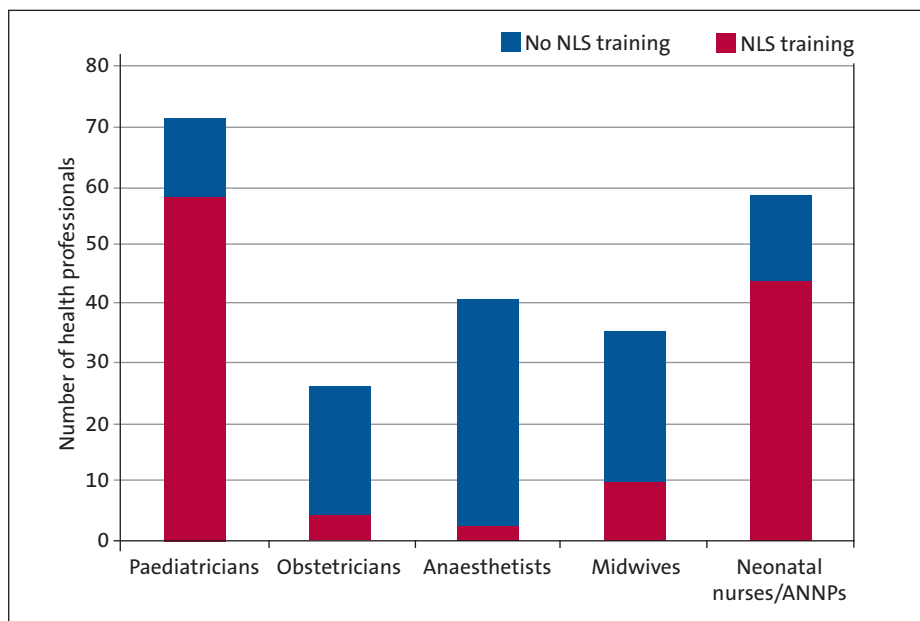


FIGURE 1 Newborn Life Support (NLS) training over the past four years broken down by specialty.

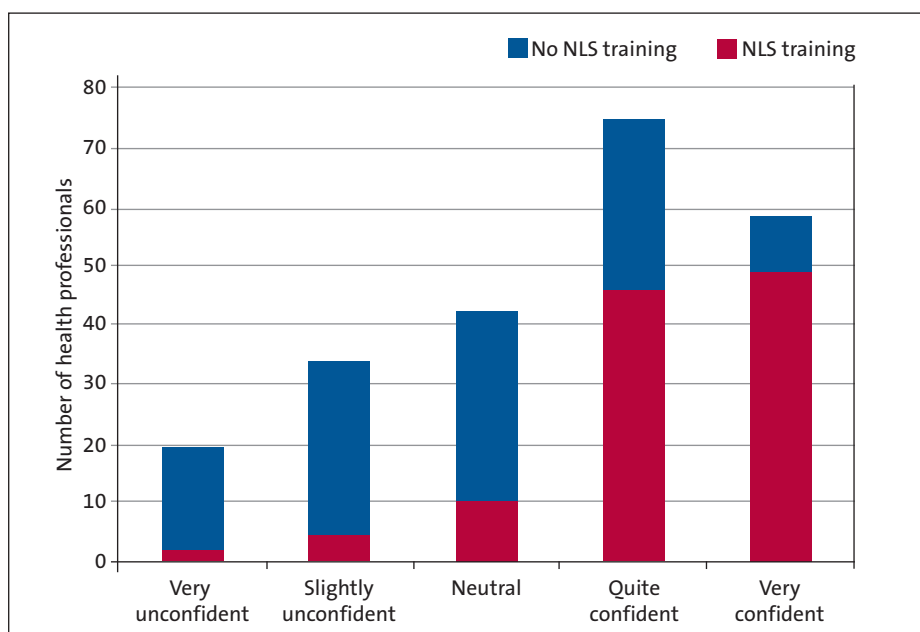


FIGURE 2 Impact of Newborn Life Support (NLS) training on confidence levels.

Discussion

This study has shown that there is wide variation in the level of newborn resuscitation training among healthcare professionals present at deliveries in Wales, with a significant minority of all specialties surveyed receiving no training at all over the previous four years. Additionally, 65% of all responders said they had received no training prior to first attending newborn deliveries. Confidence levels also varied considerably both within and between specialties, but was significantly higher in those receiving formal life support training through NLS courses, with 96% of responders reporting they found it useful

in assisting them at deliveries and 87% rating themselves as quite confident or very confident in providing newborn resuscitation. Sixty-three per cent of obstetricians and midwives had only in-house training for their resuscitation training. While this is clearly better than receiving no training, it is not standardised and, as no assessment is required, the level of knowledge and competence obtained is uncertain.

The level of training required for individual practitioners will vary according to their role within the multidisciplinary team but whether delivery is at home, in a midwifery-led unit, or in an obstetric unit, complications can arise which compromise

the condition of the baby at birth and require immediate attention. For those vital first few minutes of life midwives, obstetricians, anaesthetists and junior paediatricians may find themselves alone in providing assistance to the newborn infant and thus need at least basic level resuscitation skills. Each of the relevant Royal Colleges recommends that all professionals who might be present at the time of birth are proficient in resuscitation of the newborn infant⁷. As an example, the RCPCH curriculum requires paediatricians attending deliveries to be trained in advanced newborn life support (NLS or equivalent), with regular updates of skills. However, the survey demonstrates that not all attending paediatric and neonatal trainees are currently meeting these requirements. In addition, units across the UK, as in Wales, are seeing an increasing proportion of non-career paediatricians (ie foundation and general practice trainees) working on their rotas; this is especially true in smaller, district general hospitals. This study has shown that these clinicians have less experience of attending deliveries, are less likely to have life support training prior to attending deliveries and are less confident in their ability to resuscitate infants at birth. With future reductions in the proportion of paediatric trainees involved in staffing out-of-hours medical rotas likely, this is an important and concerning finding.

The value of regular staff training, including formal training with courses such as NLS has been difficult to prove in highly developed healthcare settings, and randomised controlled trials would be unethical. However, evidence from less developed countries consistently demonstrates reduced morbidity and mortality in both community and hospital settings where such training exists⁴. The study presented here did not assess infant outcomes, but has found that confidence levels are significantly higher among healthcare professionals with NLS or equivalent training.

Guidance from the Royal Colleges suggests that responsibility for ensuring adequate training lies with individuals themselves; however, existing and senior staff have a professional responsibility to ensure their colleagues are adequately trained to provide an appropriate level of assistance and resuscitation to the newborn. Additionally, local health boards need to ensure that arrangements are made

Neonatal resuscitation survey

What specialty do you currently work in?

Midwifery ☐ Paediatrics/neonatology ☐ Obstetrics ☐ Anaesthetics ☐

What grade are you?

Midwife ☐ GP trainee ☐ Foundation trainee ☐ Neonatal nurse/ANNP ☐

Consultant ☐ Specialty senior house officer (ST1-3 or equivalent) ☐

Specialty middle grade (ST4-8 or equivalent) ☐

In what type of unit do you currently work?

Midwifery-led unit ☐

District general hospital ☐

Tertiary ☐

How long have you been involved in attending deliveries?

<1 month ☐ 1-3 months ☐ 3-6 months ☐ 6-12 months ☐

12-24 months ☐ 24-36 months ☐ >36 months ☐

How many newborn resuscitations have you been involved in?

0 ☐ 1-10 ☐ 11-50 ☐ >50 ☐

What training have you had in newborn life support in the last four years?

Advanced Paediatric Life Support (APLS) ☐ Newborn Life Support (NLS) ☐

European Paediatric Life Support (EPLS) ☐ In-house training scenarios ☐

Other (please specify) _____

Did you have this training PRIOR to attending newborn deliveries?

Yes ☐ No ☐

Did this training assist you when attending deliveries?

Yes ☐ No ☐

How confident do you feel in your ability to provide newborn life support?

Very unconfident ☐ Slightly unconfident ☐ Neutral ☐ Quite confident ☐

Very confident ☐

APPENDIX 1 The neonatal resuscitation survey.

to provide suitably trained staff to be capable of offering prompt, safe and effective stabilisation and resuscitation⁸. Midwifery and nursing staff should have neonatal resuscitation training as part of their undergraduate training and it should form part of their regular review once in a professional position. However, this survey suggests that this is not the case and training is not routinely taking part prior to staff attendance at deliveries. Neonatal resuscitation does not form part of the medical undergraduate curriculum.

There are several limitations to this study. The response rate to the survey was 37% and the reasons for lack of response were not sought; it is possible that those not responding had received more training and had higher confidence levels. However,

responses were received from trainees, nurses, midwives and consultants of all grades and levels of experience, suggesting validity of the results. The midwife and neonatal nurse/ANNP cohort did not respond to the electronic survey and therefore a paper version was also used for this group, creating a discrepancy in data collection methods for this cohort. However, midwives and nurses working in different units responded, including both obstetric centres and midwife-led centres, and a range of experience levels were captured, again adding validity to the results.

Finally, there are some clinicians who will not be expecting to pursue careers that will expose them to many newborn deliveries (for example non-obstetric anaesthetists, foundation trainees and

general practice trainees). However, any of these individuals could find themselves present for the delivery of a newborn infant at some stage of their training and hence it was felt that their inclusion was vital in informing future training strategies. Emergency department staff and paramedics were not included in the study but the importance of training for these professionals is acknowledged and any future studies should consider their inclusion.

Conclusion

Appropriate training in resuscitation, such as NLS, is vital for any health professional who may be in attendance at newborn deliveries. This training should be undertaken prior to commencing a job that will require this role and skills should be updated and refreshed at regular intervals. Where formal training is given, a demonstrable improvement in confidence is seen across the multi-professional team and is likely to improve patient safety.

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