ANNEX 4

Midwifery Led Units

1.Introduction

Policy context

Over the past twenty years there has been policy emphasis on increasing choice in relation to place of birth. The National Service Framework (NSF) for Children, Young People and Maternity Services, 2004 stated that women should be able to "*choose the most appropriate place to give birth from a range of local options including. ..delivery in midwife led units"*.(1)

A midwifery led unit (MLU) can be defined as a place that offers care to women with a predefined uncomplicated pregnancy and where midwives are the lead professional for intrapartum care.(2) Medical services including obstetric, neonatal and anaesthetic care are available in a consultant led unit (CLU). However in the case of a standalone midwifery unit transfer to these services by ambulance would be needed.

Today approximately four percent of women have their babies in a community facility such as a midwifery led unit.(3) In 2005-06 2.6% of all NHS deliveries were homebirths compared to 2.3% in 2004-05.(4)

The proposal outlined in Making it Better for Mother and Baby, Feb, 2007 is that:

"the NHS should offer women a range of settings to give birth in, appropriate to their needs and wishes, taking account of safety and any risks as a key priority.(3)

All women should have the choice of the following services:

- *A home birth supported by a midwife*
- *Birth in a local facility under the care of a midwife such as a designated midwifery unit. The unit might be based in the community, or in a hospital; patterns of care will vary across the country to reflect different local needs. These units usually promote a philosophy of "normal" and natural births*
- *Birth supported by a local maternity care team that included a consultant obstetrician. For some women this will be the only safe option. These teams are nearly all hospital based"*

Local context

The future configuration of maternity services in East Sussex is currently under review: a Public Consultation with Hastings and Rother and East Sussex Downs and Weald Primary Care Trusts. The development of another midwifery led unit (MLU) for East Sussex is proposed in two of the four options outlined in the Public Consultation document.(5) Hence this paper describes the evidence base; configuration and relevant learning from other MLUs nationally.

2. Purpose

- To review current evidence from the literature about the safety of giving birth in different settings, including midwifery led units and obstetric led care.

- To describe stand-alone midwife led units in England and Wales, particularly noting the number of deliveries and distance from the nearest obstetric unit.

- To identify units of similar scale to those proposed in East Sussex that also operate at comparable distance.

- To seek relevant learning from those units that would allow the PCTs in East Sussex to assess and manage the risks involved in safely transferring women between units under the configuration of service proposed

3 Literature review

A literature search was requested from BSUH library services Three relevant systematic reviews about the outcomes in midwifery led units compared with obstetric units were identified. The reviews are shown in table 1.

The three reviews are well conducted and have been updated recently.

The Cochrane collaboration systematic review includes only randomised controlled trials and these are of "home-like" birth settings usually situated within an obstetric unit.(6) No randomised controlled trials (RCTs) of free-standing midwifery led units were identified. The review includes a meta-analysis of outcomes. The overall conclusion of this review was that:

"Home-like birth settings are intended for women who prefer to avoid medical intervention during labour and birth, but who either do not wish or cannot have a home birth. The results of six trials suggest modest benefits, including decreased medical intervention and higher rates of spontaneous vaginal birth, breastfeeding and maternal satisfaction. However there may be an added risk of perinatal mortality."

The NPEU structured review focuses only on midwifery led unit care and includes qualitative and quantitative data from 34 studies.(7) The authors commented on the poor quality of the data overall and conclude:

"Birth centre care can offer the possibility of accessible, appropriate, personal maternity care for women and their families. There is substantial support from women accessing care, their families, maternity care health professionals and service managers for care in birth settings, which are clearly differentiated from obstetric-led maternity services.

No reliable evidence about clear benefit or harm associated with birth centre compared with any other type of intrapartum care offered in the NHS was identified in this review. The gap in the evidence base for care (birth centre or standard) should be addressed urgently…"

Table 1. Systematic reviews about outcomes in midwifery led units

Review	Authors	Included studies	Outcomes
Home-like versus conventional institutional settings for birth. Cochrane collaboration, 2005 Last updated 12 November, 2004 (Reference 6)	Hodnett ED, Down S, Edwards N, Walsh D	Six randomised controlled trials involving 8677 women. Included studies were of home-like birth settings characterised by a philosophical orientation towards normal birth. No trials of freestanding birth centres were found.	Transfer rate before or during labour 29-67% Allocation to a home like setting significantly increased the likelihood of no intrapartum analgesia RR 1.19 (95% CI 1.01 to 1.40); spontaneous vaginal birth RR 1.03 (95% CI 1.01 to 1.06); perineal tears RR 1.08 (95% CI 1.03 to 1.13); preference for same setting next time RR 1.81 (1.65 to 1.95); satisfaction with intra partum care RR 1.14 (1.07 to 1.21); and decreased the likelihood of episiotomy RR 0.85 (0.74 to 0.99). There was a non statistically significant trend to higher perinatal mortality in the home-like setting RR 1.83 (95% CI 0.99 to 3.38)
Review of evidence about clinical, psychological and economic outcomes for women with straightforward pregnancies who plan to give birth in a mid-wife led birth centre, and outcomes for their babies. National Perinatal Epidemiology Unit for the Maternity Research Group of the National Service Framework (NSF) for Children, Young People and Maternity Services. December, 2004, updated July 2005 (Reference 7)	Stewart M, McCandlish R, Henderson J, Brocklehurst P. (NPEU)	Published reports that described at least one clinical, psychological or economic outcome for women who had planned to or gave birth in a birth centre. 34 quantitative and qualitative studies were included.	Criteria for admission; Socio-demographic variables of women; transfers from birth centres to obstetric care; Mode of birth; analgesia use, perineal trauma; blood loss/ PPH; perinatal mortality; serious perinatal morbidity; Apgar scores, birth weights; psychological outcomes; NHS trust data.
Second consultation on chapter 3, Planning place of birth, Intrapartum care. 2007 National Collaborating Centre for women's and Children's Health. Commissioned by NICE, 2007 (Reference 2)	NCCWCH (NICE)	(Women planning birth at a standalone midwifery unit compared with obstetric unit) Five cohort studies. One from the UK, three from the US and one from Germany.	(Women planning birth at a standalone midwifery unit compared with obstetric unit) Characteristics of women, mode of birth, analgesia use, perineal trauma, haemorrhage, perinatal mortality, APGAR score, psychological outcomes.

The NCCWCH review for NICE compares home with hospital birth; midwifery unit versus hospital birth and along side units compared with hospital birth.(2) There is a structured review of five cohort studies comparing midwifery unit birth with hospital birth. The report concludes

"The quality of evidence available is not as good as it should be for such an important health care issue and most studies do not report complete or consistent outcome data. Planning birth outside an obstetric unit seems to be associated with an increase in spontaneous vaginal births, an increase in women with an intact perineum and improved maternal satisfaction.

Of particular concern is the lack of reliable data, relating to relatively rare but serious outcomes such as IPPM (intrapartum-related perinatal mortality) in all places of birth. The GDG was unable to reassure itself that planning birth in a non-obstetric setting is as safe in this respect as birth in an obstetric unit."

The report recommends that:

"Women should be offered the choice of planning birth at home, in a midwifery led unit or in an obstetric unit. Women should be reassured that intrapartum-related perinatal mortality is low in all settings. Before making their choice, women should be informed of the variable quality of the information comparing the potential risks and benefits of each birth setting…"

The paper goes on to describe the information that should, as a minimum be given to women to allow them to make an informed choice about standalone midwifery units:

- *Women who planned birth in a standalone midwifery unit have had more spontaneous vaginal birth and intact perineum compared with those who planned birth in an obstetric unit.*
- *There is no relevant information to assess serious risk to mother or baby, including intrapartum-related perinatal mortality in a standalone midwife unit compared with planning birth in an obstetric unit.*
- *Local transfer rates should be given for both women having their first and subsequent babies. Evidence shows about 12% of women in labour will transfer to the obstetric unit.*

NICE also give clear guidance on the identification of women for whom midwife led delivery will be appropriate.

Criteria for midwifery care during birth (2)

- normal pregnancy without complications
- up to and including para 5 with uncomplicated previous births
- labouring at term (37–42 completed weeks of gestation)
- singleton pregnancy with cephalic presentation,does not want an epidural.

Data limitations and research requirements

The NPEU evidence on maternal and infant outcomes for standalone midwifery-led units is reported to be '*of poor quality, and derived mainly from small scale observational studies. Outcomes were inconsistently defined and reported with a high likelihood of bias. It was likely that there was disproportionate publication of positive or negative results.*'(7)

Similarly NICE states that '*there is only poor-quality evidence available on maternal and baby outcomes for standalone midwifery units…there is no evidence on perinatal mortality*'. Perinatal mortality was not reported in any of the five included studies.(2)

NPEU comments that:
"development and introduction of national standards for routine data collection in maternity care, and strategies for audit would also be key components to understanding outcomes of care."(7)

"Additional information, for example about proximity of a birth centre from maternity services which offer medical care including obstetric and neonatal care should be collected in a standard way." (7)

"A standardised system of data collection should be developed and implemented in NHS Trusts to record and evaluate why women are transferred from birth centres to obstetric care, and the processes of transfer. This should include data collection to allow audit of women's experiences of care." (7)

NPEU on NHS Trust data collected:
"…there is inconsistency in data and information collected and it is therefore inappropriate to compare results between NHS Trust….within –trust evaluation may be limited because data were not collected which could allow comparison of birth centre with standard care."(7)

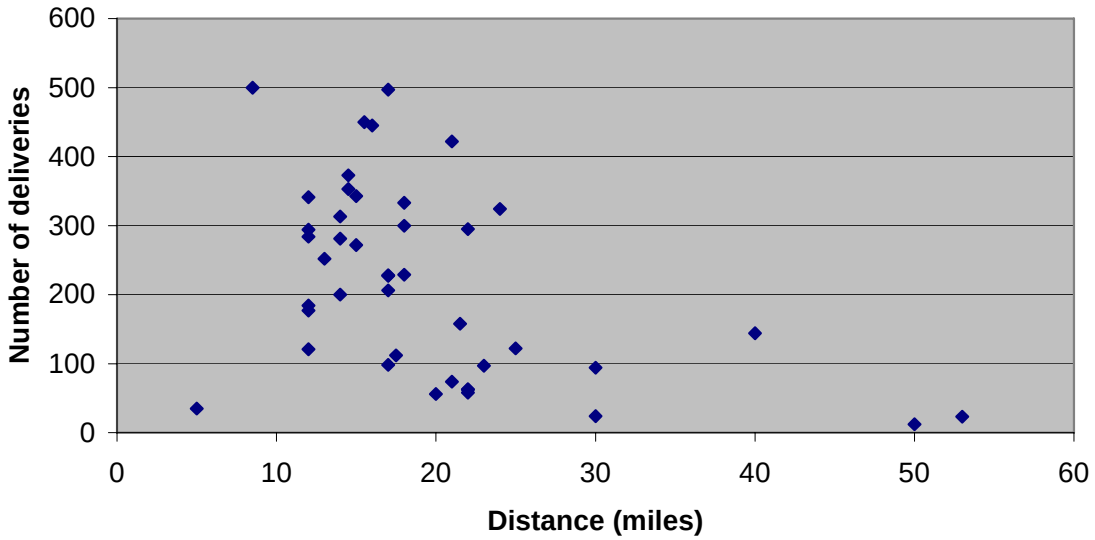
"A standardised system of data collection should be developed and implemented in NHS Trusts to record and evaluate

- *why women art transferred from birth centres to obstetric care and the process of transfer*
- *Levels of postpartum maternal blood loss and rates of post partum haemorrhage using an agreed definition*
- *Apgar scores and other measures of neonatal well being*
- *Rare maternal and neonatal outcomes (mortality and major morbidity)."*(7)

4 Learning from existing MLUs

Figure 1 is a scatter plot of data for the number of deliveries and distance to consultant led unit (CLU) for 43 midwifery led units (MLUs) nationally. *Source West Wiltshire PCT.* Some units may be situated on a general or acute hospital site but without 24 hour obstetric cover. Most units are situated more than ten miles from their nearest consultant unit (CLU).

Figure 1. Scatter plot of the number of deliveries in MLUs in England and Wales by distance from the nearest obstetric unit. N=43



All MLUs delivering more than 300 babies each year are situated between 9 and 24 miles from their nearest obstetric unit. There are a few units with a small number of deliveries at much greater distance from the CLU. These represent geographical extremes for example the Isles of Scilly and Berwick.

Informal telephone survey of MLUs

We contacted six of the larger units operating at a similar distance to that proposed in the consultation. This was to ascertain what information was available about transfer times and outcomes (Table 1) Information was also received from Gwent Healthcare. The narrative can be reviewed as appendix 3. In addition we present information available from the Crowborough and East Kent midwifery led units.

Key points regarding activity

- Three of the units contacted were found to have shorter transfer distances/times or fewer deliveries than indicated (ie less than 20 miles)
- One unit, situated 24 miles from the nearest consultant unit was a down-graded DGH site with access to gynaecology, anaesthetists and paediatricians
- Two midwifery led units (MLUs) transferred women to one consultant unit (CLU). Two to two consultant units. One to three and one to five consultant units. This highlighted the potential difficulties for Trusts of tracking outcome data once women are transferred to obstetric units.
- The number of deliveries ranged from one hundred to five hundred.
- Only two units were able to supply audit data about transfer times. For these units the range was 30-55 minutes and 20-60 minutes depending on which consultant unit was chosen to transfer to (Source data: East Kent Audit). The time measured in the East Kent audit was the time the patient left the midwifery led unit to the time the patient arrived at the consultant led unit.
- Three units estimated their transfer times to be 30-40 minutes.
- Transfer times were not routinely audited by units.

Table 1. Activity of selected midwifery led units in England

	Distance to nearest CLU (AA Route Planner)	Transfer times (Audit evidence)*	Number deliveries, 2006	Transfer rate
Crowborough	10.9 miles/20mins, Pembury 24.7 miles/40 mins Eastbourne 16.2miles/23mins Princess Royal	-	262 (Apr 2006-Jan 2007)	20.1% (Apr 2006-Jan 2007)
Canterbury	14.9miles/22mins, WHH, Ashford 17.6 miles/29 minutes QEQM, Margate	30-45 minutes (WHH, Ashford)* 45-55 minutes (QEQM, Margate)*	198 (Aug 05-Jan 06)	16.8% (Aug 05-Jan 06)
Dover	22.4 miles/25mins WHH, Ashford 20.7 miles/33mins QEQM, Margate	20-35 minutes (WHH, Ashford)* 45-60 minutes (QEQM, Margate)*	-	-
Ashcombe, Weston Super Mare	24.3 miles/ 43 minutes, Bristol	-	500 approx	-
St Mary's, Melton Mowbray	17.8 miles/ 30 minutes, Leicester	-	300 approx	29%
Neath	15.5 miles/ 22 minutes	-	-	-
Helm Chase	22 miles/ 29 minutes, Lancaster 30.6 miles/52 minutes Furness	-	309	19.7%
Corbar, Buxton	13.8 miles/23 mins Macclesfield 18.2 miles/31 mins Stepping Hill	Unit estimated times of 30 and 40 minutes respectively.	123	14-20%
Penrice, Cornwall	14.3 miles/ 20 minutes	Unit does not audit times. Unit estimated time 30-40 minutes	327	30%
Gwent, Wales	14 miles	35-40 minutes. Unit estimated time	400 approx	10-11% over 4 years

***Audit data

Transfers

The reasons for transfer were available from two of the units in the telephone survey. The data shown is for purely descriptive purposes with data from Crowborough and the East Kent units. It is not intended to provide a comparison between units as the numbers are relatively small. The commonest reasons for transfer are delay in the first or second stage (37-70%) transfers and fetal distress (8-21%) transfers.

Table 2 Number (percentage) of transfers.

	East Kent Nov-March 2006/7	Crowborough April 2006/ Jan 2007	Cornwall 2006	Helm Chase 2006
Transfers	N=96	N=60	N=145	N=76
Slow progress first or second stage of labour	44 (46%)	42 (70%)	53 (37%)	49 (65%)
Fetal distress	21 (21%)	10 (16%)	28 (19%)	6 (8%)
Obstetric reason	6 (6%)	3 (6%)	37 (26%)	7 (9%)
Postpartum reason	10 (10%)	0 (0%)	7 (5%)	10 (13%)
Analgesia	-	5 (8%)	20 (14%)	4 (5%)
Other	9	0	0	-
Births	401	252	327	307

Outcomes

Outcomes data supplied by Trusts was limited to transfer rates and reasons for transfer, although audit information was available from one Trust (East Kent). Systematic information about neonatal or maternal morbidity or perinatal mortality was not routinely available. Figures, where provided are for descriptive purposes only.

The East Kent audit of 401 births from November 2006 to March 2007 identified 5 babies who were admitted to SCBU, all babies were born in a consultant unit.

For labours commenced in the MLU, the overall rate of spontaneous vaginal birth was 92% for Crowborough, 86% for Canterbury and 90% for Dover birthing centre. The overall caesarian section rate was 5% for Crowborough, 7% for Canterbury and 3% for Dover birthing centre.

We have been advised that there have been no instances of a maternal death at the Crowborough unit since it opened in 1997 based on 2,160 deliveries.(8) There have been no instances of a maternal death at the East Kent MLUs since the reconfiguration of services.(9)

5. Risk management in midwife led care and transfers from stand-alone MLUs: advice from other units

Evidence from visit to East Kent Hospitals Trust

- There are defined clinical risk management processes. Any incident triggers a critical incident form and review process. A senior midwife and obstetrician review each individual case and disseminate any learning points. There have been no instances of a maternal death since the reconfiguration. Instances of still birth or perinatal death are fortunately very rare events. Critical incident analysis of one of these episodes did not raise issues of substandard care in the MLU setting but has led to improved protocols to prioritise assessment of women once they arrive at the CLU.
- There is a monthly perinatal mortality meeting – multidisciplinary attended by all grades of medical staff in obstetrics and gynaecology and paediatrics.
- Professional supervision eg of midwives through the midwifery supervisor.
- Newly trained midwives have to spend their first year of practice in the hospital units, before working in the community.
- Staff are encourage to spend some time in the acute units to encourage team building and good working relationships between hospital and community midwives.

Source: visit to East Kent Hospitals Trust (Canterbury Birthing Centre)

Evidence from telephone survey and visit to East Kent

1. Good risk management practice

- Transfer times are not audited but any unreasonable delay would be reviewed as a critical incident.
- Good working relationships with the ambulance service
- Paramedic training in neonatal life support
- A woman being transferred would always be accompanied by a midwife and a paramedic
- Regular "skills drills" for midwives, such as neonatal life support
- Working to low risk midwifery care guidelines

2. Risk management concerns raised by discussion of individual critical incidents

- Need for clear information to women to ensure that a woman who needs CLU care in labour or premature labour does not present inappropriately to the MLU.
- Need for clear protocols for airways management of neonates by midwives and paramedics.
- Difficulty ascertaining whether a traffic delay is a contributory factor to sub-standard care in a given critical incident.
- Need for protocols to ensure prompt assessment of women at the CLU on transfer from the MLU.
- Management of the rare scenario of an undiagnosed fetal abnormality.

3. Additional material from interviews to inform the service model work

Additional relevant material extracted from the notes of fifteen telephone interviews and visits to services in other areas of the UK are included as appendix 4. The key themes were:

- In the absence of guidance, professional opinions about acceptable maximum transfer times ranged from 30 to 45 minutes (3 responses). There were two comments that there are time critical events for which immediate obstetric intervention is necessary.
- There were two comments (one from a MLU on a District General Hospital site and one from a shared Midwifery and obstetric site) about the potential difficulties of ad hoc arrangements for medical cover where an MLU is situated on a hospital site. Guidelines are clearer on a separate site.
- Two small MLUs (less than 100 deliveries per year) reported no bad outcomes related to distance but patients and staff felt anxious about distance or would attribute poor outcomes to distance. From the larger MLUs (more than 300 deliveries per year), there were two comments about instances in which women may not have been transferred to the most appropriate unit.
- One shared unit commented that the decision for midwifery led care in labour was taken for all women at 36 weeks of pregnancy. (this was also the case for the decision for homebirth in one other area). Key areas of risk management identified were skills and systems (two responses); good paramedic response and monitoring (two responses); joint development of protocols between midwives and obstetricians (one response); Learning from the Wyre Forest Inquiry and having a dedicated clinical governance committee for the MLU (one response).

4. Findings of the Wyre Forest Inquiry

We were advised to review this report, which itemises the risk management recommendations made by an independent statutory inquiry.(10) The birth centre was closed following the deaths of six babies in less than three years. The inquiry identified systemic weaknesses in care and ineffective clinical governance structures and processes. The report highlighted the clinical governance role of the consultant midwife.

The inquiry team additionally commented on the lack of data to make meaningful statistical comparisons with other units. There is much common ground between the clinical governance recommendations made by the inquiry and those of the NICE review of planning place of birth. For this reason the NICE clinical governance guidance is included as appendix 2.

6. Discussion and Conclusion

1.Evidence from the published literature

The NICE review acknowledges the limitations of the evidence base:

"The evidence concerning outcomes related to planned place of birth is not as good as it should be for such an important health issue. There is a lack of reliable data concerning intrapartum perinatal mortality in all places of birth."(2)

The principle recommendation from NICE is underpinned by informed consent for women and the need for comprehensive clinical governance structures in all places of birth.

"*Women should be reassured that intrapartum-related perinatal mortality is low in all settings. Women should be offered the choice of planning birth at home, in a midwifery unit or in an obstetric unit. Before making their choice, women should be informed of the variable quality of the information comparing the potential risks and benefits of each birth setting"*(2)

In the published literature, there was a lack of information about distance between the MLU and CLU and the relationship with outcomes. The NPEU review recommended *"additional information, for example about proximity of a birth centre from maternity services which offer medical care including obstetric and neonatal care should be collected in a standard way."*(7)

2. Distance between midwifery led units and consultant led units

The overall proportion of deliveries in England in MLUs is approximately four percent. (3) However a review of information about midwifery led units nationally suggests that the model of care is widely adopted. (Figure 1) Most units delivering more than 300 babies per year are situated between 9 and 24 miles from their nearest consultant led unit. The majority of all units are situated more than 10 miles from their nearest consultant unit.

We were able to identify only one audit of transfer times (MLUs in East Kent August 05-Jan 06). For these MLUs the range was 30-55 minutes and 20-60 minutes depending on which consultant unit was chosen. Three of the larger MLUs estimated that their transfer time was 30-40 minutes. In the absence of guidance, there was limited anecdotal evidence from professional opinion in other services that the acceptable maximum transfer time was in the order of 30 to 45 minutes.

3. Activity, transfers and outcomes

The overall transfer rate was 10-30% based on data received from MLUs.
The commonest reasons for transfer were delay in the first or second stage (37-70%) transfers and fetal distress (8-21%) transfers. Systematically collected information about neonatal or maternal morbidity or perinatal mortality was not routinely available.
Deaths are rare events. Hence it is difficult to monitor rare outcomes in a relatively low number of deliveries. The overall perinatal mortality rate for E&W is in the order of 8 per 1,000 births. (11) The confidential enquiry into Maternal deaths covering the period 2000-02 shows the number of mothers dying as a direct or indirect result of

pregnancy of childbirth to be one in 7,750.(12) These figures include all the most complex cases: the important question is the relative safety of "low risk" births in different settings. National research and data needs have been identified in this area for example a national registry of the root cause analysis of all the findings of all intra-partum related deaths.(2)

4. Data quality issues

There are data collection issues about outcomes in many of the units we contacted, even where specific audits have been undertaken. Transfer times are not routinely audited. Some units were unable to provide detailed data for outcomes due to the difficulties in collating a special transfer questionnaire. If transfers occur between a MLU and a CLU within the same trust the outcomes should be entered on the midwifery data system. However some MLUs transfer to CLUs in a number of different trusts hence the transfer history may be lost. Even when transfers are within the same trust, the results from a recent audit from East Kent highlighted difficulties with ensuring data completeness (personal communication from Consultant Midwife, East Kent Hospitals Trust).

The NPEU authors reviewed five audits of NHS Trust data and commented that there was inconsistency in data and information collected and it was therefore not possible to compare results between NHS Trusts.(7) Perinatal mortality, Apgar score and birth weight were not supplied in the majority of audits.(7)

The Wyre Forest Inquiry highlighted data needs to the extent that statistical analysis of outcomes was not possible as part of the investigation due to lack of comparative data.(10) The NICE clinical governance guidelines have highlighted the poor coverage and lack of quality of current data and proposes national surveillance of safety and intra-partum related deaths.(2)

5. Risk management

There was consensus from the information we received from other Trusts about the importance of robust and comprehensive risk management strategies to underpin the service model.

Key components were

- Working to "low risk" protocols.
- Review of critical incidents by senior midwives and obstetricians.
- Rotation of community and hospital midwives.
- "Skills drills" for MLU staff
- Training for paramedics
- Multi-disciplinary development of protocols eg for transfers
- Audit of ambulance response times
- Learning from the Wyre Forest recommendations
- Dedicated clinical governance arrangements for the MLU

References

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11. Confidential Enquiry into Maternal and Child Health. Stillbirth, neonatal and post-neonatal mortality 2000-2003. England, Wales and Northern Ireland, April 2005.

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Appendix 1

NICE Recommendations on planning place of birth (2)

Women should be offered the choice of planning birth at home, in a midwifery unit or in an obstetric unit. Women should be reassured that intrapartum-related perinatal mortality is low in all settings. Before making their choice, women should be informed of the variable quality of the information comparing the potential risks and benefits of each birth setting. As a minimum this information should include:

Home birth:

- Women who have planned birth at home have more spontaneous vaginal birth, a reduced likelihood of caesarean section, and more likelihood of intact perineum, compared with those who planned birth in an obstetric unit.
- The uncertain evidence suggests intrapartum-related perinatal mortality (IPPM) for booked home births, regardless of their eventual place of birth, is the same as, or higher than for birth booked in obstetric units. [D]
- If IPPM is higher, this is likely to be in the group of women in whom intrapartum complications develop and who require transfer into the obstetric unit. [D]
- Local transfer rates should be given for both women having their first and subsequent babies. Evidence shows between 4% and 20% of women in labour (nulliparous 30–55%; parous 1–15%) will transfer to the obstetric unit. [D]
- When unanticipated obstetric complications arise, either in the mother or baby, during labour at home, the outcome of serious complications is likely to be less favourable than when the same complications arise in an obstetric unit. [D(GPP)]
- If birth is planned and takes place at home the IPPM is likely to be the same as in a low risk group of women giving birth in an obstetric unit. [D(GPP)]

Standalone midwifery unit:

- Women who planned birth in a standalone midwifery unit have had more spontaneous vaginal birth and intact perineum compared with those who planned birth in an obstetric unit. [C]
- There is no relevant information to assess serious risk to mother or baby, including intrapartum-related perinatal mortality in a standalone midwife unit compared with planning birth in an obstetric unit. [D]
- Local transfer rates should be given for both women having their first and subsequent babies. Evidence shows about 12% of women in labour will transfer to the obstetric unit. [D]

Alongside midwifery unit:

- Women who planned birth in an alongside midwifery unit had more spontaneous vaginal birth and intact perineum compared with those who planned birth in an obstetric unit. [B]
- There may be added risk of perinatal mortality when birth is planned in an alongside unit, compared with when planned in an obstetric unit, although the evidence is not strong. There is no information about intrapartum-related perinatal mortality. [B]
- Local transfer rates should be given for both women having their first and subsequent babies. Evidence shows about 24–30% of women in labour (nulliparous about 35%; parous about 12%) will transfer to an obstetric unit. [D]

Obstetric unit:

- Women are likely to have access to obstetric and neonatal facilities, as well as epidural analgesia. [D(GPP)]
- It reduces the likelihood of spontaneous vaginal birth and intact perineum compared with birth outside an obstetric unit. [C]
- The uncertain evidence suggests intrapartum-related perinatal mortality for booked birth in an obstetric unit is the same as, or lower than for birth booked at home. [D]
- There is no relevant information to assess intrapartum-related perinatal mortality in an obstetric unit, compared with a standalone midwife unit. [D]
- There may be reduced risk of lower perinatal mortality when birth is planned in an obstetric unit, when compared with birth planned in an alongside unit, although the evidence is not strong. There is no information about intrapartum-related perinatal mortality to compare with birth planned in an alongside unit. [B]

Appendix 2

NICE Clinical governance recommendations in all places of birth.(2)

Clinical governance structures should be implemented in all places of birth: [D(GPP)]

- Multidisciplinary governance structures, of which the Labour Ward Forum is an example, should be in place to enable the oversight of all places of birth. The clinical governance group should include, as a minimum, midwifery (ideally a supervisor of midwives), obstetric, anaesthetic, and neonatal expertise and include user representative or parent.
- Rotating staff between obstetric and midwifery units should be encouraged in order to maintain equivalent competency and experience.
- There should be agreed criteria for women planning to give birth in each setting.
- Clear pathways must be in place for midwives who wish to seek advice on the care of women whom they consider may have risk factors but who wish to labour outside an obstetric unit. A supervisor of midwives should be identified to fulfil this role and clear referral paths need to be established. The woman can choose to give birth wherever she wishes and should be supported in her choice.
- If a woman has a risk factor (listed in Section 3.3, ‘Assessment for choosing place of birth’) and wishes to give birth outside an obstetric unit, a supervisor of midwives should be involved.
- If an obstetric opinion is sought by either the midwife or the woman on the appropriate place of birth, this should be obtained from a consultant obstetrician.
- All healthcare professionals should document discussions with women about her chosen place of birth in the hand-held maternity notes.
- In all places of birth, the processes of risk assessment in the antenatal period and when labour commences should be subjected to continuous audit.
- Monthly figures of numbers of women booked, being admitted to, being transferred from, and giving birth in each place of birth should be audited. This must include maternal and neonatal outcomes.
- The clinical governance group must be responsible for the detailed root cause analysis of any serious maternal or neonatal adverse outcome (intrapartum perinatal death or seizures in the neonatal period) and consider ‘near misses’ found through risk management systems. CEMACH and the NPSA ‘Seven steps to patient safety’ can provide a framework for meeting clinical governance and risk management targets.
- These data must be submitted to the national registries for either intrapartum-related perinatal mortality or neonatal encephalopathy once these are in existence.

When women labour outside of an obstetric unit:

- Clear pathways and guidelines on the indications for, and the process of transfer to, an obstetric unit should be established. There should be no barriers to rapid transfer when required in an emergency.
- Clear pathways and guidelines should also be developed for the continued care of women once they have transferred. These pathways should include arrangements for when the nearest obstetric unit is closed to admissions.
- If the emergency is such that transfer is not possible, open access must be given for any on-site appropriate staff to deal with whatever emergency has arisen.
- There should be continuous audit of the appropriateness of the reason for and speed of transfer. Conversely, audit also needs to consider circumstances in which transfer was indicated but did not occur. Audit should include time taken to see an obstetrician and time from admission to birth once transferred.

A national surveillance scheme which allows appropriate comparisons, including safety and cost-effectiveness, of all places of birth should be established to address the poor quality and lack of coverage of current data. [D(GPP)]

National registries of the root cause analysis of all of the findings of all intrapartum-related deaths over 37 weeks of gestation should be established. [D(GPP)]

A definition of neonatal encephalopathy should be agreed and a national register commenced. The information collected should also include data on transfer during labour from each of the different birth settings. [D(GPP)]

There is a need to establish a single generic health-related quality of life index value for the multi-attribute perinatal and maternal outcomes of intrapartum care. [D(GPP)]

Appendix 3
Narrative from the informal telephone survey of midwifery led units.

1. Ashcombe Maternity Unit, Weston Super Mare.
Information from the midwifery services manager. The majority of transfers go to the Bristol regional centre at St Michael's Hospital, 25 miles away. Southmead and Thornton Hospitals are 30 and 20 miles away respectively. They are in a District Hospital site. They can put a 222 call out for an anaesthetist – in an emergency – although this appears to be an informal arrangement due to the location of the MLU. Ante-natally there is consultant availability 9-5. Post partum there is SHO gynae cover eg for perineal tear. The large number of bookings reflect the fact that all local antenatal care is delivered by the unit. 500 women deliver each year in the MLU. The site was down-graded in 1996 after an external risk assessment.

2. St Mary's Birth Centre, Melton Mowbray
Information from the manager of the MLU and the Euroking manager.
The unit is 15 miles from the level 2 neonatal unit at Leicester General Hospital and 18 miles from the level 3 unit at Leicester Royal. They also transfer out to Nottingham City Hospital, Queen's Medical Centre and to Peterborough. Last year there were approximately 300 deliveries and an intra-partum transfer rate of 29%. Operational issues: the unit uses low risk midwifery care guidelines. A woman transferred in labour would always be accompanied by a midwife and a paramedic. Historically there was a neonatal flying squad: paramedics have neonatal training. Midwives are NLS trained. Historically the unit evolved over many years.

3. Helme Chase Midwife led Unit
Information from the community matron. It is a stand alone unit with no medical cover. The nearest consultant led unit is 25 miles ("25 minutes on the motorway"). The other is 33miles ("45 minutes by A road"). Good working relationship with ambulance services: emergencies categorised as category A calls. Down-graded from hospital with consultant cover in 2001.

4. Corbar Maternity Unit, Buxton.
Information from the midwife on duty. It is a stand-alone unit serving a rural community. There are two consultant led units Stepping Hill, 19 miles away ("30-40 minutes away on the A6") or Macclesfield 14 miles ("30 minutes, over the hill so depends on the weather"). The transfer rate is 14-20%. The unit books approx 600 women each year. Of these 300 are suitable for MLU at booking 123 delivered at the MLU last year. Main reasons for transfer: retained placenta, failure to progress, meconium stained liquor, raised BP, perineal suturing.

5. Penrice Midwife Led Unit, St Austell
There is one acute unit at Truro 19 miles away. Transfers take 30-40 minutes. Times are not usually audited but any unreasonable delay would be reviewed as a critical incident. Due to geography of Cornwall a lot of women elect for home births rather than travelling all the way to Truro. Current restructuring of community midwifery means that community midwives in some areas will travel in to deliver low risk women at Truro. All night-time calls are triaged through Penrice. There were 327 deliveries last year. 160 total transfers.

6. Gwent Healthcare
We have one stand-alone birth centre that is situated 14 miles from the DGH and obstetric/neonatal service. We have 400 births per year and currently run a transfer inactive labour rate of 5% which is particularly low. We risk assess carefully and over the last four years since opening the transfer rate has been 10-11%. The ambulance responses are generally good and transfer time is approx 35-40 mins. I cannot give data for other Trusts but Powys LHB in Mid Wales have five stand alone birth centres and no DGH so they transfer long distances over very rural areas into several different Trusts and transfer times can be one hour plus.

Appendix 4
Additional material from interviews conducted for the service model review

1. Borders General
(Current service model no midwifery led unit)
"…Have looked at MLU possibility and found that the numbers might not be viable, and the 1 hour plus transfer time might be problematic."

2. Buckinghamshire
(Current service model two shared midwifery and consultant units)
"Did a big project on MLUs - visited eleven."
"They only decide whether woman can use MLU at 36 weeks."
"Learnt from Wyre Forest review, and have an MLU governance committee to review all cases going through MLU."
"Double running has been a helpful learning process."
"30 minutes transfer in an ambulance is fine. It's not the distance. It's being organised and responding quickly and appropriately."
"Foetal distress and haemorrhage are 'the biggies'. Only one foetal distress in two years."
"Must avoid pushing the limits / blurring the boundaries in selection and in operational process.
MLUs on a DGH site is more tricky because potential to want to consider calling on site staff."

3. Huddersfield and Calderdale
(Proposed reconfiguration to MLU 4.8 miles distant from the nearest CLU)
Head of Midwifery took the view that 30 minutes was the maximum distance for an MLU in the absence of a definitive ruling. In Yorkshire there is no local MLU to learn from.
Clinical Director noted that under certain scenarios a 45 minutes journey (plus extra from decision to transfer to labour ward) is going to be critical, but the vast majority of emergency situations can withstand an hour.
Good management will depend on active, live risk assessment in labour and early transfer
Time critical: *massive haemorrhage;sudden acute foetal bradycardia (with prolapses or abruption);Poor condition neonate needing resuscitation*
Less time critical: *Failure to progress;foetal distress*

4.North Cumbria
(Current service model Penrith birth centre 36 births / year; 26 miles to obstetric unit)
Safe urgent transfer in labour is managed through: long experience; proper risk assessment; being clear with women where they need to go; needs good ambulance support
'45 minutes not a problem'. Clinical Director
'Would not be worried about transfers with 35minutes blue light transfers'
Already have that from Penrith (though on motorway)
Key to safe transfer is trained experienced midwives who are very aware of guidelines.
Establishing MLU with low delivery rates needs to be staffed with team midwifery and on call not a three shift rota.

5.North Lincolnshire
(Current service model MLU with 60 births per year)
Midwifery 'room' has existed for 5 years
Numbers of births have fallen.
Very few transfers ('down to selection criteria')
Transfers: depends on good paramedic response (both home deliveries and MLUs)
Transfer to Doncaster in an emergency ('slightly closer - about 5 minutes') (20 miles, 29 minutes RAC).
Distance creates anxiety for staff and women but no SUIs attributed to distance

6.North Devon
(Current service model: consultant and midwife care running in parallel in CLU.)
There are 10 percent home deliveries, some at some distance from the unit.
There are very robust risk management systems, and very strict criteria, jointly developed by midwives and consultants.
Midwives dial 999 and get a blue light ambulance to CLU.
Maybe one SUI where distance was an issue. This was a communication breakdown where the woman was taken to Exeter.
No evidence that women who are assessed as low risk are at risk under midwifery led care. Would not see our plans for distance as a problem but would want to see a system that maintains skills in managing high risk mums.
It's not the distance or time it's what sort of incident it is. So for those who need a crash C-section any distance is too far. For almost everything else distance is not really the issue, its about skills and systems.

7.United Lincolnshire
(Current service model: Grantham MLU 80-100 births per year, on DGH site)
MLU never taken off
Grantham MLU 50 minutes – 1 hour from consultant led unit
High unit costs
Safety – depends on how safe is safe. No safer than at home.
Midwives and paramedics resuscitate and transfer.
No bad outcomes since 1998 because of distance but patients have felt that distance (or lack of on site obstetrics) was a factor.
General MLUs very safe for multips but with primips transfer rate is high.

8.Weston
(Midwifery led care for labour only, MLU on district general hospital site.)
Guidelines and criteria are much clearer to operate in a stand alone unit away from a hospital site.
Working MLU at distance: sounds very feasible: very similar to what is operated in Weston. Need to look at ambulance availability not just journey times (need to monitor all the time)
Ambulance mustn't regard MLU as a 'place of safety' otherwise attendance could be delayed especially if sited on a general hospital
Need an on-call service to back fill for midwives who go with transfer
Very strict booking criteria
Audit all transfers
Ambulances occasionally bring women who should have been taken elsewhere.
No SUIs where transfer/ travel has been a factor in a bad outcome.