

Evidence for GAIN Guideline for Admission to Midwife-led units in Northern Ireland June 2015

This guideline was developed in accordance with the GAIN Advice for Guideline Development in Northern Ireland and is to assist women and maternity care providers in their decision-making with regard to place of birth for women with a straightforward singleton pregnancy at the point of labour. A team of health professionals, lay representatives and technical experts known as the Guideline Development Group (GDG) with support from GAIN, were established following requests for nominations from main stakeholder organisations. These included maternity service providers, women's and parents' groups, for example: Heads of Midwifery, Midwives, Consultant Obstetricians, Consultant Anaesthetists from the HSC Trusts, a GP, Midwifery Advisor, a representative from the Public Health Agency, NI Practice and Education Council, Royal College of Midwives, Sure start, Parenting NI and Mothers' Voice (a HSC Maternity Service Liaison Committee).

The consensus of the GDG was that if there is any uncertainty regarding admission or care, multidisciplinary discussion is necessary with appropriate documentation.

From the outset, the GDG defined a straightforward pregnancy as:

'a singleton pregnancy, in which the woman does not have any pre-existing condition impacting on her pregnancy, a recurrent complication of pregnancy or a complication in this pregnancy which would require on-going consultant input, has reached 37 weeks gestation and \leq Term +15'
(p.3)

The guideline was developed as the result of an in-depth iterative process, which utilised expert professional, experiential knowledge and a range of robust evidence. We undertook a structured search and review of literature on a range of topics areas identified by the GDG as areas where guidance was required, resulting in the published guideline criteria for admission to midwife-led units in Northern Ireland (GAIN, 2016). The search strategy involved a search of CINAHL, Cochrane, PubMed, Medline, Maternity and Infant Care Databases. Back-chaining of reference lists from relevant papers and documents and an online search of departmental strategic and professional resources was also undertaken (See Table 1).

Table 1 Strategic and Professional Resources

American Nurse Midwifery Association (www.midwife.org)
Department of Health Social Services and Public Safety (www.dhsspsni.org.uk)
Guidelines and Audit Implementation Network (www.gain-ni.org)
National Institute for Health and Care Excellence (www.nice.org.uk/)
Regulation and Quality Improvement Authority (www.rqia)
Royal College of Midwives (www.rcm.org.uk)
Royal College of Obstetricians and Gynaecologists (www.rcog.org.uk)

(See evidence tables relating to each criterion for admission to midwife-led units in Northern Ireland)

Inclusions and Exclusions

The Guideline Development Group discussed key evidence utilising the expertise from clinicians and users by experience. The evidence for the guideline was focused on the population of women of childbearing age (16 years +) with straightforward singleton pregnancy at the point of labour who planned to birth in a midwife led unit. In total, there were 20 criteria included in the final version of the guideline (although some other criteria such as Gestational Diabetes were considered for inclusion but following discussion by the GDG were excluded). The final criteria were focused on being as inclusive as possible for pregnant women and the review questions were therefore based on the following:

1. Maternal age at booking
2. BMI at booking
3. Hb level
4. Number of previous births
5. Assisted conception with Clomifene or similar
6. SROM \leq 24hrs & no signs of infection
7. Women on Tier 1 and Tier 2 of the Integrated Perinatal Mental Health Care Pathway
8. Threatened miscarriage, now resolved
9. Threatened preterm labour, now resolved
10. Suspected low lying placenta, now resolved
11. Medical condition that is not impacting on the pregnancy or the woman's health
12. Women who have required social services input and there is no related impact on the pregnancy or the woman's health

13. Previous congenital abnormality, with no evidence of reoccurrence
14. Non-significant (light) meconium in the absence of any other risk
15. Uncomplicated third degree tear/previous extensive vaginal, cervical, or third degree perineal trauma following individual assessment
16. Serum antibodies of no clinical significance
17. Women who have had previous cervical treatment, now term
18. Previous PPH, not requiring blood transfusion or surgical intervention
19. Prostaglandin induction resulting in the onset of labour
20. Group B Streptococcus positive in this pregnancy with no signs of infection

The GDG judged the evidence against their suitability for inclusion as criteria for Alongside Midwifery Unit (AMU) or a Free standing Midwifery Unit (FMU).

Strengths and Limitations of the Body of Evidence

In recent years, there has been an increase in the number of high quality studies and professional guidelines which support the provision of care for women who plan to birth in Midwife led units rather than obstetric units. The limitations of the current body of evidence does not allow for the GDG to include women with complex pregnancies, e.g. gestational diabetes. Therefore, further high quality research is required and will be included if available in future updates of the guideline.

Consensus Methods Used for Literature and Recommendations

Throughout the process of the review, consultation with a wide range of stakeholders informed the development of the criteria and guidelines. However, each of the 20 criteria were discussed with the Guideline Development Group members and agreement reached through consensus.

Dates Searches Were Undertaken

Searches were undertaken from January 2009 to November 2014 and only those papers written in English were included. In addition, the GDG members were encouraged to bring additional published evidence that came to light during the guideline development process from the national and international links.

Declaration of Interests

At the start of the guideline development process all GDG members' interests were recorded on a standard declaration form that covered consultancies, fee-paid work, share-holdings, fellowships and support from the healthcare industry. At all subsequent GDG meetings, members were required to declare any new or arising conflicts of interest. No conflicts of interest were declared for this guideline.

Table A.	Maternal age at booking ≥ 16 yrs & ≤ 40 yrs (FMU & AMU)/ <16 or >40 (AMU)
Table B.	BMI at booking $\geq 18\text{kg/m}^2$ & $\leq 35\text{kg/m}^2$ (FMU & AMU)/ $\geq 35\text{kg/m}^2$ & $\leq 40\text{kg/m}^2$ with good mobility
Table C	Last recorded Hb $\geq 100\text{g/l}$ (FMU & AMU)/Hb $>85\text{g/l}$ (AMU)
Table D	No more than 4 previous births (FMU & AMU)/No more than 5 previous births (AMU)
Table E.	Assisted conception with Clomifene or similar (FMU & AMU)/IVF pregnancy at term (excluding ovum donation & maternal age >40 years) (AMU)
Table F	SROM ≤ 24 hrs & no signs of infection (FMU & AMU)/ SROM > 24 hrs, in established labour & no signs of Infection (AMU)
Table G	Women on Tier 1 of the Integrated Perinatal Mental Health Care Pathway (FMU & AMU)/Women on Tier 2 of the Perinatal Mental Health Care Pathway following individual assessment (AMU)
Table H	Threatened miscarriage, now resolved (FMU & AMU)
Table I	Threatened preterm labour, now resolved (FMU & AMU)
Table J	Suspected low lying placenta, now resolved (FMU & AMU)
Table K	Medical condition that is not impacting on the pregnancy or the woman's health (FMU & AMU)
Table L	Women who have required social services input and there is no related impact on the pregnancy or the woman's health (FMU & AMU)
Table M	Previous congenital abnormality, with no evidence of reoccurrence (FMU & AMU)
Table N	Non-significant (light) meconium in the absence of any other risk (FMU & AMU)
Table O	Uncomplicated third degree tear (FMU & AMU)/Previous extensive vaginal, cervical, or third degree perineal trauma following individual assessment (AMU)
Table P	Serum antibodies of no clinical significance (FMU & AMU)
Table Q	Women who have had previous cervical treatment, now term (FMU & AMU)
Table R	Previous PPH, not requiring blood transfusion or surgical intervention (AMU)
Table S	Prostaglandin induction resulting in the onset of labour (AMU)
Table T	Group B Streptococcus positive in this pregnancy with no signs of infection (AMU)

Table A: BMI at booking $\geq 18\text{kg/m}^2$ & $\leq 35\text{kg/m}^2$ (FMU & AMU)/ $\geq 35\text{kg/m}^2$ & $\leq 40\text{kg/m}^2$ with good mobility

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comments/Reference
NICE (2014a), UK	Guideline CG 190	Age	Indicated individual assessment when planning place of birth if >35 years of age on booking.	Table 9
RCOG (2010), UK	Green Top Guideline No 55		Point up association of advanced maternal age with IUFD; age not specified; specific recommendation for care not provided. The adjusted odds ratio for age ≥ 35 years compared with ≤ 25 years was 5.1 (95% confidence interval).	Fretts (2005); Froen (2001).
MBRRACE (2013), UK	National Surveillance data Report		Increased rates of stillbirth, neonatal mortality and extended perinatal mortality were seen in both the youngest (<20 years) and the oldest (>40 years) mothers	P. 55: Mothers characteristics CEMACH (2009)
RQIA (2012), NI	A Review: baseline assessment to inform the provision of care & admission of children to adult wards	<16 year (AMU) ≥ 16 (FMU & AMU)	Recommended age limits on children moving to adult wards. Sought assurances that up to date British National Formulary for Children is available on adult wards so that staff can ensure medication decisions are correct.	PLEASE NOTE: The Guideline Development Group (GDG) advised that regarding management of teenage girls in labour, AMU's are suitable for planned place of birth (although all other risk factors need to be addressed) - In the case of a pregnant teenager who is under 16 requiring intravenous fluids in labour, the paediatric protocol is to be followed and care transferred to a

Table B: BMI at booking $\geq 18\text{kg/m}^2$ & $\leq 35\text{kg/m}^2$ (FMU & AMU)/ $\geq 35\text{kg/m}^2$ & $\leq 40\text{kg/m}^2$ with good mobility (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comments/Reference
NICE (2010), UK	PH Guideline 27	BMI	'Lack of evidence on the underlying mechanism linking the gestational weight gain and pregnancy outcome'	Recommendation 2 Pregnant Women Do not weigh women repeatedly during pregnancy as a matter of routine. Only weigh again if clinical management can be influenced or if nutrition is a concern.
NICE (2014a), UK	Clinical Guideline 190		One of the factors indicating increased risk with suggested planned birth at an obstetric unit is a 'BMI at booking of greater than 35 kg/m ² '.	Table 7: Other factors indicating increased risk suggesting planned birth at an obstetric unit (P.19)
			BMI greater than 35 kg/m ² considered a risk for PPH.	P.74
NICE (2014c), UK	Clinical Guideline 62		'Maternal weight and height should be measured at the booking appointment, and the woman's body mass index should be calculated (weight [kg]/height[m] ²).' 'Repeated weighing during pregnancy should be confined to circumstances in which clinical management is likely to be influenced'.	P. 22; Sections 1.5.1.1 1.5.1.2
			Women who have a body mass index 30 kg/m ² or above at their booking appointment or are underweight (body mass index below 18 kg/m ² at first contact) require additional care	P. 47 Appendix C: Women requiring additional care
RCOG (2010), UK	Green Top Guideline No 55		Point up association of obesity with IUFD; specific recommendation for care not provided	Arendas (2008);Fretts (2005); Froen (2001); Huang (2000)

Hollowell (2013), UK	Systematic Review	<p>Risks of complications during childbirth go up with increasing BMI among these healthy women. But the researchers found the increase was modest. Overweight, obese or very obese women showed a relative increase in risk of 6-12% compared to women with a normal BMI. Most of the additional risk of needing treatment was accounted for by giving drugs for slow labour among those with a high body mass index, though risks of serious outcomes for mother and baby were also increased. However, whether a woman has had a previous baby plays a larger role in influencing the chances of needing hospital care. 53% of women of normal weight having their first baby had an intervention or a complication at birth. The figure was 21% for very obese but otherwise healthy women having a second or subsequent baby.</p>	P348
		<p>Otherwise healthy multiparous women obese women may have lower antepartum risks than previously appreciated</p>	P 343
Aune (2014), UK	Systematic Review & Meta Analysis	<p>'Evidence suggests that maternal obesity increases the risk of fetal death, stillbirth, and infant death; however, the optimal body mass index (BMI) for prevention is not known'. 'The optimal prepregnancy BMI to prevent fetal and infant death has not been established'.</p>	P 1536
NICE (2014c), UK	Clinical Guideline 62	<p>'Maternal weight and height should be measured at the booking appointment, and the woman's body mass index should be calculated (weight [kg]/height[m]²).</p>	P22

Lawrence et al, (2013), Australia	Cochrane Review	Importance of Mobility	Upright and ambulant positions versus recumbent positions and bed care: women randomised to upright positions in labour have shorter labours and less likely to have caesarean	P.2
-----------------------------------	-----------------	------------------------	--	-----

Table C: Last recorded Hb \geq 100g/l (FMU/AMU)/ Hb $>$ 85g/l (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comments/Reference
NICE (2014a), UK	Clinical Guideline 190	Hb	Haemoglobin of 85-105g/litre at onset of labour;	Page 19, Table 8 Medical Conditions indicating individual assessment when planning place of birth
			Maternal Haemoglobin below 85g/l at onset of labour should deliver in an obstetric unit	P.74; 1.14.29
			Maternal Haemoglobin level below 85 g/litre at onset of labour a risk factor for PPH; advise give birth in Obstetric unit	P.74

Table D: No more than 4 previous births (FMU/AMU)/ No more than 5 previous births (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guideline 190	4 Previous Births	'Grand multiparity (parity 4 or more) is considered a risk for PPH; advise give birth in Obstetric unit.	Page 74; Section 1.14.29 The GDG members agreed that the GAIN NI MLU Guidelines would use the terminology '5 previous births' which equates to a Parity of 4.
NICE (2014a), UK			Para 4 or more; Other factors indicating individual assessment when planning place of birth	Table 9

Table E: Assisted conception with Clomifene or similar (FMU & AMU)/ IVF pregnancy at term (excluding ovum donation & maternal age >40 years) (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
Okun (2014), Canada	Systematic review - Clinical Practice Guideline	Assisted Conception	'Increased evidence that infertility or subfertility is an increased risk factor for obstetrical complications & adverse perinatal outcomes, even without the addition of	P.64
EI-Chaar (2009), Canada	Retrospective Cohort Study	Assisted Human Reproduction	'Increased risk of birth defects associated with Assisted Human Reproduction (AHR) and the risks are higher with In Vitro Fertilisation (IVF) and (IUI)'. who are already predisposed to pregnancy complications. However, even when comparing age matched controls there appears to be an increased risk of complications associated with infertility, with a higher rate of caesarean section delivery, obstetric haemorrhage, pre-eclampsia, pregnancy-induced hypertension and gestational diabetes all noted in older women having IVF'.	P.1557
RCOG (2012), UK	Scientific Impact Paper	In Vitro Fertilisation	'Increasing maternal age is a risk factor for almost all pregnancy and perinatal complications. The average age at which women attempt to conceive continues to rise and consequently IVF is increasingly used by older women who are already predisposed to pregnancy complications. However, even when comparing age matched controls there appears to be an increased risk of complications associated with infertility, with a higher rate of caesarean section delivery, obstetric haemorrhage, pre-eclampsia, pregnancy-induced hypertension and gestational diabetes all noted in older women having IVF'.	P. 6 The Guideline Development Group using expert professional, local and user knowledge advocated for inclusion of the 'age' limit and 'at term' wording within this criteria.
Wiggins & Main (2005), USA	Retrospective Review	Donor egg & IVF	Increased risk of pregnancy induced hypertension utilising donor egg however 'excellent outcomes can still be expected'	GDG therefore specified the exclusion of ovum donation and maternal age >40

Table F: SROM ≤ 24hrs & no signs of infection (AMU/FMU)/ SROM > 24hrs, in established labour & no signs of infection (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guidelines, CG 190a		<p>If no signs of infection in the woman, do not give antibiotics to either mother or the baby, even if membranes ruptured >24 hours.</p> <p>If evidence of infection, prescribe a full course of broad spectrum Intravenous antibiotics.</p> <p>Closely observe and assess any baby born to a woman with prelabour rupture of membranes that is > 24 before established labour.</p>	<p>P.882</p> <p>Recommendation 278, P 821</p>

Table G: Women on Tier 1 of the Integrated Perinatal Mental Health Care Pathway (AMU/FMU)/Women on Tier 2 of the Perinatal Mental Health Care Pathway following individual assessment (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
SE Trust,(2013), NI	Care Pathway	Mental Health	Advice based on NICE Clinical Guideline 192 which categorises women into Tiers 1-4 with recommendations for management.	P 3-4
NICE (2014b), UK	Clinical Guideline 192		'All healthcare professionals providing assessment and interventions for mental health problems in pregnancy and the postnatal period should understand the variations in their presentation and course at these times, how these variations affect treatment, and the context in which they are assessed and treated (for example, maternity services, health visiting and mental health services)'.	Section 17.1
NICE (2014a), UK	Clinical Guideline 190		Indicate individual assessment when planning place of birth if under current outpatient psychiatric care.	Table 9
			Indicate increased risk suggesting planned birth at an obstetric unit.	Table 6

Table H: Threatened miscarriage, now resolved (AMU/FMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guideline 190	Threatened Miscarriage	Threatened miscarriage (i.e < 24 weeks), can plan to birth in MLU Indicate individual assessment when planning place of birth if antepartum bleeding of unknown origin (single episode after 24 weeks gestation).	Table 9; The criteria makes it clear that it applies to 'threatened miscarriage; now resolved' (i.e. woman now at
			Other factors indicating increased risk suggesting planned birth at an obstetric unit-Recurrent antepartum Haemorrhage	Table 7

Table I: Threatened preterm labour, now resolved (AMU/FMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guideline 190	<i>Threatened</i> Preterm labour	<i>NICE 2014 CG 190- Preterm labour or preterm prelabour rupture of membranes</i> are factors indicating increased risk Suggesting planned birth at an obstetric unit. However, the criteria in the GAIN MLU guidelines relate to 'threatened preterm labour'- see comments.	Table 7; The GDG members agreed that the GAIN NI MLU Guidelines would include woman who experienced a <i>threatened</i> preterm labour and her pregnancy has now reached term

Table J: Suspected low lying placenta, now resolved

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014c), UK	Clinical Guideline 62	Low-lying placenta	'Because most low-lying placenta detected at the routine anomaly scan will have resolved by the time the baby is born, only a woman whose placenta extends over the internal cervical os should be offered another trans abdominal scan at 32 weeks'	Section 1.9.4 Placenta Praevia (low-lying placenta) 1.9.4.1

Table K: Medical condition that is not impacting on the pregnancy or the woman’s health (FMU & AMU)

Author/Date/ Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guideline 190	Medical Conditions	Individual assessment for medical conditions needed when planning place of birth. However, the GAIN MLU guideline applies specifically to a medical condition that is not impacting on the pregnancy or the woman’s health. However, it is also recommended that – ‘ <i>If any uncertainty, multidisciplinary discussion is necessary, with appropriate documentation</i> ’	Table 8. P.19 As there are numerous medical conditions, it is not possible to give specific advice for each one (many may have no impact on a pregnancy or a woman’s health); therefore individual assessment is required to .

Table L: Women who have required social services input and there is no related impact on the pregnancy or the woman's health (FMU/AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2010), UK	Clinical Guideline 110	Social Services	'Examples of complex social factors in pregnancy include: poverty; homelessness; substance misuse; recent arrival as a migrant; asylum seeker or refugee status; difficulty speaking or understanding English; age under 20; domestic abuse. Complex social factors may vary, in both type and prevalence, across different local populations' (p10).	The Guideline Development Group using expert professional, local and user knowledge advocated for the inclusion of this criteria which focused on those social factors where there was 'no related impact on the pregnancy or the woman's health' in order that women who have 'social' services input are not excluded from planning to birth in an MLU. As with all the criteria in the GAIN MLU Guideline, if any uncertainty, multidisciplinary discussion is necessary.

<p>NI Maternity Strategy (2012), Northern Ireland</p>	<p>Maternity Strategy</p>	<p>The aim of the strategy is to ‘provide high quality, safe sustainable and appropriate maternity services to ensure the best outcome for women and babies’.</p> <p>A partnership approach between health and social care staff and members of the public is advocated.</p> <p>‘This is because clinical treatment, emotional care and social factors are inextricably linked during a woman’s pregnancy’ (p15). How ‘to access care and the importance of presenting early in pregnancy, regardless of previous clinical history or social circumstances’ (p41) is highlighted- a universal partnership approach is advocated.</p>	<p>Objective 1 from NI Maternity Strategy</p>
<p>Devane et al (2010), Ireland Hodnett et al (2010), Canada; Sandall et al, (2010), UK Renfrew et al, (2014) ,UK; Sandall et al, (2013), UK; Tracy (2005), (2013), NZ</p>	<p>Systematic review; Cochrane review; Systematic Review Lancet Cochrane Review; RCT</p>	<p>Women who deliver in a MLU are less likely to have unnecessary intervention, have a spontaneous vaginal delivery and are more likely to breastfeed.</p> <p>The social and health benefits for women and their family are also reported</p>	

Table M: Previous congenital abnormality, with no evidence of reoccurrence (FMU/AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
RCOG (2010), UK	Green Top Guidelines 55	Previous Congenital Abnormality	'Previous Intrauterine Fetal Death (IUFD) related to a known non recurrent cause merits individual assessment for place of birth'	Section 10.2
NICE, (2014a), UK	Clinical Guideline 190		Recommends individual assessment when planning place of birth for woman with previous stillbirth/neonatal death with a known non-recurrent a known non-recurrent cause	Table 9. The GAIN GDG considered the evidence and carefully considered the evidence and carefully worded this criteria to highlight the importance of 'no evidence of reoccurrence' in current pregnancy when planning

Table N: Non-significant (light) meconium in the absence of any other risk (FMU/AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guideline 190	Non-significant (light) meconium in the absence of any other risk	'Significant meconium- defined as dark green or black amniotic fluid that is thick or tenacious, or any meconium-stained amniotic fluid containing lumps of meconium'	Section 1.5.2
			'If significant meconium is present, transfer the woman to obstetric-led care provided that it is safe to do so and the birth is unlikely to occur before transfer is completed'	Section 1.5.4

Table O: Uncomplicated third degree tear (AMU)/ Previous extensive vaginal, cervical, or third degree perineal trauma following individual assessment (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guideline 190	Cervical or perineal trauma	Indicate individual assessment when planning place of birth for woman with previous complication of 'extensive vaginal, cervical, or third- (or fourth) degree perineal trauma'	Table 9 The GAIN GDG considered the evidence and carefully
Edozien (2014), UK Ali et al (2014), Ireland	Cohort study Retrospective data search	Cervical or perineal trauma	'The relative risk of a repeat tear is a five-fold increase and the absolute risk of a repeat tear is about 7 in 100'. '...that no studies have generated a model that accurately and definitively predicts recurrence antenatally' (p53). 'Only intervention that significantly impacts on Anal sphincter Injury recurrence is elective prelabour caesarean section but obviously this carries its own risks which must be discussed in the context of the patient's other obstetric issues, co- morbidities and short and long-term obstetric plans (p53).'	worded this criteria to highlight the importance of <i>uncomplicated</i> third degree tear for a woman planning to birth in FMU/AMU and the inclusion of women with a previous extensive vaginal, cervical, or third degree perineal trauma to plan to birth in AMU only after individual antenatal assessment.

Table P: Serum antibodies of no clinical significance (FMU/AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comments/Reference
NICE (2014a), UK	Clinical Guideline 190	Serum antibodies	Medical Conditions indicating increased risk suggesting planned birth at an obstetric unit include atypical antibodies which carry a risk of haemolytic diseases of the newborn.	Table 6. The GDG considered this carefully and noted that women with serum antibodies of no clinical significance are often excluded from planning to both in a MLU. Therefore it was important to include this as an inclusion criteria

Table Q: Women who have had previous cervical treatment, now term (FMU/AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guideline 190	Previous Cervical Treatment	Indicate individual assessment when planning place of birth for woman with 'previous Gynaecological history of Cone biopsy or large loop excision of the transformation zone'.	Table 9. The GDG considered this carefully and were of the view that once term was reached that women with this history may seek to be admitted to a MLU.

Table R: Previous PPH, not requiring blood transfusion or surgical intervention (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014a), UK	Clinical Guideline 190	PPH	'Advise women with increased risk of the previous complication of primary postpartum haemorrhage <i>requiring additional treatment or blood transfusion</i> suggest planning to birth in an obstetric unit.'	Table 7. The GDG considered this carefully and agreed that women with a previous PPH, not requiring blood transfusion or surgical intervention may plan to birth in AMU only.

Table S: Prostaglandin induction resulting in the onset of labour (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
Thomas et al, (2014), UK	Cochrane Review	Prostaglandin Induction resulting in the onset of labour	'Prostaglandins increase the chance of cervical change with no increase in operative delivery rates'.	P. 2 The GDG considered the evidence and carefully worded this criteria to include women who have gone into labour following prostaglandin induction and choose to be admitted to an AMU.

Table T: Group B Streptococcus positive in this pregnancy with no signs of infection (AMU)

Author/ Date/Country	Type of Evidence	Criteria	Results/Findings	Comment/Reference
NICE (2014c), UK	Clinical Guideline 62	Group B Streptococcus	'Pregnant women should not be offered routine antenatal screening for group B streptococcus because evidence of its clinical and cost effectiveness remains uncertain'.	Section 1.8.9
Ohlsson (2014), Canada	Cochrane Systematic Review		'There is lack of evidence from well designed and conducted trials to recommend Intrapartum Antibiotic Prophylaxis (IAP) to reduce neonatal Early Onset Group B Streptococcus Disease (EOGOSD)'.	P.2 PLEASE NOTE:
RCOG (2012), UK	Green-Top Guideline		Antenatal prophylaxis with oral benzylpenicillin for vaginal/rectal colonisation does not reduce the likelihood of GBS colonisation at the time of delivery and so is not indicated in this situation. IAP should be offered to GBS-colonised women. IAP should be offered if GBS is detected on a vaginal swab in the current pregnancy. Vaginal swabs should not be taken during pregnancy unless there is a clinical indication to do so. If GBS is present in a vaginal swab, it is likely that the risk of neonatal disease is increased. A risk of disease of 2.3/1000 may be assumed (overall UK incidence 0.5/1000; approximately 21% women are carriers).	Normal Practice in NI is to administer IAP as per recommendations of GAIN (2013)

References

1. Ali, A Glennon K, Kirkham C, Yousif S, Eogan M (2014) Delivery outcomes and events in subsequent pregnancies after previous anal sphincter injury *European Journal of Obstetrics & Gynecology and Reproductive Biology* 174 (2014) 51–53 (**Anal sphincter injury**)
2. Arendas K, Qiu Q, Gruslin A. Obesity in pregnancy: preconceptional to postpartum consequences. *Journal of Obstetrics & Gynaecology Canada* 2008;30:477–88 (**BMI**).
3. Aune D, Didrik Saugstad, O, Henriksen T, Tonstad S. Maternal body mass index and the risk of fetal death, stillbirth, and infant mortality: a systematic review and meta-analysis. *JAMA*. doi:10.1001/jama.2014.2269 (**BMI**)
4. Confidential Enquiry into Maternal and Child Health (CEMACH). *Perinatal Mortality 2007: United Kingdom*. CEMACH: London, 2009
<http://www.cmace.org.uk/getattachment/1d2c0ebc-d2aa-4131-98ed-56bf8269e529/PerinatalMortality-2007.aspx> (**Age**)
5. Devane, D; Brennan, M; Begley, C; Clarke, M; Walsh, D; Sandall, J; Ryan, P; Reville, P & Normand, C (2010) *A systematic review, meta-analysis, meta-synthesis and economic analysis of midwife-led models of care*. Royal College of Midwives: London (**Social factors**)
6. DHSSPSNI (2013) *Enhancing Healthcare Services for Children and Young People in Northern Ireland (From Birth to 18 Years) A review of paediatric healthcare services in hospital and the Community* DHSSPSNI: Belfast (**Age**)
7. Edozien LC, Gurol-Urganci I, Cromwell DA, Adams EJ, Richmond DH, Mahmood TA, van der Meulen JH. (2014) Impact of third- and fourth-degree perineal tears at first birth on subsequent pregnancy outcomes: a cohort study. *BJOG* 2014; DOI: 10.1111/1471-0528.12886 (**Third & fourth degree perineal tears**)
8. El-Chaar, D, Yang, Q, Gao, J. Bottomley, J, Leader A. Wen, Shi Wu, Walker, M (2009) Fertility and Sterility Risk of birth defects increased in pregnancies conceived by assisted human reproduction 92 (5):1557-61 (**Assisted Conception**)

9. Fretts RC. Etiology and prevention of stillbirth. *American Journal of Obstetrics & Gynecology* 2005;193:1923–35 (Age & BMI)
10. Froen JF, Arnestad M, Frey K, Vege A, Saugstad OD, StrayPedersen B. Risk factors for sudden intrauterine unexplained death: epidemiologic characteristics of singleton cases in Oslo, Norway, 1986-1995. *Am J Obstet Gynecol* 2001;184:694-702 (Age & BMI)
11. Guidelines and Audit Implementation Network (GAIN) (2013) Prevention of Early Onset Group B Streptococcal Disease – Northern Ireland Audit Report 2013 FINAL REPORT (Strep B)
12. GAIN (2014) *Advice for guideline development in Northern Ireland manual* GAIN: Belfast
13. GAIN (2016) Guideline for Admission to Midwife-Led Units in Northern Ireland and Northern Ireland Normal Labour & Birth Care Pathway. *Guidelines and Audit Implementation Network - GAIN* [Online] Available at: https://rqia.org.uk/getattachment/3a7a37bb-d601-4daf-a902-6b60e5fa58c2/GAIN_MLU_Guideline.pdf.aspx.
14. Healy DL, Breheny S, Halliday J, Jaques A, Rushford D, Garrett C, et al. Prevalence and risk factors for obstetric haemorrhage in 6730 singleton births after assisted reproductive technology in Victoria Australia. *Human Reproduction* 2010; 25: 265–74 (Assisted Conception)
15. Hodnett ED, Downe S , Walsh D, Weston J. A lternative versus conventional institutional settings for birth. *Cochrane Database of Systematic Reviews* 2010, Issue 9. Art. No.: CD000012. DOI: 10.1002/14651858.CD000012.pub3 (Social factors)
16. Hollowell, JA, Pillas, D, Rowe, R, Linsell, L, Knight, M and Brocklehurst, P. (2013) The impact of maternal obesity on intrapartum outcomes in otherwise low risk women: secondary analysis of the Birthplace national prospective cohort study. *British Journal of Obstetrics and Gynaecology*, September (BMI)
17. Huang DY, Usher RH, Kramer MS, Yang H, Morin L, Fretts RC. Determinants of unexplained antepartum fetal deaths. *Obstet Gynecol* 2000;95:215-21.(Age & BMI)

18. HSC PHA (2012) Integrated Perinatal Mental Health Care Pathway Belfast: HSC PHA
(Maternal Mental Health)
19. Kristensen J, Vestergaard M, Wisborg K, Kesmodel U, Secher NJ. Pre-pregnancy weight and the risk of stillbirth and neonatal death. *BJOG* 2005;112:403–8 (BMI)
20. Lawrence A, Lewis L, Hofmeyr GJ, Styles C. Maternal positions and mobility during first stage labour. *Cochrane Database of Systematic Reviews* 2013, Issue 10. Art. No.: CD003934. DOI: 10.1002/14651858.CD003934.pub4 (Mobility)
21. Manktelow BM, Smith LK, Evans TA, Hyman-Taylor P, Kurinczuk JJ, Field DJ, Smith PW, Draper ES, on behalf of the MBRRACE-UK collaboration. Perinatal Mortality Surveillance Report UK Perinatal Deaths for births from January to December 2013. Leicester: The Infant Mortality and Morbidity Group, Department of Health Sciences, University of Leicester. 2015. (Age & Social Deprivation)
22. National Institute of Clinical Excellence (NICE) (2010) Public Health Guidance 27, July 2010, *Weight management before, during and after pregnancy*, London,
<http://www.nice.org.uk/guidance/PH27> (BMI)
23. National Institute of Clinical Excellence (2010), CG 110 *Pregnancy and complex social factors: a model for service provision for pregnant women with complex social factors*
<https://www.nice.org.uk/guidance/cg110/chapter/1-Guidance> (Social Factors)
24. National Institute of Clinical excellence (NICE) (2012) CG 149 Antibiotics for early-onset neonatal infection: antibiotics for the prevention and treatment of early- onset neonatal infection London: NICE <https://www.nice.org.uk/guidance/cg149/chapter/research-recommendations> (Strep B)
25. National Institute of Clinical Excellence (NICE) (2014a) Clinical Guideline 190 Intrapartum care: care of the healthy woman and their babies during childbirth
<http://www.nice.org.uk/guidance/cg190/resources/guidance-intrapartum-care-care-of-healthy-women-and-their-babies-during-childbirth-pdf> (Age, BMI, PPH, Maternal Haemoglobin, Meconium, 4 Previous births, SROM, Threatened Miscarriage, Threatened Preterm labour, Medical Condition, Previous Stillbirth, Cervical or Perineal Trauma, Serum antibodies)

26. National Institute of Clinical Excellence (NICE) (2014b) Clinical guideline 192, December 2014 Antenatal and postnatal mental health: clinical management and service guidance London <https://www.nice.org.uk/guidance/cg192> (Maternal Mental Health)
27. National Institute of Clinical Excellence (NICE) (2008, Modified 2014c) Clinical Guideline 62, March 2008, modified 2014, *Antenatal Care*, London: NICE
<http://www.nice.org.uk/guidance/cg62/resources/guidance-antenatal-care-pdf> (Age, BMI, Social Deprivation & Strep B, Suspected low-lying placenta, Prostaglandin Induction)
28. Oakley L, Maconochie N, Doyle P, Dattani N, Moser K. Multivariate analysis of infant death in England and Wales in 2005-06, with focus on socio-economic status and deprivation. *Health statistics quarterly / Office for National Statistics* 2009; 42:22-39. (Social Deprivation)
29. Okun, N and Sierra, S. (2014) Pregnancy outcomes after assisted Human Reproduction *Journal of obstetrics & Gynaecology Canada* 36(1): 6483 (Assisted Conception)
30. Ohlsson A, Shah VS. Intrapartum antibiotics for known maternal Group B streptococcal colonization. *Cochrane Database of Systematic Reviews* 2014, Issue 6. Art. No.: CD007467. DOI: 10.1002/14651858.CD007467.pub4 (Group B Strep)
31. Reddy UM, Wapner RJ, Rebar RW, Tasca RJ. Infertility, assisted reproductive technology, and adverse pregnancy outcomes: executive summary of a National Institute of Child Health and Human Development workshop. *Obstetrics and Gynecology* 2007;109: 967–77. 70. (Assisted Conception)
32. Regulation and Quality Improvement Authority (RQIA) (2012) Baseline Assessment of the Care of Children Under 18 Admitted to Adult Wards in Northern Ireland Belfast: RQIA Accessed on 12 June 2015
<https://www.rqia.org.uk/getattachment/04aed398-20e6-430c-8b32-46f8bf52708a/Under-18s-on-Adult-Hosp-Wards-Overview-Report-Web-12-Dec-12-ISBN.pdf.aspx> (Age)
33. Renfrew, M; McFadden, A; Helena Bastos, M; Campbell, J; Amos Channon, A; Fen Cheung, N; Delage Silva, D.R.A; Downe, S; Powell Kennedy, H; Malata, A; McCormick, F; Wick, L & Declercq, E. (2014) Midwifery and quality care: findings from a new

evidence-informed framework for maternal and newborn care. *The Lancet*, 384, 9948, p1129-1145 (Accessed 17 August 2015) (Social Factors)

34. Royal College of Obstetricians and Gynecologists (RCOG) (2010) Late Intrauterine & Fetal Death & Stillbirth (Green-Top Guideline No 55) London: RCOG (Unexplained Stillbirth)
35. Royal College of Obstetricians and Gynaecologists (2011). *Management of Women with Mental Health Issues during Pregnancy and the Postnatal Period*. Good Practice No. 14. London: RCOG (Maternal Mental Health)
36. Royal College of Obstetricians and Gynecologists (RCOG) 2012 Green –Top Guideline No 26 The Prevention of Early Onset Group B Streptococcal Disease 2nd Edition July London: RCOG (Strep B)
37. Royal College of Obstetricians and Gynaecologists (2012) Bacteria Sepsis in Pregnancy Green Top Guideline No 64a London: RCOG (Strep B)
38. Royal College of Obstetricians and Gynecologists 2012 'In Vitro Fertilisation: Perinatal Risks and Early Childhood Outcomes' Scientific Impact Paper No. 8 May London: RCOG (IVF)
39. Sandall J. (2010) The contribution of continuity of midwifery care to high quality maternity care London: Royal College of Midwives
<https://www.rcm.org.uk/sites/default/files/Continuity%20of%20Care%20A5%20Web.pdf>
(Social factors)
40. Sandall, J; Soltani, H; Gates, S; Shennan, A; Devane, D; (2013) *Midwife-led continuity models versus other models of care for childbearing women*. *Cochrane Database Systematic Review*; 8: CD004667 (Social factors)

41. Smith LK, Draper ES, Manktelow BN, Dorling JS, Field DJ. Socioeconomic inequalities in very preterm birth rates. *Archives of Disease in Childhood Fetal & Neonatal Edition*. 2007; 92(1):F11-F4 (Social Deprivation)
42. South Eastern Health & Social Care Trust (2013) Integrated Perinatal Mental Health Care Pathway Belfast: South Eastern Health & Social Care Trust (Maternal Mental Health)
43. Thomas J, Fairclough A, Kavanagh J, Kelly AJ. Vaginal prostaglandin (PGE2 and PGF2a) for induction of labour at term
44. *Cochrane Database of Systematic Reviews* 2014, Issue 6. Art. No.: CD003101. DOI: 10.1002/14651858.CD003101.pub3 (Prostaglandin induction)
45. Tracy, S.K; Hartz, D; Nicholl, M; McCann, Y; Latta, D (2005) *An integrated service network in maternity - the implementation of a midwifery-led unit* *Australian Health Review* 2005: 29(3): 332–339 (Social Factors)
46. Tracy, S.K; Hartz, D.L; Tracy, M.B; Allen, J.; Forti, A; Hall, B; White, J; Lainchbury, A; Stapleton, H; Beckmann, M; Bisits, A; Homer, C; Foureur, M; Welsh & A; Kildea, S (2013) *Caseload midwifery care versus standard maternity care for women of any risk: M@NGO, a randomised controlled trial*. *The Lancet* published online Sept 17 (Social Factors)
[http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(13\)61406-3/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(13)61406-3/abstract)
47. Wiggins DA, Main E. (2005) Outcomes of pregnancies achieved by donor egg in vitro fertilization—A comparison with standard in vitro fertilization pregnancies *American Journal of Obstetrics and Gynecology* 192 (6) 2002–2006 (Donor Egg & IVF).