NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

QUALITY STANDARDS PROGRAMME

Quality standard topic: Multiple pregnancy

Output: Full briefing paper

Introduction

This briefing paper presents a structured evidence review to help determine the suitability of recommendations from the key development sources listed below, to be developed into a NICE quality standard. The draft quality statements and measures presented in this paper are based on published recommendations from these key development sources:

Multiple pregnancy: the management of twin and triplet pregnancies in the antenatal period. NICE clinical guideline 129 (2011; NHS Evidence accredited).

Structure of the briefing paper

The body of the paper presents supporting evidence for the draft quality standard reviewed against the three dimensions of quality: clinical effectiveness, patient experience and safety. Information is also provided on available cost-effectiveness evidence and current clinical practice for the proposed standard. Where possible, evidence from the clinical guideline is presented. When this is not available, other evidence sources have been used.

1 Determining gestational age and chorionicity

1.1 NICE CG129 Recommendation 1.1.2.1 [KPI]

1.1.1 Relevant NICE clinical guideline recommendations and proposed quality statement

Guideline recommendations	1.1.2.1 (KPI) Determine chorionicity at the time of detecting twin and triplet pregnancies by ultrasound using the number of placental masses, the lambda or T-sign and membrane thickness.
Proposed quality statement	Women with a multiple pregnancy have the chorionicity of their pregnancy determined using ultrasound by 13 weeks 6 days.
Draft quality measure	**Structure:** Evidence of local arrangements to ensure that women with a multiple pregnancy undergo an ultrasound scan to determine the chorionicity of their pregnancy by 13 weeks 6 days. **Process:** The proportion of women with a multiple pregnancy who receive an ultrasound to determine the chorionicity of their pregnancy by 13 weeks and 6 days. Numerator – The number of women in the denominator receiving an ultrasound to determine the chorionicity of their pregnancy by 13 weeks and 6 days. Denominator – The number of women with a multiple pregnancy. **Outcome:** Chorionicity of multiple pregnancies correctly determined.
Definitions	**Chorionicity:** The number of chorionic membranes that surround the fetuses in a multiple pregnancy. If there is only one chorionic membrane the pregnancy is described as monochorionic; if there are two, the pregnancy is described as dichorionic; and if there are three, the pregnancy is described as trichorionic. Monochorionic twin pregnancies and dichorionic and monochorionic triplet pregnancies carry higher risks because fetuses share a placenta. **Ultrasound scan** to determine chorionicity uses the number of placental masses, the lambda or T-sign and membrane thickness **Lambda:** In a diamniotic pregnancy, the ultrasound appearance of the dividing membrane (comprising two amnions and two chorions) where it is attached to the uterine wall. **T sign:** In a monochorionic pregnancy, the ultrasound appearance of the dividing membrane (comprising two

	amnions) where it is attached to the uterine wall.
Discussion points for TEG	Which aspect improves quality? Is nomenclature usually recorded at this scan? Should a statement be included on nomenclature?

1.1.2 Clinical and cost-effectiveness evidence

Determination of chorionicity is required to correctly stratify perinatal risk according to the type of twin or triplet pregnancy. Pregnancy risks, clinical management and subsequent outcomes are very different for monochorionic and dichorionic twin pregnancies (and monochorionic, dichorionic and trichorionic triplet pregnancies), accurately determining chorionicity is very important.

The GDG recognised there are a number of different methods used to determine chorionicity by ultrasound and timing within the UK. Evidence was identified for a variety of methods used to determine chorionicity from ultrasound scans in twin and triplet pregnancies.

On the basis of the reviewed evidence, the GDG concluded that if a twin or triplet pregnancy is diagnosed before 11 weeks of gestation, determining chorionicity immediately using a composite of the number of placental masses, the presence of a lambda or T-sign and membrane thickness is as effective as waiting for the 11 weeks 0 days to 13 weeks 6 days scan. There is no evidence that the use of three-dimensional scans improves the accuracy of chorionicity determination. The GDG concluded that from a practical point of view it makes sense to perform estimation of gestational age, chorionicity and fetal trisomy screening at the same first-trimester ultrasound scan and the best interval for all three is 11 weeks 0 days to 13 weeks 6 days.

Only one study reported on diagnosing chorionicity in triplet pregnancies and this study evaluated only one method. The GDG assumed that the diagnostic accuracy of methods for determining chorionicity were similar for twin and triplet pregnancies.

1.1.3 Patient experience

No relevant patient experience information was identified.

1.1.4 Patient safety

No issues identified relating specifically to determining chorionicity (see full accompanying report from the NPSA for broader themes).

1.1.5 Current practice

No relevant current practice information identified.

1.1.6 Current indicators

The maternity services secondary users dataset will collect data on a range of relevant mandatory and relevant data items, once implemented, including the following:

- Offer status - dating ultrasound scan (global number 17201960).
- Number of fetuses – dating ultrasound scan (global number 17202020).
- Abnormality detected - dating ultrasound scan (global number 17210250).
- Fetal order - ultrasound fetal anomaly screening (global number 17210330).

2 Care planning

2.1 NICE CG129 Recommendation 1.1.2.11 [KPI]

2.1.1 Relevant NICE clinical guideline recommendations and proposed quality statement

Guideline recommendations	1.1.2.11 (KPI) Networks should agree care pathways for managing all twin and triplet pregnancies to ensure that each woman has a care plan in place that is appropriate for the chorionicity of her pregnancy.
Proposed quality statement	Women with a multiple pregnancy have a personalised care plan that is appropriate for the chorionicity of her pregnancy.
Draft quality measure	**Structure:** Evidence of local arrangements to ensure that women with a multiple pregnancy have a personalised care plan which takes into account their chorionicity. **Process:** The proportion of women with a multiple pregnancy who receive a personalised care plan appropriate to their chorionicity. Numerator – The number of women in the denominator who receive a personalised care plan appropriate to their chorionicity. Denominator – The number of women with a multiple pregnancy. **Outcome:** Number of antenatal appointments received appropriate for the chorionicity of the pregnancy, including contacts with the core team.
Definitions	A care plan which takes into account the chorionicity of the pregnancy would specify the following schedule of appointments:

Type of pregnancy (uncomplicated)	Minimum contacts with core multidisciplinary team	Timing of appointments PLUS scans	Additional appointments WITHOUT scans
Monochorionic diamniotic twins	9 (including 2 with specialist obstetrician)	Approximately 11 weeks 0 days to 13 weeks 6 days* and 16, 18, 20, 22, 24, 28, 32 and 34 weeks	–
Dichorionic twins	8 (including 2 with specialist obstetrician)	Approximately 11 weeks 0 days to 13 weeks 6 days* and 20, 24, 28, 32 and 36 weeks	16 and 34 weeks
Monochorionic triamniotic triplets and dichorionic triamniotic triplets	11 (including 2 with specialist obstetrician)	Approximately 11 weeks 0 days to 13 weeks 6 days* and 16, 18, 20, 22, 24, 26, 28, 30, 32 and 34 weeks	–
Trichorionic triamniotic triplets	7 (including 2 with specialist obstetrician)	Approximately 11 weeks 0 days to 13 weeks 6 days* and 20, 24, 28, 32 and 34 weeks	16 weeks
* When crown–rump length measures from 45 mm to 84 mm			

Discussion points for TEG	In determining the chorionicity (statement 1 above) will they subsequently get a personalised care plan? What is the quality aspect for the care plan?

2.1.2 Clinical and cost-effectiveness evidence

The scope of the guideline required the GDG to specify the schedule for antenatal appointments for women with twin and triplet pregnancies and its recommendations were based on consideration of the available evidence and pragmatism, seeking to avoid the need for women to attend several different appointments when visits for different purposes could be combined into a single appointment. The GDG recognised that women with triplet pregnancies

tend to give birth even earlier than women with twin pregnancies, and so the recommended number of appointments for women with triplet pregnancies is less than for women with twin pregnancies (but apart from this, they would receive care similar to that received by women with monochorionic twin pregnancies).

The GDG found there is potential for a positive effect of continuity of care, including establishing rapport through repeated contact with the same healthcare professionals throughout pregnancy.

The guideline development group came to a consensus opinion on the number of contacts a woman should have with the core team taking into account to the chorionicity of her pregnancy. The guideline development group's consensus view was that at least two appointments should be with the specialist obstetrician (regardless of the chorionicity of the pregnancy). The purpose of these appointments is to assess and discuss the risks associated with the individual pregnancy, and to discuss timing and mode of birth.

2.1.3 Patient experience

No relevant patient experience information was identified.

2.1.4 Patient safety

No patient safety evidence was identified (see full report from the patient safety function at the NHS Commissioning Board for broader themes).

2.1.5 Current practice

A report into the maternity care for women having a multiple birth by the National Perinatal Epidemiology Unit in 2011 found women with a multiple pregnancy had an average of 13 antenatal checks compared with 9 for women with a singleton pregnancy. They were twice as likely to have between 15 and 19 checks and 6% had 20 or more antenatal checks. Women with a multiple pregnancy also had more ultrasound scans. Women with a singleton pregnancy had an average of 3 scans, for multiple pregnancies the average was 8 scans and women expecting triplets on average 9 scans. It was found that 59% of women with a multiple pregnancy had 7 or more scans.

2.1.6 Current indicators

No relevant current indicators were identified.

3 The composition of the core team

3.1 NICE CG129 Recommendation 1.2.3.1 [KPI]

3.1.1 Relevant NICE clinical guideline recommendations and proposed quality statement

Guideline recommendations	1.2.3.1 (KPI) Clinical care for women with twin and triplet pregnancies should be provided by a nominated multidisciplinary team consisting of: a core team of named specialist obstetricians, specialist midwives and ultrasonographers, all of whom have experience and knowledge of managing twin and triplet pregnancies an enhanced team for referrals, which should include: • a perinatal mental health professional • a women's health physiotherapist • an infant feeding specialist • a dietitian. Members of the enhanced team should have experience and knowledge relevant to twin and triplet pregnancies. 1.2.3.4 (KPI) The core team should offer information and emotional support specific to twin and triplet pregnancies at their first contact with the woman and provide ongoing opportunities for further discussion and advice including: • antenatal and postnatal mental health and wellbeing • antenatal nutrition (see 1.2.2.1) • the risks, symptoms and signs of preterm labour and the potential need for corticosteroids for fetal lung maturation • likely timing and possible modes of delivery • breastfeeding • parenting
Proposed quality statement	Women with a multiple pregnancy are seen for all of their antenatal appointments with a member of the multidisciplinary core team following confirmation of multiple pregnancy.
Draft quality measure	**Structure:** Evidence of local arrangements to ensure that women are seen for all their antenatal appointments with a member of the multidisciplinary core team following confirmation of multiple pregnancy. **Process:** The proportion of women that are seen for all their antenatal appointments with a member of the multidisciplinary core team following confirmation of multiple pregnancy. Numerator – The number of women in the denominator who are seen for all their antenatal appointments with a member of

	the multidisciplinary core team following confirmation of multiple pregnancy. Denominator – The number of women with a confirmed multiple pregnancy **Outcome:**
Definitions	A multidisciplinary core team of named specialists includes named specialist obstetricians, specialist midwives and ultrasonographers, all of whom have experience and knowledge of managing twin and triplet pregnancies. Specialist Obstetrician: An obstetrician with a special interest, experience and knowledge of managing multiple pregnancies, and who works regularly with women with multiple pregnancies. Specialist Midwife: A midwife with a special interest, experience and knowledge of managing multiple pregnancies, and who works regularly with women with multiple pregnancies All antenatal appointments: First booking appointment is not included as unless the women is already aware that she has a multiple pregnancy this appointment will be as in routine ANC. The core team should offer information and emotional support specific to twin and triplet pregnancies at their first contact with the woman and provide ongoing opportunities for further discussion and advice including: • antenatal and postnatal mental health and wellbeing • antenatal nutrition • the risks, symptoms and signs of preterm labour and the potential need for corticosteroids for fetal lung maturation • likely timing and possible modes of delivery • breastfeeding • parenting
Discussion points for TEG	If women get access to the core team will the enhanced team and recommendation 1.2.3.4 follow? Should we expand healthcare professional's definition to include Fetal medicine specialist – the guideline just refers to specialist obstetrician?

3.1.2 Clinical and cost-effectiveness evidence

There was no evidence reported from randomised controlled trials for the effectiveness of specialised antenatal care for twin and triplet pregnancies. In addition, the studies were all undertaken in the USA where some aspects of the healthcare system, including accessibility, may limit their applicability to the UK setting.

Evidence considered by the GDG was reported in relation to the effectiveness of specialist antenatal care for improving maternal morbidity and perinatal and neonatal morbidity and mortality (including reduction in preterm birth rates). None of the studies included triplet pregnancies. The GDG concluded that there was a reduction in preterm birth rates for women who received specialist antenatal care. Specialist care was also found to lead to an improvement in maternal morbidity and perinatal and neonatal morbidity and mortality.

The GDG determined that care should be delivered by a nominated multidisciplinary specialist team as there was evidence that continuity and consistency of care by the same healthcare professionals throughout pregnancy contributed to improved outcomes. The group reached a consensus opinion as to the model of care that should be provided by a specialist team based on their knowledge and experience of existing teams.

3.1.3 Patient experience

The TAMBA Health and Lifestyle survey (2011) found 40% of parents said the care they received from their hospital consultants was “very good”. Only 1 in 10 parents (11%) thought the advice given by their consultant was poor or very poor. It was found that this low rating typically referred to poor advice on monochorionic twins. The survey found with 1 in 4 (27%) parents believed midwives’ advice to be very good and levels of dissatisfaction were low (16% rated poor or very poor). The highest levels of satisfaction reported by parents were for hospitals with specialised midwife expertise.

The 2011 Department of Health report, Parents' views on the maternity journey and early parenthood, identified that strong communicative relationships with healthcare professionals are key to ensuring expectant parents feel satisfied, well informed and supported in making decisions. It also found that continuity of care involving one midwife or a small team of professionals was most likely to achieve this.

3.1.4 Patient safety

No patient safety evidence was identified (see full report from the patient safety function at the NHS Commissioning Board for broader themes).There is limited evidence of women with multiple pregnancies from vulnerable groups, such as homeless and ethnic minorities failing to attend antenatal appointments.

3.1.5 Current practice

Twin and triplet pregnancies are associated with higher risks of maternal, fetal and neonatal complications which may lead to short- or long-term morbidity or

mortality. Since these risks are communicated to women with twin or triplet pregnancies and their families, such pregnancies may be associated with significant psychosocial and economic consequences for the women and their partners. Delivery of antenatal care in such pregnancies may, therefore, require specific modification over and above routine care to reduce the risks and manage concerns or complications appropriately, should they arise. There is currently a wide variation in how obstetric and midwifery care is provided for women with twin and triplet pregnancies.

The current availability of equipment and healthcare professionals responsible for care of twin and triplet pregnancies at different hospitals varies greatly depending on the size and location of the hospital. Implementing specialist care could be resource heavy if it requires establishing a specific team and equipment in all centres.

The Department of Health report, Parents' views on the maternity journey and early parenthood (2011), found that healthcare professionals valued continuity of care. Healthcare professionals felt it gave more efficient use of resources, a more rewarding professional role and a more supported experience for women and their partners.

The 2009 TAMBA multiple failings survey found a lack of continuity in antenatal care was common problem and some mothers saw a different health professional at each appointment. Concerns were also raised about the lack of expertise on multiple births. Parents often received confusing or mixed messages from health professionals, particularly about twin-to-twin transfusion syndrome.

The report into the maternity care for women having a multiple birth by the National Perinatal Epidemiology Unit found women with a multiple pregnancy were much less likely to have midwife only care and were twice likely as mothers of singletons to see an obstetrician or other hospital doctor during their pregnancy.

3.1.6 Current indicators

No relevant current indicators were identified.

4 Monitoring for fetal complications

4.1 NICE CG129 Recommendation 1.3.5.2 [KPI], 1.3.4.2, and 1.3.4.3

4.1.1 Relevant NICE clinical guideline recommendations and proposed quality statement

Guideline recommendations	1.3.4.2. Start diagnostic monitoring with ultrasound for feto-fetal transfusion syndrome (including to identify membrane folding) from 16 weeks. Repeat monitoring fortnightly until 24 weeks. 1.3.4.3. Carry out weekly monitoring of twin and triplet pregnancies with membrane folding or other possible early signs of feto-fetal transfusion syndrome (specifically, pregnancies with intertwin membrane infolding and amniotic fluid discordance) to allow time to intervene if needed. 1.3.5.2 (KPI) Estimate fetal weight discordance using two or more biometric parameters at each ultrasound scan from 20 weeks. Aim to undertake scans at intervals of less than 28 days. Consider a 25% or greater difference in size between twins or triplets as a clinically important indicator of intrauterine growth restriction and offer referral to a tertiary level fetal medicine centre.
Proposed quality statement	Women with a multiple pregnancy are monitored for fetal complications according to the chorionicity of their pregnancy.
Draft quality measure	**Structure:** Evidence of local arrangements to ensure that women with a multiple pregnancy are monitored for fetal complications according to the chorionicity of their pregnancy. **Process:** a) Women with a monochorionic pregnancy receive initial diagnostic monitoring with ultrasound for feto-fetal transfusion syndrome from 16 weeks and repeat monitoring fortnightly until 24 weeks. Numerator – The number of women in the denominator who receive initial diagnostic monitoring with ultrasound for feto-fetal transfusion syndrome from 16 weeks which is repeated fortnightly until 24 weeks. Denominator – The number of women with a monochorionic multiple pregnancy. b) Women identified as having early signs of feto-fetal transfusion syndrome receive weekly monitoring by ultrasound. Numerator – The number of women in the denominator identified as having early signs of feto-fetal transfusion syndrome who undergo weekly monitoring by ultrasound. Denominator –The number of women with a multiple pregnancy and early signs of feto-fetal transfusion

	syndrome c) Fetal weight discordance is estimated using two or more biometric parameters at each ultrasound scan from 20 weeks. Numerator – The number of women in the denominator who have fetal weight discordance estimated using two or more biometric parameters at each ultrasound scan from 20 weeks. Denominator – The number of people with a multiple pregnancy **Outcome:** Fetal complications are identified and monitored.
Definitions	**Intrauterine growth restriction:** A 25% or more difference in size between twins or triplets is a clinically significant indicator of intrauterine growth restriction. In clinical practice any degree of fetal growth restriction or discordance of less than 25% would lead to increased fetal surveillance **Feto-fetal transfusion syndrome (FFTS):** Feto-fetal transfusion syndrome is a complication of monochorionic multiple pregnancies arising from shared placental circulation. It is also referred to as twin-to-twin transfusion syndrome in twin pregnancies. It occurs because of the shared blood vessels in the placenta and the flow of blood from one baby to the other becomes unbalanced. The fetus with less blood is referred to as the donor and the fetus with too much blood is called the recipient. **Biometric parameters:** A measure of certain aspects of an individual's anatomy or physiology (for example height or weight)
Discussion points for TEG	Are FFTS and IUGR the only fetal complications we are referencing? This is linked to care plans. Can we reduce the number of process measures?

4.1.2 Clinical and cost-effectiveness evidence

The GDG found there was insufficient evidence to support screening for FFTS syndrome in the first trimester. No evidence was identified that examined the value of ultrasound features commonly used in clinical practice, such as femur length, abdominal circumference, estimated fetal weight, placental anastomoses, tricuspid regurgitations or absent visualisation of donor bladder to predict FFTS.

There was evidence to support the ultrasound examination of membrane folding to predict FFTS in a monochorionic twin pregnancy. The GDG concluded the best chance of identifying FFTS was through the use of ultrasound assessment looking for features such as membrane folding, absence of bladder, abnormal umbilical artery Doppler recording or discordance of inter-twin amniotic volume. They also determined that fetal abdominal circumference or estimated weight can also be used to identify FFTS. The GDG determined that these assessments should be undertaken weekly due to the speed of development of FFTS. Although no evidence was identified in relation to triplet pregnancies the group decided the recommendations for triplet pregnancies should be the same as those for twin pregnancies.

The GDG considered evidence that showed that estimated fetal weight is a moderately useful predictor of IUGR, the evidence showed that the best cut-off for intertwin birth weight discordance is an estimated fetal weight difference of 25%. The evidence showed that the best estimate of fetal weight is derived when applying a formula that incorporates at least two fetal biometric parameters. It was found that the best predictor of IUGR or discordance between twins is an ultrasound scan carried out within 28 days of birth.

Routine scanning for IUGR is recommended in ‘Antenatal care’ (NICE clinical guideline 62) and was found to be cost effective. However, in twin and triplet pregnancies there is a need for additional scanning, and this may increase the number of scans required from two to eight, depending on the chorionicity of the pregnancy, costing an additional £200. Although there is an additional resource implication from the increased monitoring recommended early in the second trimester, the GDG was aware that the majority of units already undertake these additional scans in monochorionic twin pregnancies. The group also determined that as there is no clear benefit in screening for FFTS in the first trimester, there may be a resource saving from reduced scanning time and unnecessary referral for FFTS.

4.1.3 Patient experience

No relevant patient experience was identified.

4.1.4 Patient safety

No patient safety evidence was identified (see full report from the patient safety function at the NHS Commissioning Board for broader themes).

4.1.5 Current practice

NICE clinical guideline 129 concluded about 20–25% of twin pregnancies are monochorionic and about 10–15% of monochorionic twin pregnancies are

complicated by feto-fetal transfusion syndrome (FFTS) due to unequal placental sharing. This morbid condition may also affect monochorionic and dichorionic triplet pregnancies. Outcomes associated with this chronic condition are very poor, with 60–90% of pregnancies resulting in stillbirth, neonatal death or disability. However, timely diagnosis, staging and fetoscopic laser ablation significantly improve perinatal outcomes, resulting in rates of 70–85% for being able to take at least one baby home with a low incidence of poor neurodevelopmental outcomes.

The 2009 perinatal mortality survey by the Centre for Maternal and Child Enquiries found that specific fetal conditions (21%) and major congenital anomalies (11%) were more common primary causes of stillbirth in twins compared to singletons. Specific fetal conditions including twin to twin transfusion syndrome were a major cause of stillbirth in twins (18% of all twin births).

4.1.6 Current indicators

The Health and Social Care Information Centre (2011) Maternity Statistics – 2010-2011

- Singleton and multiple birth deliveries by birth weight and birth status, 2010-11 (Table 28)

- Median birth weight (grams) of live born singleton and multiple deliveries by gestation length (Table 30).

5 Indications for seeking a consultant opinion

5.1 NICE CG129 Recommendation 1.6.1.1 [KPI]

5.1.1 Relevant NICE clinical guideline recommendations and proposed quality statement

Guideline recommendations	1.6.1.1. Seek a consultant opinion from a tertiary level fetal medicine centre for: • monochorionic monoamniotic twin pregnancies • monochorionic monoamniotic triplet pregnancies • monochorionic diamniotic triplet pregnancies • dichorionic diamniotic triplet pregnancies • pregnancies complicated by any of the following: • discordant fetal growth • fetal anomaly • discordant fetal death • feto-fetal transfusion syndrome.
Proposed quality statement	Women with a multiple pregnancy are referred for a consultant opinion at a tertiary level fetal medicine centre if their pregnancy is determined to be high risk at any time during their pregnancy.
Draft quality measure	**Structure:** Evidence of local arrangements to ensure that women with a multiple pregnancy are referred for a consultant opinion at a tertiary level fetal medicine centre if their pregnancy is determined to be high risk at any time during their pregnancy. **Process:** The proportion of women with a multiple pregnancy who are referred for a consultant opinion at a tertiary level fetal medicine centre if their pregnancy is determined to be high risk at any time during their pregnancy. Numerator – The number of women in the denominator referred to a tertiary level fetal medicine centre for a consultant opinion. Denominator – The number of women with a multiple pregnancy whose pregnancy is determined to be high risk at any time during their pregnancy. **Outcome:** Infant and maternal mortality and morbidity.
Definitions	High risk pregnancy is defined as the following; • monochorionic monoamniotic twin pregnancies • monochorionic monoamniotic triplet pregnancies

	• monochorionic diamniotic triplet pregnancies • dichorionic diamniotic triplet pregnancies • pregnancies complicated by any of the following: • discordant fetal growth • fetal anomaly • discordant fetal death • feto-fetal transfusion syndrome.
Discussion points for TEG	Include 'opinion at tertiary level centre' within statement? Is there a specific aspect of the referral for a consultant opinion we should focus on?

5.1.2 Clinical and cost-effectiveness evidence

Monochorionic, monoamniotic pregnancies were recognised by the GDG as requiring special consideration. All pregnancies complicated by FFTS were identified in the guideline scope as requiring referral to tertiary level fetal medicine centres. IUGR is associated with increased perinatal loss and morbidity, it can lead to difficult clinical decisions relating to both investigation and potentially decisions about preterm delivery with risks to one or both fetuses.

The GDG recognised that any pregnancy complicated by a fetal anomaly requires careful ultrasound examination, investigation and discussion between the woman and healthcare professionals, including specialist paediatricians, with accurate information about prognosis. Women with a discordant fetal anomaly may consider selective termination of pregnancy and accurate risks for surviving fetuses and the timing of the procedure need careful discussion. In monochorionic twins, transfusional and haemodynamic fluctuation in intertwin blood flow during selective termination procedures should be discussed. Such procedures are highly specialised and should be offered only in supraregional centres. If selective termination of pregnancy is not an option or is declined by the woman, then there may be risks to the whole pregnancy. Such scenarios require specialist ultrasound examination, investigation and counselling and carefully planned management, including the woman's local multidisciplinary team if necessary.

Discordant (single) fetal death increases perinatal morbidity and mortality in surviving fetuses, irrespective of chorionicity. Informed and expert management is vital, as inappropriate intervention may lead to the live birth of a baby at very high risk of neurodevelopmental damage that may be compounded by the effects of prematurity. Surviving twins in monochorionic discordant fetal death have a significant risk of neurodevelopmental morbidity

from the effects of transfusional haemodynamic fluctuations, which may lead to (significant) neurodevelopmental morbidity in up to 20% of cases. Specialist counselling, investigation and triage of these pregnancies is vital to minimise long-term morbidity.

The GDG concluded that uncomplicated triplet pregnancies can be managed in the same antenatal setting as twin pregnancies, although the woman may need to give birth in a different unit to access appropriate neonatal care, and information about the likely need for neonatal care should be provided. The GDG placed a high value on the 'normalisation' of twin and triplet pregnancies throughout the development process and this is reflected in its recommendations.

The GDG highlighted that monitoring and planning clinical management of triplet pregnancies in collaboration with teams with subspecialist training in fetal medicine should result in optimum care because subspecialist teams have additional experience and expertise in assessing clinical risks and possible outcomes. Subspecialist teams should also be able to give women with triplet pregnancies information about options and likely outcomes of interventions and non-interventions, and counselling and support required when faced with difficult decisions and potential ongoing psychological and emotional stress.

5.1.3 Patient experience

No relevant patient experience information was identified.

5.1.4 Patient safety

No patient safety evidence was identified (see full report from the patient safety function at the NHS Commissioning Board for broader themes).

5.1.5 Current practice

No relevant current practice information was identified.

5.1.6 Current indicators

No relevant current indicators were identified.

6 Preparation for preterm birth

6.1 NICE CG129 Recommendation 1.7.1.1, 1.7.1.2, 1.7.1.3, 1.7.1.4, 1.7.1.5, 1.7.1.6, and 1.7.1.7.

6.1.1 Relevant NICE clinical guideline recommendations and proposed quality statement

Guideline recommendations	1.7.1.1 Discuss with women with twin and triplet pregnancies the timing of birth and possible modes of delivery early in the third trimester. 1.7.1.2 Inform women with twin pregnancies that about 60% of twin pregnancies result in spontaneous birth before 37 weeks 0 days. 1.7.1.3 Inform women with triplet pregnancies that about 75% of triplet pregnancies result in spontaneous birth before 35 weeks 0 days. 1.7.1.4 Inform women with twin and triplet pregnancies that spontaneous preterm birth and elective preterm birth are associated with an increased risk of admission to a special care baby unit. 1.7.1.5 Inform women with uncomplicated monochorionic twin pregnancies that elective birth from 36 weeks 0 days does not appear to be associated with an increased risk of serious adverse outcomes, and that continuing uncomplicated twin pregnancies beyond 38 weeks 0 days increases the risk of fetal death. 1.7.1.6 Inform women with uncomplicated dichorionic twin pregnancies that elective birth from 37 weeks 0 days does not appear to be associated with an increased risk of serious adverse outcomes, and that continuing uncomplicated twin pregnancies beyond 38 weeks 0 days increases the risk of fetal death. 1.7.1.7 Inform women with triplet pregnancies that continuing uncomplicated triplet pregnancies beyond 36 weeks 0 days increases the risk of fetal death.
Proposed quality statement	Women with a multiple pregnancy have the timing of birth discussed with them early in the third trimester.
Draft quality measure	**Structure:** Evidence of local arrangements to ensure women with a multiple pregnancy have the timing of birth discussed with them early in the third trimester. **Process:** The proportion of women with a multiple pregnancy who have the timing of birth discussed with them early in the third trimester. Numerator – The number of women in the denominator who have the timing of birth discussed with them early in the third

	trimester. Denominator – The number of women with a multiple pregnancy. **Outcome:** Women with multiple pregnancy feel fully informed about the increased likelihood that their babies will delivery early**.**
Definitions	**The following information should be discussed:** • about 60% of twin pregnancies result in spontaneous birth before 37 weeks 0 days. • about 75% of triplet pregnancies result in spontaneous birth before 35 weeks 0 days. • spontaneous preterm birth and elective preterm birth are associated with an increased risk of admission to a special care baby unit. • elective birth from 36 weeks 0 days for uncomplicated monochorionic twin pregnancies does not appear to be associated with an increased risk of serious adverse outcomes, and continuing uncomplicated twin pregnancies beyond 38 weeks 0 days increases the risk of fetal death. • elective birth from 37 weeks 0 days uncomplicated dichorionic twin pregnancies for does not appear to be associated with an increased risk of serious adverse outcomes, and that continuing uncomplicated twin pregnancies beyond 38 weeks 0 days increases the risk of fetal death. • continuing uncomplicated triplet pregnancies beyond 36 weeks 0 days increases the risk of fetal death. **Third trimester:** the third trimester is from 28 weeks 0 days until birth.
Discussion points for TEG	Need to define when in third trimester in number of weeks – the guideline says at the 28 week appointment to discuss the timing and mode of delivery? Should we say at 28 weeks? If the timing of birth is discussed then will part of this discussion be to offer them elective birth according to their chorionicity as per the statement below? Who discusses this with the women – can we define in statement?

6.1.2 Clinical and cost-effectiveness evidence

The GDG identified evidence from three studies (very low quality) that demonstrated benefit in giving women with twin pregnancies additional information on preterm birth and emotional support during the antenatal period. There were significantly fewer women with preterm, prelabour rupture of membranes or preterm labour in the group that received additional information and support compared with the group that received standard care.

The GDG highlighted the importance of a member of the core team starting discussions and planning regarding timing of birth and mode of delivery before the time at which elective birth would occur if the woman has accepted the offer of elective birth. When considering the number of antenatal appointments women with a multiple pregnancy should receive the group's consensus view was that at least two of the appointments should be with the specialist obstetrician (regardless of the chorionicity of the pregnancy). The purpose of these appointments is to assess and discuss the risks associated with the individual pregnancy, and to discuss timing and mode of birth.

The GDG did not identify any evidence in relation to the optimal surveillance strategy for pregnancies that continue beyond 37 weeks 0 days, 36 weeks 0 days or 35 weeks 0 days in dichorionic twins, monochorionic twins and triplets, respectively.

The evidence reviewed by the GDG indicated that 58% of women with twin pregnancies give birth spontaneously before 37 weeks 0 days. No comparable evidence was identified for triplet pregnancies; however, the GDG is aware of literature suggesting that about 75% of women with triplet pregnancies give birth spontaneously before 35 weeks 0 days.

6.1.3 Patient experience

The 2011 TAMBA Health and Lifestyle survey reported that multiple-birth babies are more likely to require neonatal care and it is important that parents prepare themselves for the possibility that one or more of their babies may need special care in a neonatal unit. The survey also found that 21.3% of parents were not prepared for the increased likelihood that their babies might require neonatal care. They found that of those parents who said they were unprepared 54% went on to have one or more baby in neonatal care.

6.1.4 Patient safety

No patient safety evidence was identified (see full report from the patient safety function at the NHS Commissioning Board for broader themes).

6.1.5 Current practice

It is commonly acknowledged by healthcare professionals that twin and triplet pregnancies tend to come to an end earlier than singleton pregnancies. It is also a widely held, although often contested, view among clinicians that perinatal outcomes in twin and triplet pregnancies worsen with increasing gestational age after 37 weeks. As a result, women with twin and triplet pregnancies are often advised to undergo elective birth without any obvious indication.

The report into the maternity care for women having a multiple birth by the National Perinatal Epidemiology Unit report found almost all singleton infants born to women in the study were delivered at term (mean, 39.5 weeks). Twins and triplets were more likely to be born early, twins mean gestation of 36.4 weeks and triplets mean gestation 33.3 weeks.

6.1.6 Current indicators

The Health and Social Care Information Centre (2011) Maternity Statistics – 2010-2011

- Complications recorded during the delivery episode, 2010-11 (Table 22).
- Complications during non-delivery obstetric episodes, 2010-11 (Table 24).
- Singleton, twin and higher order multiple deliveries by gestation and birth status, 2010-11 (Table 26).

7 Offering an elective birth

7.1 NICE CG129 Recommendation 1.7.1.8 [KPI]

7.1.1 Relevant NICE clinical guideline recommendations and proposed quality statement

Guideline recommendations	1.7.1.8 (KPI) Offer women with uncomplicated: • monochorionic twin pregnancies elective birth from 36 weeks 0 days, after a course of antenatal corticosteroids has been offered • dichorionic twin pregnancies elective birth from 37 weeks 0 days • triplet pregnancies elective birth from 35 weeks 0 days, after a course of antenatal corticosteroids has been offered.
Proposed quality statement	Women with an uncomplicated multiple pregnancy are offered elective birth timed according to the chorionicity of their pregnancy.
Draft quality measure	**Structure:** Evidence of local arrangements to ensure that women with an uncomplicated multiple pregnancy are offered elective birth timed according to the chorionicity of their pregnancy. **Process:** a) The proportion of women with an uncomplicated dichorionic twin pregnancy who receive an offer for elective birth from 37 weeks 0 days. Numerator – The number of women in the denominator who receive an offer for elective birth from 37 weeks 0 days. Denominator – The number of women with an uncomplicated dichorionic twin pregnancy. b) The proportion of women with an uncomplicated monochorionic twin pregnancy who receive an offer for elective birth from 36 weeks 0 days, after a course of antenatal corticosteroids has been offered. Numerator – The number of women in the denominator who receive an offer for elective birth from 36 weeks 0 days, after a course of antenatal corticosteroids has been offered. Denominator – The number of women with an uncomplicated monochorionic twin pregnancy. c) The proportion of women with an uncomplicated triplet pregnancy who receive an offer for elective birth from 35 weeks 0 days, after a course of antenatal

	corticosteroids has been offered. Numerator - The number of women in the denominator who receive an offer for elective birth from 35 weeks 0 days, after a course of antenatal corticosteroids has been offered. Denominator – The number of women with an uncomplicated triplet pregnancy. **Outcome:**
Definitions	**Uncomplicated:** A pregnancy in the absence of maternal and fetal complications that are associated with twin and triplet pregnancies
Discussion points for TEG	At what time should this be done? The full guideline says at 34 weeks to offer elective birth or 36 weeks if dichorionic and diamniotic pregnancy?

7.1.2 Clinical and cost-effectiveness evidence

The GDG highlighted the importance of a member of the core team starting discussions and planning regarding timing of birth and mode of delivery before the time at which elective birth would occur if the woman has accepted the offer of elective birth. When considering the number of antenatal appointments women with a multiple pregnancy should receive the group's consensus view was that at least two of the appointments should be with the specialist obstetrician (regardless of the chorionicity of the pregnancy). The purpose of these appointments is to assess and discuss the risks associated with the individual pregnancy, and to discuss timing and mode of birth.

The GDG recognised the importance of offering antenatal administration of corticosteroids for elective preterm birth in monochorionic twin pregnancies and triplet pregnancies. The specialist team should discuss with all women with twin and triplet pregnancies the possibility of their babies being admitted to a special care unit if they have a spontaneous preterm birth or if the offer of elective preterm birth is accepted.

7.1.3 Patient experience

No relevant patient experience was identified.

7.1.4 Patient safety

There is evidence of unexpected complications following multiple births which can result in capacity issues in admissions to specialist units and potentially result in treatment delay and/or parental distress when babies cannot all be treated in the same unit. There is also an additional risk of harm to some

mothers due to complications at birth which highlights the importance of preplanning birth arrangements.

7.1.5 Current practice

The 2009 Confidential Enquiry into Maternal and Child Health (CEMACH) perinatal mortality report identified that respiratory pathology is the most common cause for mortality in both singleton and twins. A higher rate in twins probably reflected the lower median gestational age of twins.

The 2011 National Neonatal Audit Programme Annual Report found at least one dose of antenatal steroids was administered to 76% of all eligible mothers (including eligible mothers with singleton pregnancies) who delivered babies between 24+0 and 34+6 weeks gestation.

7.1.6 Current indicators

No relevant current indicators were identified.

7.2 Appendix A: Definition of patient safety

The National Patient Safety Agency (NPSA) defines patient safety in the following terms:

Every day more than a million people are treated safely and successfully in the NHS, but the evidence tells us that in complex healthcare systems things will and do go wrong, no matter how dedicated and professional the staff. When things go wrong, patients are at risk of harm, and the effects are widespread and often devastating for patients, their families and the staff involved. Safety incidents also incur costs through litigation and extra treatment, and in 2009/10 the NHSLA paid out approximately £827, 000,000 in litigation costs and damages. These incidents are often caused by poor system design rather than the error of individuals i.e. 'they are an accident waiting to happen'.

In short patient safety could be summarised as 'The identification and reduction of risk and harm associated with the care provided to patients 'or 'Preventing patients from being harmed by their treatment'. Examples of this might be 'operating on or removing the wrong organ, ten times the dose of an opioid, giving a colonoscopy to the wrong patient with the same name as someone else in the waiting room etc.' These risks are unlikely to be identified through clinical trials or traditional evidence bases and so other evidence sources, such as the National Reporting and Learning System, need to be analysed to highlight the risks and improve system development. This does not however give an accurate picture of prevalence in that way that methods such as casenote review may do.