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# **Intrapartum care**

**Care of healthy women and their babies during childbirth**

**NICE clinical guideline 55**  
**Intrapartum care: care of healthy women and their babies during childbirth**

**Ordering information**

You can download the following documents from [www.nice.org.uk/CG055](http://www.nice.org.uk/CG055)

- The NICE guideline (this document) – all the recommendations.
- A quick reference guide – a summary of the recommendations for healthcare professionals.
- ‘Understanding NICE guidance’ – information for patients and carers.
- The full guideline – all the recommendations, details of how they were developed, and reviews of the evidence they were based on.

For printed copies of the quick reference guide or ‘Understanding NICE guidance’, phone the NHS Response Line on 0870 1555 455 and quote:

- N1326 (quick reference guide)
- N1327 (‘Understanding NICE guidance’).

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## Introduction

Birth is a life-changing event and the care given to women during labour has the potential to affect them both physically and emotionally in the short and longer term.

This guideline covers the care of healthy women in labour at term (37–42 weeks). About 600,000 women give birth in England and Wales each year, of whom about 40% are having their first baby. Most of these women are healthy and have a straightforward pregnancy. Almost 90% of women will give birth to a single baby after 37 weeks of pregnancy with the baby presenting head first. Most women (about two thirds) go into labour spontaneously. The majority of women giving birth in the UK therefore fall under the scope of this guideline.

This guideline does not cover the care of women with suspected or confirmed preterm labour; women with an intrauterine death of their baby; women with coexisting severe morbidities such as pre-eclampsia or diabetes; women who have multiple pregnancies; or women with intrauterine growth retardation of the unborn baby.

This guideline provides an update of 'The use of electronic fetal monitoring: The use and interpretation of cardiotocography in intrapartum fetal surveillance' (Inherited clinical guideline C) issued in 2001. Inherited clinical guideline C will be withdrawn upon publication of this new guideline.

## **Woman- and baby-centred care**

This guideline offers best practice advice on the care of healthy women in labour and their babies.

Women and their families should always be treated with kindness, respect and dignity. The views, beliefs and values of the woman, her partner and her family in relation to her care and that of her baby should be sought and respected at all times. The woman should be fully involved in planning her birth setting so that care is flexible and tailored to meet her needs and those of her baby.

Women should have the opportunity to make informed decisions about their care and any treatment needed. If a woman does not have the capacity to make decisions, healthcare professionals should follow the Department of Health guidelines 'Reference guide to consent for examination or treatment' (2001) (available from [www.dh.gov.uk](http://www.dh.gov.uk)).

Good communication between healthcare professionals and the woman and her family is essential. It should be supported by the provision of evidence-based written information tailored to the needs of the individual woman. Care and information should be appropriate to the woman, and her cultural practices should be taken into account. All information given should also be accessible to women, their partners and families, taking into account any additional needs such as physical, cognitive or sensory disabilities and inability to speak or read English.

## **Key priorities for implementation**

### **Communication**

- All women in labour should be treated with respect and should be in control of and involved in what is happening to them, and the way in which care is given is key to this. To facilitate this, healthcare professionals and other caregivers should establish a rapport with the labouring woman, asking her about her wants and expectations for labour, being aware of the importance of tone and demeanour, and of the actual words they use. This information should be used to support and guide her through her labour.

### **Support in labour**

- A woman in established labour should receive supportive one-to-one care.
- A woman in established labour should not be left on her own except for short periods or at the woman's request.

### **Normal labour**

- Clinical intervention should not be offered or advised where labour is progressing normally and the woman and baby are well.

### **Planning place of birth**

- Women should be offered the choice of planning birth at home, in a midwife-led unit or in an obstetric unit. Women should be informed:
  - That giving birth is generally very safe for both the woman and her baby.
  - That the available information on planning place of birth is not of good quality, but suggests that among women who plan to give birth at home or in a midwife-led unit there is a higher likelihood of a normal birth, with less intervention. We do not have enough information about the possible risks to either the woman or her baby relating to planned place of birth.
  - That the obstetric unit provides direct access to obstetricians, anaesthetists, neonatologists and other specialist care including epidural analgesia.

- Of locally available services, the likelihood of being transferred into the obstetric unit and the time this may take.
- That if something does go unexpectedly seriously wrong during labour at home or in a midwife-led unit, the outcome for the woman and baby could be worse than if they were in the obstetric unit with access to specialised care.
- That if she has a pre-existing medical condition or has had a previous complicated birth that makes her at higher risk of developing complications during her next birth, she should be advised to give birth in an obstetric unit.
- Clinical governance structures should be implemented in all places of birth (see boxes 1 and 2).

### **Coping with pain**

- The opportunity to labour in water is recommended for pain relief.
- Before choosing epidural analgesia, women should be informed about the risks and benefits, and the implications for their labour.

### **Perineal care**

- If genital trauma is identified following birth, further systematic assessment should be carried out, including a rectal examination.

### **Delay in the first stage**

- When delay in the established first stage of labour is confirmed in nulliparous women, advice should be sought from an obstetrician and the use of oxytocin should be considered. The woman should be informed that the use of oxytocin following spontaneous or artificial rupture of the membranes will bring forward her time of birth but will not influence the mode of birth or other outcomes.

### **Instrumental birth**

- Instrumental birth is an operative procedure that should be undertaken with tested effective anaesthesia.

# 1 Guidance

The following guidance is based on the best available evidence. The full guideline ([www.nice.org.uk/CG055fullguideline](http://www.nice.org.uk/CG055fullguideline)) gives details of the methods and the evidence used to develop the guidance (see section 5 for details).

## 1.1 *Planning place of birth*

1.1.1 Women should be offered the choice of planning birth at home, in a midwife-led unit or in an obstetric unit. Women should be informed:

- That giving birth is generally very safe for both the woman and her baby.
- That the available information on planning place of birth is not of good quality, but suggests that among women who plan to give birth at home or in a midwife-led unit there is a higher likelihood of a normal birth, with less intervention. We do not have enough information about the possible risks to either the woman or her baby relating to planned place of birth.
- That the obstetric unit provides direct access to obstetricians, anaesthetists, neonatologists and other specialist care including epidural analgesia.
- Of locally available services, the likelihood of being transferred into the obstetric unit and the time this may take.
- That if something does go unexpectedly seriously wrong during labour at home or in a midwife-led unit, the outcome for the woman and baby could be worse than if they were in the obstetric unit with access to specialised care.
- That if she has a pre-existing medical condition or has had a previous complicated birth that makes her at higher risk of developing complications during her next birth, she should be advised to give birth in an obstetric unit.

- 1.1.2 Clinical governance structures should be implemented in all places of birth (see boxes 1 and 2).

**Box 1 Clinical governance in all settings**

Multidisciplinary clinical governance structures, of which the Labour Ward Forum is an example, should be in place to enable the oversight of all places of birth. These structures should include, as a minimum, midwifery (ideally a supervisor of midwives), obstetric, anaesthetic and neonatal expertise, and adequately supported user representation.

Rotating staff between obstetric and midwife-led units should be encouraged in order to maintain equivalent competency and experience.

Clear referral pathways should be in place to enable midwives to inform or seek advice from a supervisor of midwives when caring for a woman who may have risk factors but does not wish to labour in an obstetric unit.

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 the woman about her chosen place of birth in the hand-held maternity notes.

In all places of birth, risk assessment in the antenatal period and when labour commences should be subject to continuous audit.

Monthly figures of numbers of women booked for, being admitted to, being transferred from and giving birth in each place of birth should be audited. This should include maternal and neonatal outcomes.

The clinical governance group should be responsible for detailed root-cause analysis of any serious maternal or neonatal adverse outcomes (for example, intrapartum-related perinatal death or seizures in the neonatal period) and consider any 'near misses' identified through risk-management systems. The Confidential Enquiry into Maternal and Child Health (CEMACH) and the

National Patient Safety Agency (NPSA)'s 'Seven steps to patient safety' provide a framework for meeting clinical governance and risk-management targets.

Data must be submitted to the national registries for either intrapartum-related perinatal mortality or neonatal encephalopathy once these are in existence.

### **Box 2 Clinical governance for settings other than 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 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 times when the nearest obstetric or neonatal unit is closed to admissions.

If the emergency is such that transfer is not possible, open access must be given on-site for any 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 or neonatologist and the time from admission to birth.

- 1.1.3 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.
- 1.1.4 National registries of the root-cause analysis findings relating to all intrapartum-related deaths over 37 weeks of gestation should be established.
- 1.1.5 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.
- 1.1.6 Tables 1, 2, 3 and 4 should be used as part of an assessment for choosing place of birth.

Tables 1 and 2 show medical conditions or situations in which there is increased risk for the woman or baby during or shortly after labour, where care in an obstetric unit would be expected to reduce this risk.

The factors listed in tables 3 and 4 are not reasons in themselves for advising birth within an obstetric unit but indicate that further consideration of birth setting may be required.

These risks and the additional care that can be provided in the obstetric unit should be discussed with the woman so that she can make an informed choice about place of birth.

**Table 1 Medical conditions indicating increased risk suggesting planned birth at an obstetric unit**

<b>Disease area</b>	<b>Medical condition</b>
Cardiovascular	Confirmed cardiac disease Hypertensive disorders
Respiratory	Asthma requiring an increase in treatment or hospital treatment Cystic fibrosis
Haematological	Haemoglobinopathies – sickle-cell disease, beta-thalassaemia major History of thromboembolic disorders Immune thrombocytopenia purpura or other platelet disorder or platelet count below 100,000 Von Willebrand's disease Bleeding disorder in the woman or unborn baby Atypical antibodies which carry a risk of haemolytic disease of the newborn
Infective	Risk factors associated with group B streptococcus whereby antibiotics in labour would be recommended Hepatitis B/C with abnormal liver function tests Carrier of/infected with HIV Toxoplasmosis – women receiving treatment Current active infection of chicken pox/rubella/genital herpes in the woman or baby Tuberculosis under treatment
Immune	Systemic lupus erythematosus Scleroderma
Endocrine	Hyperthyroidism Diabetes
Renal	Abnormal renal function Renal disease requiring supervision by a renal specialist
Neurological	Epilepsy Myasthenia gravis Previous cerebrovascular accident
Gastrointestinal	Liver disease associated with current abnormal liver function tests
Psychiatric	Psychiatric disorder requiring current inpatient care

**Table 2 Other factors indicating increased risk suggesting planned birth at an obstetric unit**

Factor	Additional information
Previous complications	Unexplained stillbirth/neonatal death or previous death related to intrapartum difficulty Previous baby with neonatal encephalopathy Pre-eclampsia requiring preterm birth Placental abruption with adverse outcome Eclampsia Uterine rupture Primary postpartum haemorrhage requiring additional treatment or blood transfusion Retained placenta requiring manual removal in theatre Caesarean section Shoulder dystocia
Current pregnancy	Multiple birth Placenta praevia Pre-eclampsia or pregnancy-induced hypertension Preterm labour or preterm prelabour rupture of membranes Placental abruption Anaemia – haemoglobin less than 8.5 g/dl at onset of labour Confirmed intrauterine death Induction of labour Substance misuse Alcohol dependency requiring assessment or treatment Onset of gestational diabetes Malpresentation – breech or transverse lie Body mass index at booking of greater than 35 kg/m <sup>2</sup> Recurrent antepartum haemorrhage
Fetal indications	Small for gestational age in this pregnancy (less than fifth centile or reduced growth velocity on ultrasound) Abnormal fetal heart rate (FHR)/Doppler studies Ultrasound diagnosis of oligo-/polyhydramnios
Previous gynaecological history	Myomectomy Hysterotomy

**Table 3 Medical conditions indicating individual assessment when planning place of birth**

Disease area	Medical condition
Cardiovascular	Cardiac disease without intrapartum implications
Haematological	Atypical antibodies not putting the baby at risk of haemolytic disease Sickle-cell trait Thalassaemia trait Anaemia – haemoglobin 8.5–10.5 g/dl at onset of labour
Infective	Hepatitis B/C with normal liver function tests
Immune	Non-specific connective tissue disorders
Endocrine	Unstable hypothyroidism such that a change in treatment is required
Skeletal/neurological	Spinal abnormalities Previous fractured pelvis Neurological deficits
Gastrointestinal	Liver disease without current abnormal liver function Crohn's disease Ulcerative colitis

**Table 4 Other factors indicating individual assessment when planning place of birth**

Factor	Additional information
Previous complications	Stillbirth/neonatal death with a known non-recurrent cause Pre-eclampsia developing at term Placental abruption with good outcome History of previous baby more than 4.5 kg Extensive vaginal, cervical, or third- or fourth-degree perineal trauma Previous term baby with jaundice requiring exchange transfusion
Current pregnancy	Antepartum bleeding of unknown origin (single episode after 24 weeks of gestation) Body mass index at booking of 30–34 kg/m <sup>2</sup> Blood pressure of 140 mmHg systolic or 90 mmHg diastolic on two occasions Clinical or ultrasound suspicion of macrosomia Para 6 or more Recreational drug use Under current outpatient psychiatric care Age over 40 at booking
Fetal indications	Fetal abnormality
Previous gynaecological history	Major gynaecological surgery Cone biopsy or large loop excision of the transformation zone Fibroids

## **1.2 *Indications for intrapartum transfer***

1.2.1 The following risks and benefits should be assessed when considering transfer to an obstetric unit, bearing in mind the likelihood of birth during the transfer:

- indications for electronic fetal monitoring (EFM) including abnormalities of the fetal heart rate (FHR) on intermittent auscultation
- delay in the first or second stages of labour
- significant meconium-stained liquor
- maternal request for epidural pain relief
- obstetric emergency – antepartum haemorrhage, cord presentation/prolapse, postpartum haemorrhage, maternal collapse or a need for advanced neonatal resuscitation
- retained placenta
- maternal pyrexia in labour (38.0°C once or 37.5°C on two occasions 2 hours apart)
- malpresentation or breech presentation diagnosed for the first time at the onset of labour, taking into account imminence of birth
- either raised diastolic blood pressure (over 90 mmHg) or raised systolic blood pressure (over 140 mmHg) on two consecutive readings taken 30 minutes apart
- uncertainty about the presence of a fetal heartbeat
- third- or fourth-degree tear or other complicated perineal trauma requiring suturing.

## **1.3 *Care throughout labour***

### **Communication**

1.3.1 All women in labour should be treated with respect and should be in control of and involved in what is happening to them, and the way in which care is given is key to this. To facilitate this, healthcare professionals and other caregivers should establish a

rapport with the labouring woman, asking her about her wants and expectations for labour, being aware of the importance of tone and demeanour, and of the actual words they use. This information should be used to support and guide her through her labour.

1.3.2 To establish communication with the labouring woman, healthcare professionals should:

- Greet the woman with a smile and a personal welcome, establish her language needs, introduce themselves and explain their role in her care.
- Maintain a calm and confident approach so that their demeanour reassures the woman that all is going well.
- Knock and wait before entering the woman's room, respecting it as her personal space, and ask others to do the same.
- Ask how the woman is feeling and whether there is anything in particular she is worried about.
- If the woman has a written birth plan, read and discuss it with her.
- Assess the woman's knowledge of strategies for coping with pain and provide balanced information to find out which available approaches are acceptable to her.
- Encourage the woman to adapt the environment to meet her individual needs.
- Ask her permission before all procedures and observations, focusing on the woman rather than the technology or the documentation.
- Show the woman and her birth partner how to summon help and reassure her that she may do so whenever and as often as she needs to. When leaving the room, healthcare professionals should let her know when they will return.
- Involve the woman in any handover of care to another professional, either when additional expertise has been brought in or at the end of a shift.

### **Mobilisation**

- 1.3.3 Women should be encouraged and helped to move and adopt whatever positions they find most comfortable throughout labour.

### **Support in labour**

- 1.3.4 A woman in established labour should receive supportive one-to-one care.
- 1.3.5 A woman in established labour should not be left on her own except for short periods or at the woman's request.
- 1.3.6 Women should be encouraged to have support by birth partner(s) of their choice.
- 1.3.7 Team midwifery (defined as a group of midwives providing care and taking shared responsibility for a group of women from the antenatal, through intrapartum to the postnatal period) is not recommended.

### **Controlling gastric acidity**

- 1.3.8 Neither H<sub>2</sub>-receptor antagonists nor antacids should be given routinely to low-risk women.
- 1.3.9 Either H<sub>2</sub>-receptor antagonists or antacids should be considered for women who receive opioids or who have or develop risk factors that make a general anaesthetic more likely.
- 1.3.10 Women may drink during established labour and be informed that isotonic drinks may be more beneficial than water.
- 1.3.11 Women may eat a light diet in established labour unless they have received opioids or they develop risk factors that make a general anaesthetic more likely.

### **Hygiene measures**

- 1.3.12 Tap water may be used if cleansing is required prior to vaginal examination.

- 1.3.13 Routine hygiene measures taken by staff caring for women in labour, including standard hand hygiene and single-use non-sterile gloves, are appropriate to reduce cross-contamination between women, babies and healthcare professionals.
- 1.3.14 Selection of protective equipment should be based on an assessment of the risk of transmission of microorganisms to the woman, and the risk of contamination of the healthcare practitioner's clothing and skin by women's blood, body fluids, secretions or excretions<sup>1</sup>.

## **1.4 Coping with pain in labour: non-epidural**

### **Attitudes to pain and pain relief in childbirth**

- 1.4.1 Healthcare professionals should consider how their own values and beliefs inform their attitude to coping with pain in labour and ensure their care supports the woman's choice.

### **Pain-relieving strategies**

- 1.4.2 Women who choose to use breathing and relaxation techniques in labour should be supported in their choice.
- 1.4.3 Women who choose to use massage techniques in labour that have been taught to birth partners should be supported in their choice.
- 1.4.4 The opportunity to labour in water is recommended for pain relief.
- 1.4.5 For women labouring in water, the temperature of the woman and the water should be monitored hourly to ensure that the woman is comfortable and not becoming pyrexial. The temperature of the water should not be above 37.5°C.

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<sup>1</sup> This recommendation is from 'Infection control: prevention of healthcare-associated infection in primary and community care' (NICE clinical guideline 2).

- 1.4.6 Any bath or birthing pool should be kept clean using a protocol agreed with the microbiology department and, in the case of birthing pools, in accordance with the manufacturer's guidelines.
- 1.4.7 The use of injected water papules is not recommended.
- 1.4.8 Acupuncture, acupressure and hypnosis should not be provided, but women who wish to use these techniques should not be prevented from doing so.
- 1.4.9 The playing of music of the woman's choice in the labour ward should be supported.

#### **Non-pharmacological analgesia**

- 1.4.10 Transcutaneous electrical nerve stimulation (TENS) should not be offered to women in established labour.

#### **Inhalational analgesia**

- 1.4.11 Entonox (a 50:50 mixture of oxygen and nitrous oxide) should be available in all birth settings as it may reduce pain in labour, but women should be informed that it may make them feel nauseous and light-headed.

#### **Intravenous and intramuscular opioids**

- 1.4.12 Pethidine, diamorphine or other opioids should be available in all birth settings. Women should be informed that these will provide limited pain relief during labour and may have significant side effects for both the woman (drowsiness, nausea and vomiting) and her baby (short-term respiratory depression and drowsiness which may last several days).
- 1.4.13 Women should be informed that pethidine, diamorphine or other opioids may interfere with breastfeeding.
- 1.4.14 If an intravenous or intramuscular opioid is used, it should be administered with an antiemetic.

- 1.4.15 Women should not enter water (a birthing pool or bath) within 2 hours of opioid administration or if they feel drowsy.

## **1.5 *Pain relief in labour: regional analgesia***

### **Information about regional analgesia**

- 1.5.1 Before choosing epidural analgesia, women should be informed about the risks and benefits, and the implications for their labour.
- 1.5.2 This information about choosing epidural analgesia should include the following:
- It is only available in obstetric units.
  - It provides more effective pain relief than opioids.
  - It is associated with a longer second stage of labour and an increased chance of vaginal instrumental birth.
  - It is not associated with long-term backache.
  - It is not associated with a longer first stage of labour or an increased chance of caesarean birth.
  - It will be accompanied by a more intensive level of monitoring and intravenous access.
  - Modern epidural solutions contain opioids and, whatever the route of administration, all opioids cross the placenta and in larger doses (greater than 100 micrograms in total) may cause short-term respiratory depression in the baby and make the baby drowsy.

### **Timing of regional analgesia**

- 1.5.3 Women in labour who desire regional analgesia should not be denied it, including women in severe pain in the latent first stage of labour.

### **Care and observations for women with regional analgesia**

- 1.5.4 Intravenous access should always be secured prior to commencing regional analgesia.

- 1.5.5 Preloading and maintenance fluid infusion need not be administered routinely before establishing low-dose epidural analgesia and combined spinal–epidural analgesia.
- 1.5.6 The following additional observations should be undertaken for women with regional analgesia:
- During establishment of regional analgesia or after further boluses (10 ml or more of low-dose solutions) blood pressure should be measured every 5 minutes for 15 minutes.
  - If the woman is not pain free 30 minutes after each administration of local anaesthetic/opioid solution, the anaesthetist should be recalled.
  - Hourly assessment of the level of the sensory block should be undertaken.
- 1.5.7 Women with regional analgesia should be encouraged to move and adopt whatever upright positions they find comfortable throughout labour.
- 1.5.8 Once established, regional analgesia should be continued until after completion of the third stage of labour and any necessary perineal repair.
- 1.5.9 Upon confirmation of full cervical dilatation in women with regional analgesia, unless the woman has an urge to push or the baby’s head is visible, pushing should be delayed for at least 1 hour and longer if the woman wishes, after which pushing during contractions should be actively encouraged.
- 1.5.10 Following the diagnosis of full dilatation in a woman with regional analgesia, a plan should be agreed with the woman in order to ensure that birth will have occurred within 4 hours regardless of parity.
- 1.5.11 Oxytocin should not be used as a matter of routine in the second stage of labour for women with regional analgesia.

- 1.5.12 Continuous EFM is recommended for at least 30 minutes during establishment of regional analgesia and after administration of each further bolus of 10 ml or more.

For complicated labour: second stage, see section 1.14.

### **Establishing and maintaining regional analgesia**

- 1.5.13 Either epidural or combined spinal–epidural analgesia is recommended for establishing regional analgesia in labour.
- 1.5.14 If rapid analgesia is required, combined spinal–epidural analgesia is recommended.
- 1.5.15 It is recommended that combined spinal–epidural analgesia is established with bupivacaine and fentanyl.
- 1.5.16 It is recommended that epidural analgesia is established with a low-concentration local anaesthetic and opioid solution with, for example, 10–15 ml of 0.0625–0.1% bupivacaine with 1–2 micrograms per ml fentanyl. The initial dose of local anaesthetic plus opioid is essentially a test dose and as such should be administered cautiously to ensure that inadvertent intrathecal injection has not occurred.
- 1.5.17 Low-concentration local anaesthetic and opioid solutions (0.0625–0.1% bupivacaine or equivalent combined with 2.0 micrograms per ml fentanyl) are recommended for maintaining epidural analgesia in labour.
- 1.5.18 High concentrations of local anaesthetic solutions (0.25% or above of bupivacaine or equivalent) should not be used routinely for either establishing or maintaining epidural analgesia.
- 1.5.19 Either patient-controlled epidural analgesia or intermittent bolus given by healthcare professionals are the preferred modes of administration for maintenance of epidural analgesia.

## **1.6 Normal labour: first stage**

1.6.1 Clinical intervention should not be offered or advised where labour is progressing normally and the woman and baby are well.

1.6.2 In all stages of labour, women who have left the normal care pathway due to the development of complications can return to it if/when the complication is resolved.

### **Definition of the first stage**

1.6.3 For the purposes of this guideline, the following definitions of labour are recommended:

- Latent first stage of labour – a period of time, not necessarily continuous, when:
  - there are painful contractions, and
  - there is some cervical change, including cervical effacement and dilatation up to 4 cm.
- Established first stage of labour – when:
  - there are regular painful contractions, and
  - there is progressive cervical dilatation from 4 cm.

### **Duration of the first stage**

1.6.4 Women should be informed that, while the length of established first stage of labour varies between women, first labours last on average 8 hours and are unlikely to last over 18 hours. Second and subsequent labours last on average 5 hours and are unlikely to last over 12 hours.

### **Definition of delay in the established first stage (see section 1.13)**

1.6.5 A diagnosis of delay in the established first stage of labour needs to take into consideration all aspects of progress in labour and should include:

- cervical dilatation of less than 2 cm in 4 hours for first labours

- cervical dilatation of less than 2 cm in 4 hours or a slowing in the progress of labour for second or subsequent labours
- descent and rotation of the fetal head
- changes in the strength, duration and frequency of uterine contractions.

### **Observations on presentation in suspected labour**

1.6.6 The initial assessment of a woman by a midwife should include:

- listening to her story, considering her emotional and psychological needs, and reviewing her clinical records
- physical observation – temperature, pulse, blood pressure, urinalysis
- length, strength and frequency of contractions
- abdominal palpation – fundal height, lie, presentation, position and station
- vaginal loss – show, liquor, blood
- assessment of the woman's pain, including her wishes for coping with labour along with the range of options for pain relief.

In addition:

- The FHR should be auscultated for a minimum of 1 minute immediately after a contraction. The maternal pulse should be palpated to differentiate between maternal and FHR.
- If the woman does not appear to be in established labour, after a period of assessment it may be helpful to offer a vaginal examination.
- If the woman appears to be in established labour, a vaginal examination should be offered.

1.6.7 Healthcare professionals who conduct vaginal examinations should:

- be sure that the vaginal examination is really necessary and will add important information to the decision-making process

- be aware that for many women who may already be in pain, highly anxious and in an unfamiliar environment, vaginal examinations can be very distressing
- ensure the woman's consent, privacy, dignity and comfort
- explain the reason for the examination and what will be involved, and
- explain the findings and their impact sensitively to the woman.

1.6.8 Some women have pain without cervical change. Although these women are described as not being in labour, they may well consider themselves 'in labour' by their own definition. Women who seek advice or attend hospital with painful contractions but who are not in established labour should be offered individualised support and occasionally analgesia, and encouraged to remain at or return home.

1.6.9 The use of admission cardiotocography (CTG) in low-risk pregnancy is not recommended in any birth setting.

### **Observations during the established first stage**

1.6.10 Verbal assessment using a numerical pain score is not recommended routinely.

1.6.11 A pictorial record of labour (partogram) should be used once labour is established.

1.6.12 Where the partogram includes an action line, the World Health Organization recommendation of a 4-hour action line should be used<sup>2</sup>.

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<sup>2</sup> Anonymous (1994) World Health Organization partograph in management of labour. World Health Organization Maternal Health and Safe Motherhood Programme. Lancet 343 (8910): 1399–404. See also [www.who.int/reproductive-health/impac/Clinical\\_Principles/Normal\\_labour\\_C57\\_C76.html](http://www.who.int/reproductive-health/impac/Clinical_Principles/Normal_labour_C57_C76.html)

1.6.13 Observations by a midwife during the first stage of labour include:

- 4-hourly temperature and blood pressure
- hourly pulse
- half-hourly documentation of frequency of contractions
- frequency of emptying the bladder
- vaginal examination offered 4-hourly, or where there is concern about progress or in response to the woman's wishes (after abdominal palpation and assessment of vaginal loss).

In addition:

- Intermittent auscultation of the fetal heart after a contraction should occur for at least 1 minute, at least every 15 minutes, and the rate should be recorded as an average. The maternal pulse should be palpated if a FHR abnormality is detected to differentiate the two heart rates. (See recommendations 1.6.19–24 for reasons to transfer to continuous EFM.)

1.6.14 Ongoing consideration should be given to the woman's emotional and psychological needs, including her desire for pain relief.

1.6.15 Women should be encouraged to communicate their need for analgesia at any point during labour.

#### **Possible routine interventions in the first stage**

1.6.16 The package known as active management of labour (one-to-one continuous support; strict definition of established labour; early routine amniotomy; routine 2-hourly vaginal examination; oxytocin if labour becomes slow) should not be offered routinely.

1.6.17 In normally progressing labour, amniotomy should not be performed routinely.

1.6.18 Combined early amniotomy with use of oxytocin should not be used routinely.

## **Fetal heart assessment and reasons for transfer to continuous electronic fetal monitoring**

- 1.6.19 Intermittent auscultation of the FHR is recommended for low-risk women in established labour in any birth setting.
- 1.6.20 Initial auscultation of the fetal heart is recommended at first contact in early labour and at each further assessment undertaken to determine whether labour has become established.
- 1.6.21 Once a woman is in established labour, intermittent auscultation of the fetal heart after a contraction should be continued as detailed in recommendation 1.6.13.
- 1.6.22 Intermittent auscultation can be undertaken by either Doppler ultrasound or Pinard stethoscope.
- 1.6.23 Changing from intermittent auscultation to continuous EFM in low-risk women should be advised for the following reasons:
- significant meconium-stained liquor, and this change should also be considered for light meconium-stained liquor (see recommendations 1.11.1 and 1.11.2)
  - abnormal FHR detected by intermittent auscultation (less than 110 beats per minute [bpm]; greater than 160 bpm; any decelerations after a contraction)
  - maternal pyrexia (defined as 38.0°C once or 37.5°C on two occasions 2 hours apart)
  - fresh bleeding developing in labour
  - oxytocin use for augmentation
  - the woman's request.
- 1.6.24 Women should be informed that continuous EFM will restrict their mobility.

## **1.7 Normal labour: second stage**

### **Definition of the second stage**

1.7.1 For the purposes of this guideline, the following definitions of labour are recommended:

- Passive second stage of labour:
  - the finding of full dilatation of the cervix prior to or in the absence of involuntary expulsive contractions.
- Onset of the active second stage of labour:
  - the baby is visible
  - expulsive contractions with a finding of full dilatation of the cervix or other signs of full dilatation of the cervix
  - active maternal effort following confirmation of full dilatation of the cervix in the absence of expulsive contractions.

### **Duration and definition of delay in the second stage (see section 1.14)**

1.7.2 Nulliparous women:

- Birth would be expected to take place within 3 hours of the start of the active second stage in most women.
- A diagnosis of delay in the active second stage should be made when it has lasted 2 hours and women should be referred to a healthcare professional trained to undertake an operative vaginal birth if birth is not imminent.

1.7.3 Parous women:

- Birth would be expected to take place within 2 hours of the start of the active second stage in most women.
- A diagnosis of delay in the active second stage should be made when it has lasted 1 hour and women should be referred to a healthcare professional trained to undertake an operative vaginal birth if birth is not imminent.

- 1.7.4 If full dilatation of the cervix has been diagnosed in a woman without epidural analgesia, but she does not get an urge to push, further assessment should take place after 1 hour.

### **Oxytocin in the second stage**

- 1.7.5 Consideration should be given to the use of oxytocin, with the offer of regional analgesia, for nulliparous women if contractions are inadequate at the onset of the second stage.

### **Observations during the second stage**

- 1.7.6 All observations should be documented on the partogram. Observations by a midwife of a woman in the second stage of labour include:

- hourly blood pressure and pulse
- continued 4-hourly temperature
- vaginal examination offered hourly in the active second stage or in response to the woman's wishes (after abdominal palpation and assessment of vaginal loss)
- half-hourly documentation of the frequency of contractions
- frequency of emptying the bladder
- ongoing consideration of the woman's emotional and psychological needs.

In addition:

- Assessment of progress should include maternal behaviour, effectiveness of pushing and fetal wellbeing, taking into account fetal position and station at the onset of the second stage. These factors will assist in deciding the timing of further vaginal examination and the need for obstetric review.
- Intermittent auscultation of the fetal heart should occur after a contraction for at least 1 minute, at least every 5 minutes. The maternal pulse should be palpated if there is suspected fetal

bradycardia or any other FHR anomaly to differentiate the two heart rates.

- Ongoing consideration should be given to the woman's position, hydration, coping strategies and pain relief throughout the second stage.

### **Women's position and pushing in the second stage**

- 1.7.7 Women should be discouraged from lying supine or semi-supine in the second stage of labour and should be encouraged to adopt any other position that they find most comfortable.
- 1.7.8 Women should be informed that in the second stage they should be guided by their own urge to push.
- 1.7.9 If pushing is ineffective or if requested by the woman, strategies to assist birth can be used, such as support, change of position, emptying of the bladder and encouragement.

### **Intrapartum interventions to reduce perineal trauma**

- 1.7.10 Perineal massage should not be performed by healthcare professionals in the second stage of labour.
- 1.7.11 Either the 'hands on' (guarding the perineum and flexing the baby's head) or the 'hands poised' (with hands off the perineum and baby's head but in readiness) technique can be used to facilitate spontaneous birth.
- 1.7.12 Lidocaine spray should not be used to reduce pain in the second stage of labour.
- 1.7.13 A routine episiotomy should not be carried out during spontaneous vaginal birth.
- 1.7.14 Where an episiotomy is performed, the recommended technique is a mediolateral episiotomy originating at the vaginal fourchette and usually directed to the right side. The angle to the vertical axis

should be between 45 and 60 degrees at the time of the episiotomy.

- 1.7.15 An episiotomy should be performed if there is a clinical need such as instrumental birth or suspected fetal compromise.
- 1.7.16 Tested effective analgesia should be provided prior to carrying out an episiotomy, except in an emergency due to acute fetal compromise.
- 1.7.17 Women with a history of severe perineal trauma should be informed that their risk of repeat severe perineal trauma is not increased in a subsequent birth, compared with women having their first baby.
- 1.7.18 Episiotomy should not be offered routinely at vaginal birth following previous third- or fourth-degree trauma.
- 1.7.19 In order for a woman who has had previous third- or fourth-degree trauma to make an informed choice, discussion with her about the future mode of birth should encompass:
- current urgency or incontinence symptoms
  - the degree of previous trauma
  - risk of recurrence
  - the success of the repair undertaken
  - the psychological effect of the previous trauma
  - management of her labour.
- 1.7.20 Women with infibulated genital mutilation should be informed of the risks of difficulty with vaginal examination, catheterisation and application of fetal scalp electrodes. They should also be informed of the risks of delay in the second stage and spontaneous laceration together with the need for an anterior episiotomy and the possible need for defibulation in labour.

## **Water birth**

- 1.7.21 Women should be informed that there is insufficient high-quality evidence to either support or discourage giving birth in water.

## **1.8 Normal labour: third stage**

### **Definition of the third stage**

- 1.8.1 For the purposes of this guideline, the following definitions are recommended:
- The third stage of labour is the time from the birth of the baby to the expulsion of the placenta and membranes.
  - Active management of the third stage involves a package of care which includes all of these three components:
    - routine use of uterotonic drugs
    - early clamping and cutting of the cord
    - controlled cord traction.
  - Physiological management of the third stage involves a package of care which includes all of these three components:
    - no routine use of uterotonic drugs
    - no clamping of the cord until pulsation has ceased
    - delivery of the placenta by maternal effort.

### **Prolonged third stage**

- 1.8.2 The third stage of labour is diagnosed as prolonged if not completed within 30 minutes of the birth of the baby with active management and 60 minutes with physiological management.

### **Observations in the third stage**

- 1.8.3 Observations by a midwife of a woman in the third stage of labour include:
- her general physical condition, as shown by her colour, respiration and her own report of how she feels
  - vaginal blood loss.

In addition, in the presence of haemorrhage, retained placenta or maternal collapse, frequent observations to assess the need for resuscitation are required.

### **Physiological and active management of the third stage**

- 1.8.4 Active management of the third stage is recommended, which includes the use of oxytocin (10 international units [IU] by intramuscular injection), followed by early clamping and cutting of the cord and controlled cord traction<sup>3</sup>.
- 1.8.5 Women should be informed that active management of the third stage reduces the risk of maternal haemorrhage and shortens the third stage.
- 1.8.6 Women at low risk of postpartum haemorrhage who request physiological management of the third stage should be supported in their choice.
- 1.8.7 Changing from physiological management to active management of the third stage is indicated in the case of:
- haemorrhage
  - failure to deliver the placenta within 1 hour
  - the woman's desire to artificially shorten the third stage.
- 1.8.8 Pulling the cord or palpating the uterus should only be carried out after administration of oxytocin as part of active management.
- 1.8.9 In the third stage of labour neither umbilical oxytocin infusion nor prostaglandin should be used routinely.

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<sup>3</sup> At the time of publication (September 2007), oxytocin did not have UK marketing authorisation for this indication. Informed consent should be obtained and documented.

## **1.9      *Normal labour: care of the baby and woman immediately after birth***

### **Initial assessment of the newborn baby and mother–infant bonding**

- 1.9.1      The Apgar score at 1 and 5 minutes should be recorded routinely for all births.
- 1.9.2      If the baby is born in poor condition (the Apgar score at 1 minute is 5 or less), then the time to the onset of regular respirations should be recorded and the cord double-clamped to allow paired cord blood gases to be taken. The Apgar score should continue to be recorded until the baby's condition is stable.
- 1.9.3      Women should be encouraged to have skin-to-skin contact with their babies as soon as possible after the birth<sup>4</sup>.
- 1.9.4      In order to keep the baby warm, he or she should be dried and covered with a warm, dry blanket or towel while maintaining skin-to-skin contact with the woman.
- 1.9.5      Separation of a woman and her baby within the first hour of the birth for routine postnatal procedures, for example weighing, measuring and bathing, should be avoided unless these measures are requested by the woman, or are necessary for the immediate care of the baby<sup>4</sup>.
- 1.9.6      Initiation of breastfeeding should be encouraged as soon as possible after the birth, ideally within 1 hour<sup>4</sup>.
- 1.9.7      Head circumference, body temperature and birth weight should be recorded soon after the first hour following birth.
- 1.9.8      An initial examination should be undertaken by a healthcare professional to detect any major physical abnormality and to identify any problems that require referral.

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<sup>4</sup> Recommendations relating to immediate postnatal care (within 2 hours of birth) have been extracted from 'Routine postnatal care of women and their babies' (NICE clinical guideline 37). Please see NICE clinical guideline 37 for further guidance on care after birth.

- 1.9.9 Any examination or treatment of the baby should be undertaken with the consent and in the presence of the parents or, if this is not possible, with their knowledge.

### **Initial assessment of the woman following birth**

- 1.9.10 Observations taken following the birth of the baby should include:

- maternal observation – temperature, pulse, blood pressure, uterine contraction, lochia
- examination of placenta and membranes – assessment of their condition, structure, cord vessels and completeness
- early assessment of maternal emotional/psychological condition in response to labour and birth
- successful voiding of the woman's bladder.

### **Perineal care**

- 1.9.11 Perineal or genital trauma caused by either tearing or episiotomy should be defined as follows:

- first degree – injury to skin only
- second degree – injury to the perineal muscles but not the anal sphincter
- third degree – injury to the perineum involving the anal sphincter complex:
  - 3a – less than 50% of external anal sphincter thickness torn
  - 3b – more than 50% of external anal sphincter thickness torn
  - 3c – internal anal sphincter torn.
- fourth degree – injury to the perineum involving the anal sphincter complex (external and internal anal sphincter) and anal epithelium.

- 1.9.12 Before assessing for genital trauma, healthcare professionals should:

- explain to the woman what they plan to do and why

- offer inhalational analgesia
  - ensure good lighting
  - position the woman so that she is comfortable and so that the genital structures can be seen clearly.
- 1.9.13 The initial examination should be performed gently and with sensitivity and may be done in the immediate period following birth.
- 1.9.14 If genital trauma is identified following birth, further systematic assessment should be carried out, including a rectal examination.
- 1.9.15 Systematic assessment of genital trauma should include:
- further explanation of what the healthcare professional plans to do and why
  - confirmation by the woman that tested effective local or regional analgesia is in place
  - visual assessment of the extent of perineal trauma to include the structures involved, the apex of the injury and assessment of bleeding
  - a rectal examination to assess whether there has been any damage to the external or internal anal sphincter if there is any suspicion that the perineal muscles are damaged.
- 1.9.16 The timing of this systematic assessment should not interfere with mother–infant bonding unless the woman has bleeding that requires urgent attention.
- 1.9.17 The woman should usually be in lithotomy to allow adequate visual assessment of the degree of the trauma and for the repair. This position should only be maintained for as long as is necessary for the systematic assessment and repair.
- 1.9.18 The woman should be referred to a more experienced healthcare professional if uncertainty exists as to the nature or extent of trauma sustained.

- 1.9.19 The systematic assessment and its results should be fully documented, possibly pictorially.
- 1.9.20 All relevant healthcare professionals should attend training in perineal/genital assessment and repair, and ensure that they maintain these skills.
- 1.9.21 Repair of the perineum should be undertaken as soon as possible to minimise the risk of infection and blood loss.
- 1.9.22 Perineal repair should only be undertaken with tested effective analgesia in place using infiltration with up to 20 ml of 1% lidocaine or equivalent, or topping up the epidural (spinal anaesthesia may be necessary).
- 1.9.23 If the woman reports inadequate pain relief at any point this should immediately be addressed.
- 1.9.24 Women should be advised that in the case of first-degree trauma, the wound should be sutured in order to improve healing, unless the skin edges are well opposed.
- 1.9.25 Women should be advised that in the case of second-degree trauma, the muscle should be sutured in order to improve healing.
- 1.9.26 If the skin is opposed following suturing of the muscle in second-degree trauma, there is no need to suture it.
- 1.9.27 Where the skin does require suturing, this should be undertaken using a continuous subcuticular technique.
- 1.9.28 Perineal repair should be undertaken using a continuous non-locked suturing technique for the vaginal wall and muscle layer.
- 1.9.29 An absorbable synthetic suture material should be used to suture the perineum.

- 1.9.30 Rectal non-steroidal anti-inflammatory drugs should be offered routinely following perineal repair of first- and second-degree trauma provided these drugs are not contraindicated.
- 1.9.31 The following basic principles should be observed when performing perineal repairs:
- Perineal trauma should be repaired using aseptic techniques.
  - Equipment should be checked and swabs and needles counted before and after the procedure.
  - Good lighting is essential to see and identify the structures involved.
  - Difficult trauma should be repaired by an experienced practitioner in theatre under regional or general anaesthesia. An indwelling catheter should be inserted for 24 hours to prevent urinary retention.
  - Good anatomical alignment of the wound should be achieved, and consideration given to the cosmetic results.
  - Rectal examination should be carried out after completing the repair to ensure that suture material has not been accidentally inserted through the rectal mucosa.
  - Following completion of the repair, an accurate detailed account should be documented covering the extent of the trauma, the method of repair and the materials used.
  - Information should be given to the woman regarding the extent of the trauma, pain relief, diet, hygiene and the importance of pelvic-floor exercises.

## **1.10 *Prelabour rupture of the membranes at term***

- 1.10.1 There is no reason to carry out a speculum examination with a certain history of rupture of the membranes at term.
- 1.10.2 Women with an uncertain history of prelabour rupture of the membranes should be offered a speculum examination to

determine whether their membranes have ruptured. Digital vaginal examination in the absence of contractions should be avoided.

1.10.3 Women presenting with prelabour rupture of the membranes at term should be advised that:

- the risk of serious neonatal infection is 1% rather than 0.5% for women with intact membranes
- 60% of women with prelabour rupture of the membranes will go into labour within 24 hours
- induction of labour<sup>5</sup> is appropriate approximately 24 hours after rupture of the membranes.

1.10.4 Until the induction is commenced or if expectant management beyond 24 hours is chosen by the woman:

- lower vaginal swabs and maternal C-reactive protein should not be offered
- to detect any infection that may be developing women should be advised to record their temperature every 4 hours during waking hours and to report immediately any change in the colour or smell of their vaginal loss
- women should be informed that bathing or showering are not associated with an increase in infection, but that having sexual intercourse may be.

1.10.5 Fetal movement and heart rate should be assessed at initial contact and then every 24 hours following rupture of the membranes while the woman is not in labour, and the woman should be advised to report immediately any decrease in fetal movements.

1.10.6 If labour has not started 24 hours after rupture of the membranes, women should be advised to give birth where there is access to

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<sup>5</sup> Care of women who have their labour induced is covered by 'Induction of labour' (Inherited clinical guideline D).

neonatal services and advised to stay in hospital for at least 12 hours following the birth.

- 1.10.7 If there are no signs of infection in the woman, antibiotics should not be given to either the woman or the baby, even if the membranes have been ruptured for over 24 hours.
- 1.10.8 If there is evidence of infection in the woman, a full course of broad-spectrum intravenous antibiotics should be prescribed.
- 1.10.9 Women with prelabour rupture of the membranes should be asked to inform their healthcare professionals immediately of any concerns they have about their baby's wellbeing in the first 5 days following birth, particularly in the first 12 hours when the risk of infection is greatest.
- 1.10.10 Blood, cerebrospinal fluid and/or surface culture tests should not be performed in an asymptomatic baby.
- 1.10.11 Asymptomatic term babies born to women with prelabour rupture of the membranes (more than 24 hours before labour) should be closely observed for the first 12 hours of life (at 1 hour, 2 hours and then 2-hourly for 10 hours). These observations should include:
- general wellbeing
  - chest movements and nasal flare
  - skin colour including perfusion, by testing capillary refill
  - feeding
  - muscle tone
  - temperature
  - heart rate and respiration.
- 1.10.12 A baby with any symptom of possible sepsis, or born to a woman who has evidence of chorioamnionitis, should immediately be referred to a neonatal care specialist.

## **1.11 *Meconium-stained liquor***

### **Monitoring and treatment of women with meconium-stained liquor**

- 1.11.1 Continuous EFM should be advised for women with significant meconium-stained liquor, which is defined as either dark green or black amniotic fluid that is thick or tenacious, or any meconium-stained amniotic fluid containing lumps of meconium.
- 1.11.2 Continuous EFM should be considered for women with light meconium-stained liquor depending on a risk assessment which should include as a minimum their stage of labour, volume of liquor, parity, the FHR and, where applicable, transfer pathway.
- 1.11.3 Amnioinfusion should not be used for the treatment of women with meconium-stained liquor.

### **Resuscitation of babies with meconium-stained liquor**

- 1.11.4 If significant meconium-stained liquor is identified, healthcare professionals trained in FBS should be available in labour and healthcare professionals trained in advanced neonatal life support should be readily available for the birth.
- 1.11.5 Suctioning of the nasopharynx and oropharynx prior to birth of the shoulders and trunk should not be carried out.
- 1.11.6 The upper airways should only be suctioned if the baby has thick or tenacious meconium present in the oropharynx.
- 1.11.7 If the baby has depressed vital signs, laryngoscopy and suction under direct vision should be carried out by a healthcare professional trained in advanced neonatal life support.
- 1.11.8 If there has been significant meconium staining and the baby is in good condition, the baby should be closely observed for signs of respiratory distress. These observations should be performed at 1 and 2 hours of age and then 2-hourly until 12 hours of age, and should include:

- general wellbeing
- chest movements and nasal flare
- skin colour including perfusion, by testing capillary refill
- feeding
- muscle tone
- temperature
- heart rate and respiration.

1.11.9 If there has been light meconium staining, the baby should be similarly observed by the healthcare professional at 1 and 2 hours and should be reviewed by a neonatologist if the baby's condition causes concern at any time.

## **1.12 *Complicated labour: monitoring babies in labour***<sup>6</sup>

### **EFM and record-keeping**

1.12.1 In order to ensure accurate record-keeping regarding EFM:

- The date and time clocks on the EFM machine should be correctly set.
- Traces should be labelled with the mother's name, date and hospital number.
- Any intrapartum events that may affect the FHR should be noted at the time on the FHR trace, which should be signed and the date and time noted (for example, vaginal examination, FBS or siting of an epidural).
- Any member of staff who is asked to provide an opinion on a trace should note their findings on both the trace and the woman's medical records along with the date, time and signature.
- Following birth, the healthcare professional should sign and note the date, time and mode of birth on the FHR trace.

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<sup>6</sup> This guideline updates and replaces 'The use of electronic fetal monitoring: The use and interpretation of cardiotocography in intrapartum fetal surveillance' (Inherited clinical guideline C), issued in 2001.

- The FHR trace should be stored securely with the woman's medical records at the end of the monitoring process.

### **Interpretation of FHR traces/cardiocotographs**

1.12.2 The recommended definitions and classifications of the FHR trace/cardiocotograph produced during EFM are shown in tables 5 and 6.

**Table 5 Definition of normal, suspicious and pathological FHR traces**

<b>Category</b>	<b>Definition</b>
Normal	An FHR trace in which all four features are classified as reassuring
Suspicious	An FHR trace with one feature classified as non-reassuring and the remaining features classified as reassuring
Pathological	An FHR trace with two or more features classified as non-reassuring or one or more classified as abnormal

**Table 6 Classification of FHR trace features**

Feature	Baseline (bpm)	Variability (bpm)	Decelerations	Accelerations
Reassuring	110–160	≥ 5	None	Present
Non-reassuring	100–109 161–180	< 5 for 40–90 minutes	Typical variable decelerations with over 50% of contractions, occurring for over 90 minutes Single prolonged deceleration for up to 3 minutes	The absence of accelerations with otherwise normal trace is of uncertain significance
Abnormal	< 100 > 180 Sinusoidal pattern ≥ 10 minutes	< 5 for 90 minutes	Either atypical variable decelerations with over 50% of contractions or late decelerations, both for over 30 minutes Single prolonged deceleration for more than 3 minutes	

Further information about classifying FHR traces is given below.

- If repeated accelerations are present with reduced variability, the FHR trace should be regarded as reassuring.
- True early uniform decelerations are rare and benign, and therefore they are not significant.
- Most decelerations in labour are variable.
- If a bradycardia occurs in the baby for more than 3 minutes, urgent medical aid should be sought and preparations should be made to urgently expedite the birth of the baby, classified as a category 1 birth. This could include moving the woman to theatre if the fetal heart has not recovered by 9 minutes. If the fetal heart recovers within 9 minutes the decision to deliver should be reconsidered in conjunction with the woman if reasonable.
- A tachycardia in the baby of 160–180 bpm, where accelerations are present and no other adverse features appear, should not be regarded as suspicious. However, an increase in the baseline heart rate, even within the normal range, with other non-reassuring or abnormal features should increase concern.

1.12.3 For women having continuous EFM, a documented systematic assessment based on these definitions and classifications should be undertaken every hour.

1.12.4 During episodes of abnormal FHR patterns when the woman is lying supine she should be advised to adopt the left-lateral position.

1.12.5 Prolonged use of maternal facial oxygen therapy may be harmful to the baby and should be avoided. There is no research evidence evaluating the benefits or risks associated with the short-term use of maternal facial oxygen therapy in cases of suspected fetal compromise.

- 1.12.6 In the presence of abnormal FHR patterns and uterine hypercontractility not secondary to oxytocin infusion, tocolysis should be considered. A suggested regimen is subcutaneous terbutaline 0.25 mg<sup>7</sup>.
- 1.12.7 In cases of suspected or confirmed acute fetal compromise, delivery should be accomplished within a time appropriate for the clinical condition.
- 1.12.8 Continuous EFM in the presence of oxytocin:
- If the FHR trace is normal, oxytocin may be continued until the woman is experiencing 4 or 5 contractions every 10 minutes. Oxytocin should be reduced if contractions occur more frequently than 5 contractions in 10 minutes.
  - If the FHR trace is classified as suspicious, this should be reviewed by an obstetrician and the oxytocin dose should only continue to increase to achieve 4 or 5 contractions every 10 minutes.
  - If the FHR trace is classified as pathological, oxytocin should be stopped and a full assessment of the fetal condition undertaken by an obstetrician before oxytocin is recommenced.

#### **Adjuncts to the use of continuous EFM including FBS**

- 1.12.9 Digital stimulation of the fetal scalp by the healthcare professional during a vaginal examination should be considered as an adjunct to continuous EFM.
- 1.12.10 If fetal death is suspected despite the presence of an apparently recorded FHR, then fetal viability should be confirmed with real-time ultrasound assessment.
- 1.12.11 FBS should be advised in the presence of a pathological FHR trace, unless there is clear evidence of acute compromise.

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<sup>7</sup> At the time of publication (September 2007), terbutaline did not have UK marketing authorisation for this indication. Informed consent should be obtained and documented.

- 1.12.12 Where assisted birth is contemplated because of an abnormal FHR pattern, in cases of suspected fetal acidosis FBS should be undertaken in the absence of technical difficulties or any contraindications.
- 1.12.13 Where there is clear evidence of acute fetal compromise (for example, prolonged deceleration greater than 3 minutes), FBS should not be undertaken and urgent preparations to expedite birth should be made.
- 1.12.14 Fetal blood samples should be taken with the woman in the left-lateral position.
- 1.12.15 The classification of FBS results shown in table 7 is recommended.

**Table 7 The classification of fetal blood sample (FBS) results**

FBS result (pH)	Interpretation
$\geq 7.25$	Normal FBS result
7.21–7.24	Borderline FBS result
$\leq 7.20$	Abnormal FBS result

These results should be interpreted taking into account the previous pH measurement, the rate of progress in labour and the clinical features of the woman and baby.

- 1.12.16 After an abnormal FBS result, consultant obstetric advice should be sought.
- 1.12.17 After a normal FBS result, sampling should be repeated no more than 1 hour later if the FHR trace remains pathological, or sooner if there are further abnormalities.
- 1.12.18 After a borderline FBS result, sampling should be repeated no more than 30 minutes later if the FHR trace remains pathological or sooner if there are further abnormalities.
- 1.12.19 The time taken to take a fetal blood sample needs to be considered when planning repeat samples.

- 1.12.20 If the FHR trace remains unchanged and the FBS result is stable after the second test, a third/further sample may be deferred unless additional abnormalities develop on the trace.
- 1.12.21 Where a third FBS is considered necessary, consultant obstetric opinion should be sought.
- 1.12.22 Contraindications to FBS include:
- maternal infection (for example, HIV, hepatitis viruses and herpes simplex virus)
  - fetal bleeding disorders (for example, haemophilia)
  - prematurity (less than 34 weeks).

**Risk management when using continuous EFM in labour**

- 1.12.23 Clinicians should take into account the time that it will take to achieve birth by both instrumental vaginal birth and caesarean section when making decisions regarding concern over fetal wellbeing during labour.
- 1.12.24 FHR traces should be kept for 25 years and, where possible, stored electronically.
- 1.12.25 In cases where there is concern that the baby may suffer developmental delay, FHR traces should be photocopied and stored indefinitely in case of possible adverse outcomes.
- 1.12.26 Tracer systems should be available for all FHR traces if stored separately from women's records.
- 1.12.27 Tracer systems should be developed to ensure that FHR traces removed for any purpose (such as risk management or for teaching purposes) can always be located.
- 1.12.28 Paired cord blood gases do not need to be taken routinely. They should be taken when there has been concern about the baby either in labour or immediately following birth.

- 1.12.29 An additional clamp to facilitate double-clamping of the cord should be available at all birth settings.

### **1.13 *Complicated labour: first stage***

#### **Definition of delay in the established first stage**

A diagnosis of delay in the established first stage of labour needs to take into consideration all aspects of progress in labour and should include:

- cervical dilatation of less than 2 cm in 4 hours for first labours
- cervical dilatation of less than 2 cm in 4 hours or a slowing in the progress of labour for second or subsequent labours
- descent and rotation of the fetal head
- changes in the strength, duration and frequency of uterine contractions (recommendation 1.6.5).

#### **Perceived delay in the established first stage**

- 1.13.1 Where delay in the established first stage is suspected the following should be considered:

- parity
- cervical dilatation and rate of change
- uterine contractions
- station and position of presenting part
- the woman's emotional state
- referral to the appropriate healthcare professional.

Women should be offered support, hydration, and appropriate and effective pain relief.

- 1.13.2 If delay in the established first stage of labour is suspected, amniotomy should be considered for all women with intact membranes, following explanation of the procedure and advice that

it will shorten her labour by about an hour and may increase the strength and pain of her contractions.

- 1.13.3 Whether or not a woman has agreed to an amniotomy, all women with suspected delay in the established first stage of labour should be advised to have a vaginal examination 2 hours later, and if progress is less than 1 cm a diagnosis of delay is made.
- 1.13.4 In women with intact membranes in whom delay in the established first stage of labour is confirmed, amniotomy should be advised to the woman, and she should be advised to have a repeat vaginal examination 2 hours later whether her membranes are ruptured or intact.
- 1.13.5 When delay in the established first stage of labour is confirmed in nulliparous women, advice should be sought from an obstetrician and the use of oxytocin should be considered. The woman should be informed that the use of oxytocin following spontaneous or artificial rupture of the membranes will bring forward her time of birth but will not influence the mode of birth or other outcomes.
- 1.13.6 Multiparous women with confirmed delay in the first stage should be seen by an obstetrician who should make a full assessment, including an abdominal palpation and vaginal examination, before making a decision about the use of oxytocin.
- 1.13.7 All women with delay in the established first stage of labour should be offered support and effective pain relief.
- 1.13.8 Women should be informed that oxytocin will increase the frequency and strength of their contractions and that its use will mean their baby should be monitored continuously. Women should be offered an epidural before oxytocin is started.
- 1.13.9 Where oxytocin is used, the time between increments of the dose should be no more frequent than every 30 minutes. Oxytocin

should be increased until there are 4–5 contractions in 10 minutes.  
(See also section 1.12 on monitoring babies in labour.)

- 1.13.10 The woman should be advised to have a vaginal examination 4 hours after commencing oxytocin in established labour. If there is less than 2 cm progress after 4 hours of oxytocin, further obstetric review is required to consider caesarean section. If there is 2 cm or more progress, vaginal examinations should be advised 4-hourly.
- 1.13.11 Amniotomy alone for suspected delay in the established first stage of labour is not an indication to commence continuous EFM.
- 1.13.12 Where a diagnosis of delay in the established first stage of labour is made, continuous EFM should be offered.
- 1.13.13 Continuous EFM should be used when oxytocin is administered for augmentation.

## **1.14 *Complicated labour: second stage***

### **Duration and definition of delay in the second stage**

Nulliparous women:

- Birth would be expected to take place within 3 hours of the start of the active second stage in most women.
- A diagnosis of delay in the active second stage should be made when it has lasted 2 hours and women should be referred to a healthcare professional trained to undertake an operative vaginal birth if birth is not imminent (recommendation 1.7.2).

Parous women:

- Birth would be expected to take place within 2 hours of the start of the active second stage in most women.
- A diagnosis of delay in the active second stage should be made when it has lasted 1 hour and women should be referred to a

healthcare professional trained to undertake an operative vaginal birth if birth is not imminent (recommendation 1.7.3).

- 1.14.1 Where there is delay in the second stage of labour, or if the woman is excessively distressed, support and sensitive encouragement and the woman's need for analgesia/anaesthesia are particularly important.
- 1.14.2 In nulliparous women, if after 1 hour of active second stage progress is inadequate, delay is suspected. Following vaginal examination, amniotomy should be offered if the membranes are intact.
- 1.14.3 Women with confirmed delay in the second stage should be assessed by an obstetrician but oxytocin should not be started.
- 1.14.4 Following initial obstetric assessment for women with delay in the second stage of labour, ongoing obstetric review should be maintained every 15–30 minutes.

#### **Instrumental birth and delayed second stage**

- 1.14.5 Instrumental birth should be considered if there is concern about fetal wellbeing, or for prolonged second stage.
- 1.14.6 On rare occasions, the woman's need for help in the second stage may be an indication to assist by offering instrumental birth when supportive care has not helped.
- 1.14.7 The choice of instrument depends on a balance of clinical circumstance and practitioner experience.
- 1.14.8 Instrumental birth is an operative procedure that should be undertaken with tested effective anaesthesia.
- 1.14.9 If a woman declines anaesthesia, a pudendal block combined with local anaesthetic to the perineum can be used during instrumental birth.

- 1.14.10 Where there is concern about fetal compromise, either tested effective anaesthesia or, if time does not allow this, a pudendal block combined with local anaesthetic to the perineum can be used during instrumental birth.
- 1.14.11 Caesarean section should be advised if vaginal birth is not possible<sup>8</sup>.

## **1.15      *Complicated labour: immediate care of newborn***

### **Basic neonatal resuscitation**

- 1.15.1 All relevant healthcare professionals caring for women during birth should attend a course in neonatal resuscitation at least annually, which is consistent with the algorithm adopted in the 'Newborn life support course' developed by the Resuscitation Council (UK)<sup>9</sup>.
- 1.15.2 Basic resuscitation of newborn babies should be initiated with air.
- 1.15.3 Oxygen should be available for babies who do not respond once adequate ventilation has been established.
- 1.15.4 Emergency referral pathways for both the woman and the baby should be developed and implemented for all birth settings.

## **1.16      *Complicated labour: third stage***

### **Prolonged third stage**

The third stage of labour is diagnosed as prolonged if not completed within 30 minutes of the birth of the baby with active management and 60 minutes with physiological management (recommendation 1.8.2).

### **Treatment of women with a retained placenta**

- 1.16.1 Intravenous access should always be secured in women with a retained placenta.

<sup>8</sup> See 'Caesarean section' (NICE clinical guideline 13).

<sup>9</sup> Available from [www.resus.org.uk/siteindx.htm](http://www.resus.org.uk/siteindx.htm)

- 1.16.2 Intravenous infusion of oxytocin should not be used to assist the delivery of the placenta.
- 1.16.3 For women with a retained placenta oxytocin injection into the umbilical vein with 20 IU of oxytocin in 20 ml of saline is recommended, followed by proximal clamping of the cord.
- 1.16.4 If the placenta is still retained 30 minutes after oxytocin injection, or sooner if there is concern about the woman's condition, women should be offered an assessment of the need to remove the placenta. Women should be informed that this assessment can be painful and they should be advised to have analgesia or even anaesthesia for this assessment.
- 1.16.5 If a woman reports inadequate pain relief during the assessment, the healthcare professional must immediately stop the examination and address this need.
- 1.16.6 If manual removal of the placenta is required, this must be carried out under effective regional anaesthesia (or general anaesthesia when necessary).

### **Risk factors for postpartum haemorrhage**

- 1.16.7 Women with risk factors for postpartum haemorrhage should be advised to give birth in an obstetric unit where more emergency treatment options are available.
- Antenatal risk factors:
    - previous retained placenta or postpartum haemorrhage
    - maternal haemoglobin level below 8.5 g/dl at onset of labour
    - body mass index greater than 35 kg/m<sup>2</sup>
    - grand multiparity (parity 4 or more)
    - antepartum haemorrhage
    - overdistention of the uterus (for example, multiple pregnancy, polyhydramnios or macrosomia)
    - existing uterine abnormalities

- low-lying placenta
- maternal age (35 years or older).

- Risk factors in labour:

- induction
- prolonged first, second or third stage of labour
- oxytocin use
- precipitate labour
- operative birth or caesarean section.

1.16.8 If a woman has risk factors for postpartum haemorrhage, these should be highlighted in her notes and a care plan covering the third stage of labour should be made and discussed with the woman.

1.16.9 The unit should have strategies in place in order to respond quickly and appropriately should a postpartum haemorrhage occur.

### **Management of postpartum haemorrhage**

1.16.10 Immediate treatment for postpartum haemorrhage should include:

- calling for appropriate help
- uterine massage
- intravenous fluids
- uterotonics.

1.16.11 No particular uterotonic drug can be recommended over another for the treatment of postpartum haemorrhage.

- 1.16.12 Treatment combinations for postpartum haemorrhage might include repeat bolus of oxytocin (intravenous), ergometrine (intramuscular, or cautiously intravenously), intramuscular oxytocin with ergometrine (Syntometrine), misoprostol<sup>10</sup>, oxytocin infusion (Syntocinon) or carboprost (intramuscular).
- 1.16.13 Additional therapeutic options for the treatment of postpartum haemorrhage include tranexamic acid (intravenous) and rarely, in the presence of otherwise normal clotting factors, rFactor VIIa, after seeking advice from a haematologist<sup>10</sup>.
- 1.16.14 If possible, a member of the healthcare team should be allocated to remain with the woman and her partner during postpartum haemorrhage to ensure communication and offer support throughout the emergency situation.
- 1.16.15 No particular surgical procedure can be recommended above another for the treatment of postpartum haemorrhage.

## 2 Notes on the scope of the guidance

NICE guidelines are developed in accordance with a scope that defines what the guideline will and will not cover. The scope of this guideline is available from [www.nice.org.uk/page.aspx?o=243361](http://www.nice.org.uk/page.aspx?o=243361)

The guideline is intended to develop guidance for healthy women and their babies in labour. Therefore the following were excluded from the scope:

- Women or their babies in suspected or confirmed preterm labour (before 37 weeks gestation); women with an intrauterine fetal death; women with coexisting severe morbidities such as pre-eclampsia or diabetes; women

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<sup>10</sup> At the time of publication (September 2007), misoprostol and rFactor VIIa did not have UK marketing authorisation for this indication. Informed consent should be obtained and documented; however, if this is not possible, follow the Department of Health guidelines – ‘Reference guide to consent for examination or treatment’ (2001) (available from [www.dh.gov.uk](http://www.dh.gov.uk)). It may be appropriate to get consent in the antenatal period.

who have multiple pregnancies; women with intrauterine growth retardation of the unborn baby.

- Women who have been covered in other guidelines, for example, women who have their labour induced ('Induction of labour' [Inherited clinical guideline D]); women who have a caesarean birth or with breech presentation ('Caesarean section' [NICE clinical guideline 13]).
- Techniques for operative delivery or repair of third- or fourth-degree perineal trauma; additional care for women with known or suspected infectious comorbidities such as group B streptococcus, HIV or genital herpes virus.

#### **How this guideline was developed**

NICE commissioned the National Collaborating Centre for Women's and Children's Health to develop this guideline. The Centre established a Guideline Development Group (see appendix A), which reviewed the evidence and developed the recommendations. An independent Guideline Review Panel oversaw the development of the guideline (see appendix B).

There is more information in the booklet: 'The guideline development process: an overview for stakeholders, the public and the NHS' (second edition, published April 2006), which is available from [www.nice.org.uk/guidelinesprocess](http://www.nice.org.uk/guidelinesprocess) or by telephoning 0870 1555 455 (quote reference N1233).

### **3 Implementation**

The Healthcare Commission assesses the performance of NHS organisations in meeting core and developmental standards set by the Department of Health in 'Standards for better health', issued in July 2004. Implementation of clinical guidelines forms part of the developmental standard D2. Core standard C5 says that national agreed guidance should be taken into account when NHS organisations are planning and delivering care.

NICE has developed tools to help organisations implement this guidance (listed below). These are available on our website ([www.nice.org.uk/CG055](http://www.nice.org.uk/CG055)).

- Slides highlighting key messages for local discussion.
- Costing tools.
- Implementation advice on how to put the guidance into practice and national initiatives which support this locally.
- Audit criteria to monitor local practice.

## **4 Research recommendations**

The Guideline Development Group has made the following recommendations for research, based on its review of evidence, to improve NICE guidance and patient care in the future. The Guideline Development Group's full set of research recommendations is detailed in the full guideline (see section 5).

### **4.1 *Planning place of birth***

The best possible studies comparing different places of birth should be undertaken in the UK. Prospective research to assess clinical outcomes, including safety, for all places of birth should be undertaken, as well as qualitative data collection to assess women's experiences of birth.

#### **Why this is important**

Please refer to chapter 3 of the full guideline (see section 5).

### **4.2 *Wellbeing of women***

Studies are needed that investigate the components affecting a woman's satisfaction with her birth experience, including her emotional and psychological wellbeing. A robust method of assessing a woman's satisfaction is also needed.

#### **Why this is important**

Women's experiences of birth vary enormously and are influenced by many factors including her expectations, her degree of preparation, the complexity of the birth and the severity of her pain. Most studies investigated the effectiveness of any interventions used during birth, but insufficiently reported women's psychological and emotional wellbeing and their birth experiences. The findings consistently showed that measurement of these factors was not

robustly undertaken. A standardised method to measure and quantify women's psychological and emotional wellbeing and their birth experiences is urgently required to support any study investigating the effectiveness of interventions, techniques or strategies during birth.

### **4.3      *Delay in the first stage of labour***

Studies are needed that investigate the effectiveness of any strategies to increase spontaneous vaginal birth where diagnosis is made of delay in the first stage of labour.

#### **Why this is important**

Delay in the first stage of labour has been defined in a number of ways and no universal consensus has been achieved. Traditionally delay has been defined largely by the rate of cervical progress without taking into account either the woman's uterine activity and descent/rotation of the baby's head during birth. Although it is acknowledged that the duration of labour is dependent on parity, clinical practice and local labour guidelines rarely make that distinction. Studies included in the guideline attempted to assess labour augmentation by amniotomy and/or oxytocin for delayed first stage of labour, although the combination, timing and dose of these interventions are scarcely investigated. Few good quality studies have investigated the effectiveness of non-invasive techniques such as breathing and relaxation, massage, complementary therapies or immersion in water. Strategies to identify the best combination of regimens to prevent delay or appropriately expedite the first stage of labour when necessary to improve the wellbeing of women and their babies should be investigated urgently.

## **5            Other versions of this guideline**

### **5.1        *Full guideline***

The full guideline, 'Intrapartum care: care of healthy women and their babies during childbirth', contains details of the methods and evidence used to develop the guideline. It is published by the National Collaborating Centre for Women's and Children's Health, and is available from [www.ncc-wch.org.uk](http://www.ncc-wch.org.uk),

our website ([www.nice.org.uk/CG055fullguideline](http://www.nice.org.uk/CG055fullguideline)) and the National Library for Health ([www.nlh.nhs.uk](http://www.nlh.nhs.uk)).

## **5.2 Quick reference guide**

A quick reference guide for healthcare professionals is also available from [www.nice.org/CG055quickrefguide](http://www.nice.org/CG055quickrefguide)

For printed copies, phone the NHS Response Line on 0870 1555 455 (quote reference number N1326).

## **5.3 'Understanding NICE guidance'**

A version of this guideline for healthy women during childbirth and their carers ('Understanding NICE guidance') is available from

[www.nice.org.uk/CG055publicinfo](http://www.nice.org.uk/CG055publicinfo)

For printed copies, phone the NHS Response Line on 0870 1555 455 (quote reference number N1327).

## **6 Related NICE guidance**

Antenatal and postnatal mental health: clinical management and service guidance. NICE clinical guideline 45 (2007). Available from

[www.nice.org.uk/CG045](http://www.nice.org.uk/CG045)

Postnatal care: routine postnatal care of women and their babies. NICE clinical guideline 37 (2006). Available from [www.nice.org.uk/CG037](http://www.nice.org.uk/CG037)

Caesarean section. NICE clinical guideline 13 (2004). Available from

[www.nice.org.uk/CG013](http://www.nice.org.uk/CG013)

Antenatal care: routine care for the healthy pregnant woman. NICE clinical guideline 6 (2003). Available from [www.nice.org.uk/CG006](http://www.nice.org.uk/CG006)

Infection control: prevention of healthcare-associated infection in primary and community care. NICE clinical guideline 2 (2003). Available from

[www.nice.org.uk/CG002](http://www.nice.org.uk/CG002)

Induction of labour. Inherited clinical guideline D (2001). Available from [www.nice.org.uk/guidelineD](http://www.nice.org.uk/guidelineD)

NICE is developing the following guidance (details available from [www.nice.org.uk](http://www.nice.org.uk)):

Diabetes in pregnancy: management of diabetes and its complications from pre-conception to the postnatal period. NICE clinical guideline (publication expected March 2008)

Maternal and child nutrition: guidance for midwives, health visitors, pharmacists and other primary care services to improve the nutrition of pregnant and breastfeeding mothers and children in low income households. NICE public health programme (publication expected March 2008)

## **7            Updating the guideline**

NICE clinical guidelines are updated as needed so that recommendations take into account important new information. We check for new evidence 2 and 4 years after publication, to decide whether all or part of the guideline should be updated. If important new evidence is published at other times, we may decide to do a more rapid update of some recommendations.

## **Appendix A: The Guideline Development Group**

### **Ms Sara Kenyon**

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Consultant Neonatologist, Medway Hospital

### **Mr Simon Grant**

Consultant in Obstetrics and Fetal Medicine, Southmead Hospital

### **Mrs Gill Gyte** (resigned June 2007)

Women's Representative

### **Ms Jayne Jempson**

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### **Ms Carolyn Markham**

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### **Dr Geraldine O'Sullivan**

Obstetric Anaesthetist, St Thomas Hospital

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### **Ms Maureen Treadwell**

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### **Professor Derek Tuffnell**

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**Mrs Samantha Vahidi**

Senior Work Programme Coordinator, National Collaborating Centre for Women's and Children's Health

## **Appendix B: The Guideline Review Panel**

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring adherence to NICE guideline development processes. In particular, the panel ensures that stakeholder comments have been adequately considered and responded to. The panel includes members from the following perspectives: primary care, secondary care, lay, public health and industry.

### **Dr John Hyslop (Chair)**

Consultant Radiologist, Royal Cornwall NHS Trust

### **Dr Ash Paul (from Feb 2007)**

Deputy Medical Director, Health Commission Wales (Specialist Services)

### **Mr John Seddon (from June 2007)**

Chair, V.O.I.C.E.S.

### **Miss Amanda Wilde (until March 2007)**

Industry Representative

## **Appendix C: The algorithms**

A care pathway can be found in the quick reference guide, available from [www.nice.org.uk/CG055quickrefguide](http://www.nice.org.uk/CG055quickrefguide)