NICE National Institute for Health and Care Excellence

NICE guideline

Intrapartum care for women with existing medical conditions or obstetric complications and their babies

NICE guideline

Published: 6 March 2019
nice.org.uk/guidance/ng121

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Contents

Overview 6

Who is it for? 6

Recommendations 7

1.1 Information for women with existing medical conditions 7

1.2 Planning for intrapartum care with women with existing medical conditions – involving a multidisciplinary team 8

1.3 Heart disease 9

1.4 Asthma 20

1.5 Long-term systemic steroids 20

1.6 Bleeding disorders 21

1.7 Subarachnoid haemorrhage or arteriovenous malformation of the brain 25

1.8 Acute kidney injury or chronic kidney disease 27

1.9 Obesity 30

1.10 Information for women with obstetric complications or no antenatal care 32

1.11 Risk assessment for women with obstetric complications or no antenatal care 33

1.12 Pyrexia 36

1.13 Sepsis 36

1.14 Intrapartum haemorrhage 42

1.15 Breech presenting in labour 45

1.16 Small-for-gestational-age baby 46

1.17 Large-for-gestational-age baby 46

1.18 No antenatal care 47

1.19 Previous caesarean section 50

1.20 Labour after 42 weeks of pregnancy 52

Terms used in this guideline 52

Recommendations for research 54

1 Subarachnoid haemorrhage or arteriovenous malformation of the brain 54

2 Needle siting in pregnant women who are obese 54

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

3 Obesity as a risk factor for perinatal morbidity and mortality 54

4 Risk assessment for women in labour with signs of sepsis 54

5 Previous caesarean section 55

Rationale and impact 56

Information for women with existing medical conditions 56

Planning for intrapartum care with women with existing medical conditions – involving a multidisciplinary team 56

Risk assessment for women with heart disease 57

Management of anticoagulation for women with mechanical heart valves 59

Mode of birth for women with heart disease 61

Fluid management for women with heart disease 62

Diagnosis and management of heart failure for all women in the intrapartum period 63

Anaesthesia and analgesia for women with heart disease 64

Management of the third stage of labour for women with heart disease 65

Analgesia for women with asthma 66

Prostaglandins for women with asthma 66

Long-term systemic steroids 67

Regional anaesthesia and analgesia for women with bleeding disorders 68

Modifying the birth plan according to platelet count or function 69

Management of the third stage of labour for women with bleeding disorders 70

Mode of birth and management of the second stage of labour for women with subarachnoid haemorrhage or arteriovenous malformation of the brain 70

Fluid management for women with kidney disease 72

Timing and mode of birth for women with kidney disease 73

Assessing fetal presentation early in labour for women with a BMI over 30 74

Anaesthesia and analgesia for women with a BMI over 30 75

Fetal monitoring for women with a BMI over 30 75

Position in labour for women with a BMI over 30 76

Equipment needs for women in labour with a BMI over 30 77

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Information for women with obstetric complications or no antenatal care 77
Risk assessment for women with obstetric complications or no antenatal care 78
Use of antipyretics for women in labour with a fever 80
Fetal blood sampling for women in labour with a fever 81
Mode of birth for women with sepsis or suspected sepsis 81
Anaesthesia for women in labour with sepsis and signs of organ dysfunction 82
Analgesia for women in labour with sepsis or suspected sepsis 83
Fetal monitoring for women in labour with sepsis or suspected sepsis 84
Antimicrobial treatment for women in labour with sepsis or suspected sepsis 85
Care for women with sepsis or suspected sepsis immediately after the birth 86
Intrapartum haemorrhage 86
Breech presenting in labour 87
Small-for-gestational-age baby 89
Large-for-gestational-age baby 89
No antenatal care 90
Previous caesarean section 91
Labour after 42 weeks of pregnancy 93
Context 94
Finding more information and resources 95

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Overview

This guideline covers care during labour and birth for women who need extra support because they have a medical condition or complications in their current or previous pregnancy. The guideline also covers women who have had no antenatal care. It aims to improve experiences and outcomes for women and their babies.

Who is it for?

- Pregnant women, their families and carers
- Obstetricians, midwives, anaesthetists and other healthcare professionals caring for women in labour
- Providers and commissioners of maternity services

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in your care.

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

Supporting women to make decisions about their care is particularly important during the intrapartum period. Healthcare professionals should ensure that women have the information they need to make decisions and to give consent in line with General Medical Council (GMC) guidance and the 2015 Montgomery ruling.

1.1 Information for women with existing medical conditions

1.1.1 Clarify with women with existing medical conditions whether and how they would like their birth companion(s) involved in discussions about care during labour and birth. Review this regularly.

1.1.2 Offer pregnant women with medical conditions and their birth companion(s) information about intrapartum care. This should include:

- general information as outlined in the NICE guideline on intrapartum care for healthy women and babies
- how their medical condition may affect their care
- how labour and birth may affect their medical condition
- how their medical condition and its management may affect the baby.

Information should be presented as recommended in the NICE guideline on patient experience in adult NHS services.

1.1.3 Offer information about intrapartum care in consultations before conception, if possible, and as early as possible during pregnancy. Allow extra time to discuss with the woman how her medical condition may affect her care.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.1.4 Information about intrapartum care should be offered to women with medical conditions by a member of the multidisciplinary team (see recommendation 1.2.2).

1.1.5 If a pregnant woman with a medical condition has not had any antenatal care (see section 1.18), give her information about intrapartum care at her first contact with healthcare services during pregnancy.

NICE has published a guideline on diabetes in pregnancy.

To find out why the committee made the recommendations on information for women with existing medical conditions and how they might affect practice, see rationale and impact.

1.2 Planning for intrapartum care with women with existing medical conditions – involving a multidisciplinary team

1.2.1 A multidisciplinary team led by a named healthcare professional should involve a pregnant woman with a medical condition in preparing an individualised plan for intrapartum care. The plan should be:

- formulated by following the principles of shared decision making outlined in the NICE guideline on patient experience in adult NHS services
- reviewed with the woman and her birth companion(s) as early as possible throughout pregnancy and on admission for birth
- updated with the woman if her medical condition changes during pregnancy
- shared with the woman's GP and teams providing her antenatal and intrapartum care.

1.2.2 For pregnant women with a medical condition, the multidisciplinary team may include, as appropriate:

- a midwife
- an obstetrician
- an obstetric anaesthetist
- an obstetric physician or clinician with expertise in caring for pregnant women with

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- the medical condition
- a clinician with expertise in the medical condition
- a specialty surgeon
- a critical care specialist
- a neonatologist
- the woman's GP
- allied health professionals.

To find out why the committee made the recommendations on planning for intrapartum care involving a multidisciplinary team and how they might affect practice, see rationale and impact.

1.3 Heart disease

Risk assessment for women with heart disease

1.3.1 Risk assessment for women with heart disease should follow the principles of multidisciplinary team working (outlined in recommendation 1.2.1). Include a cardiologist with expertise in managing heart disease in pregnant women in the multidisciplinary team discussions.

1.3.2 For women with heart disease diagnosed in the intrapartum period, urgent multidisciplinary discussions are needed to ensure that the woman is offered the same level of care as a woman with an existing diagnosis of heart disease and, where possible, that her preferences are taken into account.

1.3.3 Be aware that some women with heart disease are at low risk[1] of complications and their care should be in line with the NICE guideline on intrapartum care for healthy women and babies, whereas others need individualised specialist care.

1.3.4 For women with heart disease, reassess intrapartum risk regularly during pregnancy and the intrapartum period using all of the following:

- comprehensive clinical assessment, including history and physical examination

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- the modified World Health Organization (WHO) classification of risk[1]
- New York Heart Association (NYHA) functional class[2].

1.3.5 Offer the same investigations to pregnant women with heart disease as to women who are not pregnant. Review the results and act on them without delay.

> To find out why the committee made the recommendations on risk assessment for women with heart disease and how they might affect practice, see rationale and impact.

Management of anticoagulation for women with mechanical heart valves

1.3.6 When pregnancy is confirmed:

- involve women with mechanical heart valves in multidisciplinary discussion of plans for anticoagulation during the intrapartum period (see recommendations 1.2.1 and 1.2.2)
- consider including a haematologist in the multidisciplinary discussion
- explain to women that they will need individualised anticoagulation depending on their current treatment.

1.3.7 For women with mechanical heart valves who are taking warfarin in the third trimester, switch anticoagulation to low-molecular-weight heparin by 36^{+0} weeks of pregnancy or 2 weeks before planned birth (if this is earlier than 36^{+0} weeks). In hospital, consider doing this by:

- stopping warfarin, and 24 hours later, starting low-molecular-weight heparin using a twice-daily regimen at a dose based on the most recent weight available
- increasing the dose of low-molecular-weight heparin according to anti-Xa levels; this should be done by:
  - checking anti-Xa levels each day 3 to 4 hours after a dose of low-molecular-weight heparin, aiming for a peak anti-Xa level between 1.0 and 1.2 IU/ml
  - checking that the anti-Xa level before a dose of low-molecular-weight heparin (trough level) is above 0.6 IU/ml
- rechecking anti-Xa level weekly once the target anti-Xa level is achieved.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.3.8 For women with mechanical heart valves, stop therapeutic low-molecular-weight heparin 24 hours before a planned caesarean section and consider:

- aiming to perform the caesarean section as near to 24 hours after stopping low-molecular-weight heparin as possible and no later than 30 hours after stopping **or**
- switching to intravenous unfractionated heparin (aiming for an activated partial thromboplastin time [aPTT] of at least twice control), then 4 to 6 hours before caesarean section, stopping intravenous unfractionated heparin.

1.3.9 For women with mechanical heart valves who are having an induction of labour, a senior obstetrician should be involved in:

- deciding when to stop low-molecular-weight heparin or intravenous unfractionated heparin in order to:
  - minimise the risk of maternal haemorrhage or valve thrombosis
  - enable the option of regional analgesia
- reviewing the progress of labour **and**:
  - the need for low-molecular-weight heparin every 12 hours, aiming for birth as close to 12 hours from the last injection as possible **or**
  - the need for unfractionated heparin, aiming for birth as close to 4 to 6 hours after stopping the infusion.

1.3.10 For women with mechanical heart valves who are taking warfarin and who present in established labour:

- check the international normalised ratio (INR) immediately and consult a haematologist
- do not give anticoagulation until the woman has had an assessment by an obstetrician, which should happen within 2 hours
- carry out a senior review (including at least a senior obstetrician, haematologist and a consultant obstetric anaesthetist) to discuss the mode of birth most likely to give the lowest risk of bleeding for the woman and the baby
- consider reversal of anticoagulation.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.3.11 For women with mechanical heart valves, carry out a postpartum review, involving at least a senior obstetrician and anaesthetist, of the risk of haemorrhage and valve thrombosis within 3 to 4 hours of birth. Aim to restart therapeutic low-molecular-weight heparin or unfractionated heparin 4 to 6 hours after birth.

1.3.12 For women with mechanical heart valves at high risk of peripartum haemorrhage, consider the following options until hourly review indicates that therapeutic anticoagulation can be re-established:

- prophylactic low-molecular-weight heparin **or**
- no low-molecular-weight heparin.

1.3.13 For women with mechanical heart valves, consider delaying restarting warfarin until at least 7 days after birth and arrange specialist follow-up as outlined in the multidisciplinary care plan (see recommendation 1.3.6).

> To find out why the committee made the recommendations on management of anticoagulation for women with mechanical heart valves, and how they might affect practice, see rationale and impact.

Mode of birth for women with heart disease

1.3.14 Develop an individualised birth plan with the woman with heart disease covering all 3 stages of labour following multidisciplinary discussion (outlined in recommendation 1.2.1). Consider including a cardiologist with expertise in managing heart disease in pregnant women in the multidisciplinary team discussions.

1.3.15 Throughout pregnancy, manage pulmonary arterial hypertension in consultation with a specialist pulmonary hypertension centre.

1.3.16 Offer planned birth (induction of labour or caesarean section) for women with mechanical heart valves.

1.3.17 Consider planned caesarean section for women with:

- any disease of the aorta assessed as high risk

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- pulmonary arterial hypertension
- NYHA class III or IV heart disease.

Explain the benefits and risks of caesarean section. If the woman chooses not to have a caesarean section, explain the benefits and risks of an assisted second stage of labour compared with active pushing alone.

1.3.18 For women with heart disease who have a planned caesarean section, develop an individualised emergency care plan with the woman in case she presents in early labour, with new symptoms or with obstetric complications.

> To find out why the committee made the recommendations on mode of birth for women with heart disease and how they might affect practice, see rationale and impact.

Fluid management for women with heart disease

1.3.19 During pregnancy, plan the management of fluid balance during the intrapartum period for women with heart disease with the multidisciplinary team (outlined in recommendation 1.2.2). Include a cardiologist with expertise in managing heart disease in pregnant women. Multidisciplinary discussion should include:

- how the condition affects fluid balance
- optimum fluid balance and how this might be achieved
- plans for risk assessment and monitoring.

1.3.20 Identify women with heart disease for whom fluid balance is critical to cardiac function. These include women with:

- severe left-sided stenotic lesions (for example, aortic stenosis and mitral stenosis)
- hypertrophic cardiomyopathy
- cardiomyopathy with systolic ventricular dysfunction
- pulmonary arterial hypertension
- Fontan circulation and other univentricular circulations

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- NYHA class IV heart disease.

1.3.21 For women with heart disease in whom fluid balance is critical for optimal cardiac function, offer tailored monitoring and clinical review during the intrapartum period, and consider escalation as follows:

- hourly monitoring of fluid input and output (with at least 4-hourly assessment by a senior clinician), blood pressure, pulse, respiratory rate and oxygen saturation
- continuous electrocardiogram (ECG) and pulse oximetry with interpretation by trained staff
- continuous intra-arterial blood pressure monitoring
- cardiac output monitoring with non-invasive techniques, or serial echocardiography by trained staff.

  Advise women who need intensive monitoring that this may have to be carried out in an intensive care unit where the necessary equipment and expertise is available.

1.3.22 Offer standard fluid management during the intrapartum period for women with modified WHO 1 and NYHA class I heart disease.

1.3.23 Consider standard fluid management during the intrapartum period for women with modified WHO 2 to 3, or NYHA class II to III heart disease after a multidisciplinary discussion (outlined in recommendation 1.2.1).

> To find out why the committee made the recommendations on fluid management for women with heart disease and how they might affect practice, see rationale and impact.

Diagnosis and management of heart failure for all women in the intrapartum period

These recommendations cover the diagnosis and management of heart failure for all women in the intrapartum period. This includes women with existing heart disease, and women with no existing heart disease who develop symptoms and signs of heart failure.

1.3.24 Take a cardiac-specific history and suspect heart failure if there is not another likely cause of any of the following symptoms:

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- breathlessness when lying down (ruling out aortocaval compression) or at rest
- unexplained cough, particularly when lying down or which produces frothy pink sputum
- paroxysmal nocturnal dyspnoea – being woken from sleep by severe breathlessness and coughing, which may produce pink frothy sputum and is improved by moving to an upright position
- palpitation (awareness of persistent fast heart rate at rest).

1.3.25 Consider heart failure in the intrapartum period if there are any of the following signs:

- pale, sweaty, agitated with cool peripheries
- heart rate persistently greater than 110 beats per minute at rest
- respiratory rate persistently greater than 20 breaths per minute at rest
- hypotension (systolic blood pressure less than 100 mmHg)
- oxygen saturation less than 95% on air
- elevated jugular venous pressure
- added murmur or heart sound
- reduced air entry, basal crackles or wheeze, on listening to the chest.

1.3.26 If any of the symptoms or signs in recommendations 1.3.24 and 1.3.25 suggest heart failure, a senior clinician should review the woman's condition without delay.

1.3.27 When there is a clinical suspicion of heart failure in any woman in the intrapartum period:

- establish peripheral venous access
- measure urea and electrolytes, and perform a full blood count
- measure arterial blood gases

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- perform an ECG
- perform a chest X-ray.

1.3.28 If clinical suspicion of heart failure in the intrapartum period cannot be ruled out by the investigations in recommendation 1.3.27, arrange:

- review by a cardiologist (with interim review by a healthcare professional with expertise in this area if a cardiologist is not immediately available)
- a transthoracic echocardiogram by a trained technician or cardiologist
- measurement of N-terminal pro-brain natriuretic peptide (NT-proBNP) levels.

1.3.29 Consider early birth for women with heart failure due to cardiomyopathy, depending on the severity of the condition and how well the condition has responded to treatment.

1.3.30 Optimise treatment for heart failure as soon as possible after birth even if the woman is breastfeeding.

1.3.31 If clinical suspicion of heart failure persists after birth, consider the continued involvement of a cardiologist.

> To find out why the committee made the recommendations on diagnosis and management of heart failure in the intrapartum period and how they might affect practice, see rationale and impact.

Anaesthesia and analgesia for women with heart disease

1.3.32 During pregnancy, prepare a plan for managing anaesthesia and analgesia for women with heart disease involving a multidisciplinary team and the woman (outlined in recommendation 1.2.1). Consider including a haematologist for women on an anticoagulation regimen.

1.3.33 Consider offering the same information about anaesthesia and analgesia in labour to women with modified WHO 1 or modified WHO 2 heart disease as described in the NICE guideline on intrapartum care for healthy women and babies.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.3.34 Consider regional anaesthesia for women with modified WHO 3 and modified WHO 4 heart disease, unless this is contraindicated.

1.3.35 Consider collaborative working in the intrapartum period between an obstetric anaesthetist and a cardiac anaesthetist for women with modified WHO 3 and modified WHO 4 heart disease.

1.3.36 When using regional anaesthesia for women with heart disease, aim to preserve cardiovascular stability by, for example, using a sequential combined spinal–epidural technique.

1.3.37 Offer intrapartum monitoring of the heart and circulation to all women with modified WHO 3 and modified WHO 4 heart disease; this will usually include continuous invasive intra-arterial pressure monitoring and may include central venous pressure monitoring and advanced cardiac output monitoring.

1.3.38 Offer low-dose regional analgesia to women with modified WHO 3 or modified WHO 4 heart disease because this is less likely to cause cardiac instability during labour and birth.

1.3.39 Consider regional analgesia for women who have been on low-molecular-weight heparin and who have not had a prophylactic dose for at least 12 hours, or a therapeutic dose for at least 24 hours.

1.3.40 For women taking low-molecular-weight heparin:

- wait 12 hours after a prophylactic dose before siting an epidural, or removing an epidural catheter
- wait 24 hours after a therapeutic dose before siting an epidural or spinal, or removing an epidural catheter
- after siting an epidural or a spinal, or removing an epidural catheter, wait 4 hours before administering a further dose of low-molecular-weight heparin
- do not administer therapeutic dose low-molecular-weight heparin while an epidural catheter is in place.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

To find out why the committee made the recommendations on anaesthesia and analgesia for women with heart disease and how they might affect practice, see rationale and impact.

Management of the third stage of labour for women with heart disease

1.3.41 During pregnancy, prepare an individualised plan for managing the third stage of labour for women with heart disease, involving a multidisciplinary team and the woman (outlined in recommendation 1.2.1). Consider including a cardiologist with expertise in managing heart disease in pregnant women.

1.3.42 Treat women with modified WHO 1 heart disease as low risk and consider the full range of care options for healthy women in the third stage of labour described in the NICE guideline on intrapartum care for healthy women and babies.

1.3.43 Advise active management of the third stage of labour for women with modified WHO 2 heart disease, in line with the NICE guideline on intrapartum care for healthy women and babies.

1.3.44 Consider management of the third stage of labour for women with modified WHO 3 or modified WHO 4 heart disease[1] according to table 1.

Table 1 Management of the third stage of labour for women with modified WHO 3 or modified WHO 4 heart disease

Condition	First-line uterotonic	Second-line uterotonics	Drugs to avoid because of potential harm

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Significant aortopathy Marfan syndrome and Loeys–Dietz with aortic dilatation >40 mm. Bicuspid aortopathy and aortic dilatation >45 mm. Previous aortic dissection. Turner syndrome and aortic size index >25 cm/m^2.	Oxytocin.	Misoprostol. Carboprost.	Ergometrine (because of risk of hypertension-induced aortic dissection or rupture).
Limited or fixed low cardiac output, or preload-dependent circulation Severe systemic ventricular dysfunction (ejection fraction <30%). Severe valvular stenosis. Hypertrophic cardiomyopathy with diastolic dysfunction or significant outflow tract obstruction. Fontan circulation. Cyanotic heart disease.	Slow infusion of oxytocin to avoid sudden haemodynamic change.	Misoprostol. Carboprost.	Long-acting oxytocin analogues and ergometrine (because of risk of hypertension-induced heart failure).
Pulmonary arterial hypertension.	Oxytocin.	Misoprostol.	Ergometrine, carboprost and long-acting oxytocin analogues (because of risk of worsening pulmonary hypertension).
Coronary artery disease.	Oxytocin.	Misoprostol.	Ergometrine (because of risk of coronary ischaemia).

To find out why the committee made the recommendations on management of the third stage of labour for women with heart disease how they might affect practice, see rationale and impact.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.4 Asthma

Analgesia for women with asthma

1.4.1 Offer women with asthma the same options for pain relief during labour as women without asthma, including:

- Entonox (50% nitrous oxide plus 50% oxygen)
- intravenous and intramuscular opioids
- epidural
- combined spinal–epidural analgesia.

> To find out why the committee made the recommendation on pain relief during labour for women with asthma and how it might affect practice, see rationale and impact.

Prostaglandins for women with asthma

1.4.2 Do not offer prostaglandin F2 alpha (carboprost) to women with asthma because of the risk of bronchospasm.

1.4.3 Consider prostaglandin E1 or prostaglandin E2 as options for inducing labour in women with asthma because there is no evidence that they worsen asthma.

1.4.4 Consider prostaglandin E1 as an option for treating postpartum haemorrhage in women with asthma because there is no evidence it worsens asthma.

> To find out why the committee made the recommendations on prostaglandins for women with asthma and how they might affect practice, see rationale and impact.

1.5 Long-term systemic steroids

Steroid replacement regimens

1.5.1 Be aware that maternal corticosteroids given antenatally for fetal lung maturation should not affect the advice given in recommendations 1.5.2 to 1.5.4.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.5.2 For women planning a vaginal birth who have adrenal insufficiency or who are taking long-term oral steroids (equivalent to 5 mg or more prednisolone daily for more than 3 weeks):

- continue their regular oral steroids **and**
- when they are in established first stage of labour, add intravenous or intramuscular hydrocortisone and consider a minimum dose of 50 mg every 6 hours until 6 hours after the baby is born.

1.5.3 For women having a planned or emergency caesarean section who have adrenal insufficiency or who are taking long-term oral steroids (equivalent to 5 mg or more prednisolone daily for more than 3 weeks):

- continue their regular oral steroids **and**
- give intravenous hydrocortisone when starting anaesthesia; the dose will depend on whether the woman has received hydrocortisone in labour, for example:
  - consider giving 50 mg if she has had hydrocortisone in labour
  - consider giving 100 mg if she has not had hydrocortisone in labour
- give a further dose of hydrocortisone 6 hours after the baby is born (for example, 50 mg intravenously or intramuscularly).

1.5.4 Do not offer supplemental hydrocortisone in the intrapartum period to women taking inhaled or topical steroids.

> To find out why the committee made the recommendations on steroid replacement for women on long-term steroids and how they might affect practice, see rationale and impact.

1.6 Bleeding disorders

Regional anaesthesia and analgesia for women with bleeding disorders

1.6.1 Discuss the balance of benefits and risks of regional analgesia and anaesthesia with women with bleeding disorders.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.6.2 When considering regional analgesia and anaesthesia for women with bleeding disorders, take into account:

- the overall risk of bleeding and opportunity for corrective treatment
- therapeutic and prophylactic anticoagulation
- the risk of bleeding associated with the technique to be used
- the difficulty of needle siting or insertion
- the comparative risks associated with no analgesia or non-regional analgesia
- the comparative risks of general anaesthesia.

To find out why the committee made the recommendations on regional anaesthesia and analgesia for women with bleeding disorders and how they might affect practice, see rationale and impact.

Modifying the birth plan according to platelet count or function

1.6.3 For woman with known immune thrombocytopenic purpura, before admission for birth:

- plan birth in an obstetric-led unit with a neonatal unit that routinely provides high-dependency care
- plan as if the baby will be at risk of bleeding irrespective of the woman's platelet count
- consider monitoring maternal platelet count weekly from 36 weeks, and if the platelet count is below 50:
  - discuss and agree a plan for intrapartum care with the multidisciplinary team, including a haematologist
- consider giving steroids or intravenous immunoglobulin to raise the maternal platelet count.

1.6.4 For women with known immune thrombocytopenic purpura, on admission for birth:

- measure maternal platelet count

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- manage intrapartum care according to table 2.

1.6.5 For women with known or suspected immune thrombocytopenic purpura, take the following precautions to reduce the risk of bleeding for the baby:

- inform the neonatal team of the imminent birth of a baby at risk
- do not carry out fetal blood sampling
- use fetal scalp electrodes with caution
- do not use ventouse
- use mid-cavity or rotational forceps with caution
- bear in mind that a caesarean section may not protect the baby from bleeding
- measure the platelet count in the umbilical cord blood at birth.

1.6.6 Modify the birth plan based on maternal platelet count, using table 2 as a guide, for women with:

- gestational thrombocytopenia (without pre-eclampsia and HELLP syndrome, and otherwise well)
- an uncertain diagnosis of immune thrombocytopenic purpura.

Table 2 Modifying the birth plan according to maternal platelet count in women with immune thrombocytopenic purpura or gestational thrombocytopenia

Maternal platelet count	Maternal care	Fetal and neonatal care
Platelet count above 80×10^9/l	Treat the woman as healthy for the purpose of considering regional analgesia and anaesthesia.	If the woman has ITP or suspected ITP, assume the baby is at risk of bleeding and take precautions as outlined in recommendation 1.6.5. If the woman has gestational thrombocytopenia, assume the baby has a normal risk of bleeding.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Platelet count 50 to 80×10^9/l	Before considering regional analgesia and anaesthesia, take into account: • clinical history • the woman's preferences • anaesthetic expertise.	
Platelet count below 50×10^9/l	Avoid regional analgesia and anaesthesia under most circumstances.	
Abbreviation: ITP, immune thrombocytopenic purpura.		

To find out why the committee made the recommendations on modifying the birth plan according to platelet count or function and how they might affect practice, see rationale and impact.

Management of the third stage of labour for women with bleeding disorders

1.6.7 Be aware that women with bleeding disorders are at increased risk of primary and secondary postpartum haemorrhage.

1.6.8 Offer active management rather than physiological management of the third stage of labour for women with bleeding disorders, in line with the NICE guideline on intrapartum care for healthy women and babies.

1.6.9 For women with bleeding disorders, avoid giving uterotonics by intramuscular injection.

1.6.10 Offer individualised postpartum care, as discussed with a senior haematologist, for women with bleeding disorders, to include:

- measurement of blood loss
- monitoring obstetric complications
- monitoring haematological parameters.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.6.11 Be aware that non-steroidal anti-inflammatory drugs can add to the risk of bleeding.

1.6.12 Before discharge from hospital, inform women with bleeding disorders of the risk of secondary bleeding postpartum and how to access care.

> To find out why the committee made the recommendations on managing the third stage of labour for women with bleeding disorders and how they might affect practice, see rationale and impact.

1.7 Subarachnoid haemorrhage or arteriovenous malformation of the brain

Mode of birth and management of the second stage of labour for women with subarachnoid haemorrhage or arteriovenous malformation of the brain

1.7.1 Involve the multidisciplinary team in risk assessment for women with a cerebrovascular malformation or a history of intracranial bleeding. Include the woman in care planning and a clinician with expertise in managing neurovascular conditions in pregnant women.

Care for women with cerebrovascular malformation at low risk of intracranial bleeding

1.7.2 Classify the risk of intrapartum intracranial bleeding as low if a woman has:

- a fully treated cerebrovascular malformation **or**
- intracranial bleeding of unknown cause following investigation, which occurred more than 2 years ago.

1.7.3 For women with a cerebrovascular malformation at low risk of intracranial bleeding, base decisions on the mode of birth on the woman's preference and obstetric indications.

1.7.4 For women with a cerebrovascular malformation at low risk of intracranial bleeding, manage the second stage of labour based on the woman's preference and obstetric indications.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Care for women with cerebrovascular malformation at high risk of intracranial bleeding

1.7.5 Classify the risk of intrapartum intracranial bleeding as high if a woman has:

- an untreated or partially treated cerebrovascular malformation that has bled previously
- a large aneurysm (7 mm or more) or an aneurysm with other high-risk features as defined by a neuroradiologist
- a complex arteriovenous malformation
- cavernoma with high-risk features
- intracranial bleeding within the past 2 years.

1.7.6 Consider caesarean section for women who are at high risk of cerebral haemorrhage, after a full discussion with the woman of the benefits and risks of all the options.

1.7.7 For women at high risk of cerebral haemorrhage who prefer to aim for a vaginal birth or are in the second stage of labour:

- offer regional analgesia **and**
- explain the benefits and risks of an assisted second stage of labour compared with active pushing alone.

1.7.8 For women who present for the first time in labour with a history of cerebrovascular malformation or intracranial bleeding and unknown risk of intracranial bleeding, manage as high risk and follow recommendations 1.7.6 and 1.7.7.

1.7.9 Do not withhold regional analgesia or anaesthesia from women with an isolated cerebrovascular malformation unless they have a genetic predisposition to multiple vascular malformations or unknown genetic history.

To find out why the committee made the recommendations on care of women at risk of intracranial bleeding and how they might affect practice, see rationale and impact.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.8 Acute kidney injury or chronic kidney disease

Fluid management for women with kidney disease

1.8.1 During pregnancy, involve the multidisciplinary team in risk assessment for women with kidney disease. Include a clinician with expertise in managing renal conditions in pregnant women.

1.8.2 Ensure that women with chronic kidney disease stage 4 or 5 before pregnancy or women with progressive or active kidney disease are cared for in the intrapartum period by a midwife, obstetrician and obstetric anaesthetist with input from a clinician with expertise in managing renal conditions in pregnant women.

1.8.3 Ensure that a clinician with expertise in managing renal conditions in pregnant women is available for consultation during the intrapartum period for women with chronic kidney disease stage 4 or 5 before pregnancy or women with progressive or active kidney disease.

1.8.4 Manage acute kidney injury secondary to pre-eclampsia in line with the NICE guideline on hypertension in pregnancy.

1.8.5 For women with chronic kidney disease with or without pre-eclampsia, monitor fluid balance in the intrapartum period. Measure heart rate hourly and the following at least every 4 hours:

- blood pressure
- respiratory rate with chest auscultation
- fluid output and fluid intake
- oxygen saturation.

After each assessment, develop an individualised plan for managing fluid balance, which may involve additional monitoring techniques, with the aim of maintaining normal fluid volume to reduce the risks of acute kidney injury and pulmonary oedema.

1.8.6 Assess renal function at least every 24 hours during the intrapartum period in all women with chronic kidney disease because prolonged labour may lead to

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

dehydration and acute kidney injury.

1.8.7 For women with acute kidney injury:

- identify and correct the cause of the acute kidney injury
- measure heart rate hourly and monitor fluid balance in the intrapartum period by assessing the following at least every 4 hours:
  - blood pressure
  - respiratory rate and chest auscultation
  - fluid output and fluid intake
  - oxygen saturation
- develop an individualised plan for managing fluid balance, which may involve additional monitoring techniques, with the aim of maintaining normal fluid volume and avoiding both dehydration and pulmonary oedema
- consider giving a single small bolus of fluid (for example, 250 ml) as crystalloid if the woman is dehydrated and review the fluid status and urine output within an hour of giving the first fluid bolus and before considering giving a second
- continue to monitor fluid balance and renal function until the acute kidney injury has recovered.

1.8.8 Do not offer nephrotoxic drugs (for example, non-steroidal anti-inflammatory drugs) in the intrapartum period to women with kidney disease.

1.8.9 For all women with kidney disease during pregnancy:

- monitor the following at least every 4 hours for at least 24 hours after the birth:
  - heart rate and blood pressure
  - respiratory rate and chest auscultation
  - fluid output and fluid intake
  - oxygen saturation

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- ensure postpartum assessment of renal function and follow-up for women with persistent kidney disease.

To find out why the committee made the recommendations on fluid management for women with kidney disease and how they might affect practice, see rationale and impact.

Timing and mode of birth for women with kidney disease

1.8.10 As early as possible during pregnancy, plan intrapartum care for women with kidney disease due to lupus nephritis, vasculitis or glomerulonephritis with the woman and a clinician with expertise in managing renal conditions in pregnant women.

1.8.11 As early as possible during pregnancy, plan intrapartum care for women with a kidney transplant with the woman, a clinician with expertise in managing renal conditions in pregnant women and a kidney transplant surgeon.

1.8.12 For women with chronic kidney disease stage 1, stable renal function and non-nephrotic-range proteinuria (urine protein:creatinine ratio less than 300 mg/mmol), base decisions on timing and mode of birth on the woman's preference and obstetric indications.

1.8.13 Consider planned birth by 40^{+0} weeks of pregnancy for women with:

- chronic kidney disease stage 1 and nephrotic-range proteinuria (urine protein:creatinine ratio greater than 300 mg/mmol) **or**
- chronic kidney disease stage 2 to 4 with stable renal function.

1.8.14 For women with chronic kidney disease stage 5 or deteriorating stage 3b and stage 4, before 34^{+0} weeks of pregnancy, discuss the option of dialysis with the woman and the multidisciplinary team in an effort to prolong the pregnancy to at least 34^{+0} weeks.

1.8.15 For women with chronic kidney disease stage 5 or deteriorating stage 3b and stage 4, after 34^{+0} weeks of pregnancy, discuss the option of planned birth with the woman and the multidisciplinary team and consider birth no later than 38^{+0} weeks.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.8.16 For all women with kidney disease, including those with a kidney transplant, base decisions on mode of birth on the woman's preference and obstetric indications.

> To find out why the committee made the recommendations on timing and mode of birth for women with kidney disease and how they might affect practice, see rationale and impact.

1.9 Obesity

Assessing fetal presentation early in labour for women with a BMI over 30

1.9.1 Consider ultrasound scanning at the start of established labour if the baby's presentation is uncertain for women with a BMI over 30 kg/m^2 at the booking appointment, particularly those with a BMI over 35 kg/m^2.

> To find out why the committee made the recommendation on assessing fetal presentation early in labour for women with a BMI over 30 kg/m^2 and how it might affect practice, see rationale and impact.

Fetal monitoring for women with a BMI over 30

1.9.2 Base intrapartum fetal monitoring on the woman's preference and obstetric indications (including no antenatal care), in line with the NICE guideline on intrapartum care for healthy women and babies, for women with a BMI over 30 kg/m^2 at the booking appointment and no medical complications.

> To find out why the committee made the recommendation on fetal monitoring for women with a BMI over 30 kg/m^2 and how it might affect practice, see rationale and impact.

Position in labour for women with a BMI over 30

1.9.3 For women with a BMI over 30 kg/m^2 at the booking appointment, carry out a risk assessment in the third trimester. When developing the birth plan with the woman, take into account:

- the woman's preference

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- the woman's mobility
- comorbidities
- the woman's current or most recent weight.

1.9.4 For women with a BMI over 30 kg/m^2 at the booking appointment and reduced mobility in the third trimester, consider advising the lateral position in the second stage of labour.

1.9.5 For women with a BMI over 30 kg/m^2 at the booking appointment and adequate mobility, provide care in the second stage of labour in line with the NICE guideline on intrapartum care for healthy women and babies.

> To find out why the committee made the recommendations on position during the second stage of labour for women with a BMI over 30 kg/m^2 and how they might affect practice, see rationale and impact.

Equipment needs for women in labour with a BMI over 30

1.9.6 All obstetric units should have 'birthing beds' able to take a safe working load of 250 kg.

1.9.7 Carry out a risk assessment to ensure that essential equipment, in a size-appropriate form, is available for the intrapartum care of women with a BMI over 30 kg/m^2 at the booking appointment, including:

- surgical, obstetric and anaesthetic equipment
- blood pressure cuffs
- operating theatre tables
- lifting and lateral transfer equipment
- anti-embolism stockings
- wheelchairs
- monitoring and measuring equipment.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.9.8 For women with a BMI over 50 kg/m^2 at the booking appointment, offer referral to an obstetric unit with suitable equipment and expertise as early as possible in pregnancy, if this is not available in their current unit.

> To find out why the committee made the recommendations on equipment needs for women in labour with a BMI over 30 kg/m^2 and how they might affect practice, see rationale and impact.

1.10 Information for women with obstetric complications or no antenatal care

1.10.1 Follow the recommendations on communication in the NICE guideline on intrapartum care for healthy women and babies for women in labour with obstetric complications or no antenatal care.

1.10.2 Recognise that women in labour with obstetric complications or no antenatal care:

- may be more anxious than other women in labour **and**
- are likely to have a better experience of labour and birth if they receive information about the benefits and risks of options for their care and are fully involved in decision making.

1.10.3 Provide information about care in labour and mode of birth, which:

- is personalised to the woman's circumstances and needs
- uses local and national figures where possible
- expresses benefits and risks in a way that the woman can understand
- is presented as recommended in the NICE guideline on patient experience in adult NHS services.

1.10.4 Recognise that individual views about risk vary, and support a woman's decision making and choices.

1.10.5 Clarify with women with obstetric complications or no antenatal care whether and how they would like their birth companion(s) involved in discussions about care during labour and birth. Review this regularly.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.10.6 Involve the woman in planning her care by asking about her preferences and expectations for labour and birth. Take account of previous discussions, planning, decisions and choices, and keep the woman and her birth companion(s) fully informed.

> To find out why the committee made the recommendations on information for women with obstetric complications or no antenatal care and how they might affect practice, see rationale and impact.

1.11 Risk assessment for women with obstetric complications or no antenatal care

1.11.1 Take account of symptoms reported and concerns expressed by women in labour with any of the following:

- pyrexia
- sepsis
- intrapartum haemorrhage
- breech presentation
- suspected small-for-gestational-age baby
- suspected large-for-gestational-age baby
- previous caesarean section
- labour after 42 weeks of pregnancy
- no antenatal care.

1.11.2 Ensure that a healthcare professional with skills and experience in managing obstetric complications reviews and assesses the condition of a woman with any of the complications in recommendation 1.11.1, including any observations recorded, and escalates care as needed.

1.11.3 Take account of the whole clinical picture when discussing options for care with the woman during the intrapartum period.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.11.4 Carry out and record maternal observations (pulse, blood pressure, temperature and urine output), as recommended in the NICE guideline on intrapartum care for healthy women and babies and shown in table 3, for women in labour with any of the following and no other reasons for concern:

- breech presentation
- suspected small-for-gestational-age baby
- suspected large-for-gestational-age baby
- previous caesarean section
- labour after 42 weeks of pregnancy
- no antenatal care.

Table 3 Routine maternal observations for women in labour with breech presentation, suspected small- or large-for-gestational-age baby, previous caesarean section, onset of labour after 42 weeks or no antenatal care, and no other reasons for concern

Frequency of maternal observations[1]						
Pulse	Blood pressure	Respiratory rate	Temperature	Level of consciousness (AVPU)	Oxygen saturation	Urine
Hourly	4-hourly, and hourly in the second stage	Not required routinely	4-hourly	Not required routinely	Not required routinely	Record output

[1] The frequency of observations should be adjusted if necessary based on the level of clinical concern.

Abbreviation: AVPU, alert, voice, pain, unresponsive.

1.11.5 For women in labour with fever, a temperature of 38°C or above on a single reading or 37.5°C or above on 2 consecutive readings (1 hour apart), carry out maternal observations as shown in table 4.

1.11.6 For women in labour with sepsis or suspected sepsis, carry out maternal observations as shown in table 4.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.11.7 For women with intrapartum haemorrhage, continuously monitor vaginal blood loss and carry out maternal observations as shown in table 4.

Table 4 Routine maternal observations for women in labour with fever, suspected sepsis, sepsis or intrapartum haemorrhage

Complication	Frequency of maternal observations[1]						
	Pulse	Blood pressure	Respiratory rate	Temperature	Level of consciousness (AVPU)	Oxygen saturation	Uri
Fever	Hourly	4-hourly, and hourly in the second stage	4-hourly	Hourly	Hourly	4-hourly	Rec out
Suspected sepsis – concern insufficient for antibiotic treatment	Hourly	4-hourly, and hourly in the second stage	4-hourly	Hourly	Hourly	4-hourly	Rec out
Sepsis or suspected sepsis – on antibiotic treatment	Continuous, or at least every 30 minutes	Continuous, or at least every 30 minutes	Continuous, or at least every 30 minutes	Hourly	Every 30 minutes	Continuous, or at least every 30 minutes	Rec out hou cath
Intrapartum haemorrhage	At least hourly	At least 4-hourly, and at least hourly in the second stage	At least 4-hourly	At least 4-hourly	Hourly	At least 4-hourly	Rec out hou cath

[1] The frequency of observations should be adjusted if necessary based on the level of clinical concern.

Abbreviation: AVPU, alert, voice, pain, unresponsive.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

To find out why the committee made the recommendations on risk assessment for women with obstetric complications or no antenatal care and how they might affect practice, see rationale and impact.

1.12 Pyrexia

Use of antipyretics for women in labour with a fever

1.12.1 Consider paracetamol for women in labour with a fever, a temperature of 38°C or above on a single reading, or 37.5°C or above on 2 consecutive readings (1 hour apart).

1.12.2 Be aware that paracetamol is not a treatment for sepsis and should not delay investigation if sepsis is suspected.

To find out why the committee made the recommendations on use of antipyretics for women in labour with a fever and how they might affect practice, see rationale and impact.

Fetal blood sampling for women in labour with a fever

1.12.3 For women in labour with a fever, a temperature of 38°C or above on a single reading, or 37.5°C or above on 2 consecutive readings (1 hour apart), follow the recommendations 1.13.17 to 1.13.21 on fetal blood sampling for women with suspected sepsis.

To find out why the committee made the recommendation on fetal blood sampling for women in labour with a fever and how it might affect practice, see rationale and impact.

1.13 Sepsis

Mode of birth for women with sepsis or suspected sepsis

Recognising sepsis

1.13.1 Follow the NICE guideline on sepsis for the recognition of sepsis in pregnant women.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.13.2 Take into account the normal physiological changes in labour when thinking about the possibility of sepsis, for example, increased maternal pulse rate.

1.13.3 Recognise that women in labour with sepsis (see the NICE guideline on sepsis) are at higher risk of severe illness or death.

Multidisciplinary review for women in labour with suspected sepsis

1.13.4 For women in labour with suspected sepsis, ensure ongoing multidisciplinary review from a team with a named lead, including:

- a senior obstetrician
- a senior obstetric anaesthetist
- a senior midwife
- a labour ward coordinator.

Multidisciplinary review for women in labour with sepsis

1.13.5 For women in labour with sepsis, ensure ongoing multidisciplinary review from a team with a named lead, including:

- a senior obstetrician
- a senior obstetric anaesthetist
- a senior neonatologist
- a senior microbiologist
- a senior midwife
- a labour ward coordinator.

1.13.6 Include a senior intensivist (critical care specialist), if a woman in labour with sepsis has any of the following signs of organ dysfunction:

- altered consciousness
- hypotension (systolic blood pressure less than 90 mmHg)

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- reduced urine output (less than 0.5 ml/kg per hour)
- need for 40% oxygen to maintain oxygen saturation above 92%
- tympanic temperature of less than 36°C.

Planning intrapartum care for women with sepsis or suspected sepsis

1.13.7 For women with sepsis or suspected sepsis in the intrapartum period:

- agree a clear multidisciplinary care plan with the woman
- document the agreed plan
- review the plan regularly, taking account of the whole clinical picture, including response to treatment.

1.13.8 Involve the woman with sepsis or suspected sepsis and her birth companion(s) in shared decision making about her care, including the following options:

- induction of labour
- continuing labour
- augmenting labour
- instrumental birth
- caesarean section.

1.13.9 When discussing timing and mode of birth with a woman with sepsis or suspected sepsis, take into account the woman's preferences, concerns and expectations, and the whole clinical picture, including:

- the source and severity of sepsis, if known
- weeks of pregnancy
- fetal wellbeing
- stage and progress of labour
- parity

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- response to treatment.

1.13.10 If the source of sepsis is thought to be the genital tract, expedite the birth.

> To find out why the committee made the recommendations on mode of birth for women with sepsis or suspected sepsis and how they might affect practice, see rationale and impact.

Anaesthesia and analgesia for women in labour with sepsis or suspected sepsis

Anaesthesia for women in labour with sepsis and signs of organ dysfunction

1.13.11 For women in labour with sepsis and any signs of organ dysfunction (see recommendation 1.13.6), regional anaesthesia should only be used with caution and advice from a consultant obstetric anaesthetist, and with a senior anaesthetist present.

> To find out why the committee made the recommendation on anaesthesia for women in labour with sepsis and signs of organ dysfunction and how it might affect practice, see rationale and impact.

Analgesia for women in labour with sepsis or suspected sepsis

1.13.12 For women in labour with sepsis and any signs of organ dysfunction (see recommendation 1.13.6), regional analgesia should only be used with caution and advice from a consultant obstetric anaesthetist.

1.13.13 For women in labour with suspected sepsis where concern is insufficient for antibiotic treatment, consider the birthing pool as a form of analgesia only after discussion with a senior midwife and a senior obstetrician.

1.13.14 For women in labour who need antibiotics for suspected sepsis (see the NICE guideline on sepsis), start the antibiotics before inserting the needle for regional analgesia.

1.13.15 For women in labour with suspected sepsis, carry out a multidisciplinary review of options for pain relief at least every 4 hours.

1.13.16 If there are concerns about providing a woman's choice of regional analgesia,

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

this should be discussed with the consultant obstetric anaesthetist.

> To find out why the committee made the recommendations on analgesia for women in labour with sepsis or suspected sepsis and how they might affect practice, see rationale and impact.

Fetal monitoring for women in labour with sepsis or suspected sepsis

1.13.17 Advise continuous cardiotocography during labour for:

- women with suspected sepsis **and**
- women with confirmed sepsis

in line with recommendation 1.10.4 in the NICE guideline on intrapartum care for healthy women and babies.

1.13.18 Explain to the woman and her birth companion(s) what fetal blood sampling involves and the uncertainty of the significance of the results, and support her decision to accept or decline testing.

1.13.19 Be aware that for women in labour with sepsis or suspected sepsis, fetal blood sample results may be falsely reassuring, and always discuss with a consultant obstetrician:

- whether fetal blood sampling is needed
- the results of any fetal blood sampling carried out.

[This recommendation is adapted from the NICE guideline on intrapartum care for healthy women and babies.]

1.13.20 For women in labour with sepsis or suspected sepsis and an abnormal cardiotocograph trace, think about the whole clinical picture and take account of the following before performing any fetal blood sampling and when interpreting the results:

- the woman's preferences
- stage and progress of labour

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- parity
- likelihood of chorioamnionitis.

1.13.21 If sepsis continues to be suspected, only repeat fetal blood sampling with caution and in discussion with a consultant obstetrician.

> To find out why the committee made the recommendations on fetal monitoring for women in labour with sepsis or suspected sepsis and how they might affect practice, see rationale and impact.

Antimicrobial treatment for women in labour with sepsis or suspected sepsis

1.13.22 For women in labour with sepsis or suspected sepsis:

- Take into account the whole clinical picture when thinking about antimicrobial treatment.
- Document the rationale for any decision to start antimicrobial treatment and the choice of antimicrobial.
- Take specimens for microbiological culture, including blood cultures, before starting antimicrobials in line with the NICE guideline on sepsis.

1.13.23 For women in labour with sepsis or suspected sepsis and a clear source of infection, use existing local antimicrobial guidance when offering an antimicrobial. [This recommendation is adapted from the NICE guideline on sepsis.]

1.13.24 For women in labour with sepsis or suspected sepsis and an unclear source of infection, offer a broad-spectrum intravenous antimicrobial from the agreed local formulary and in line with local (where available) or national guidelines. [This recommendation is adapted from the NICE guideline on sepsis.]

1.13.25 Explain to the woman in labour with sepsis or suspected sepsis and her birth companion(s):

- there is no evidence to support the use of one broad-spectrum antimicrobial over another

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- the choice of antimicrobial will be guided by local antimicrobial guidelines.

To find out why the committee made the recommendations on antimicrobial treatment for women in labour with sepsis or suspected sepsis and how they might affect practice, see rationale and impact.

Care for women with sepsis or suspected sepsis immediately after the birth

1.13.26 For women with sepsis or suspected sepsis, ensure that there is ongoing multidisciplinary review (see recommendations 1.13.4 to 1.13.6) in the first 24 hours after the birth. This should include a discussion about the need for:

- microbiological specimens for culture
- antimicrobial treatment
- increased frequency of monitoring
- an enhanced level of care and monitoring
- further investigations such as imaging
- support to enable the woman to feed her baby as she chooses (including keeping the woman and baby together wherever possible and maintaining skin-to-skin contact)
- additional support for the woman and her family.

To find out why the committee made the recommendation on care for women with sepsis or suspected sepsis immediately after the birth and how it might affect practice, see rationale and impact.

1.14 Intrapartum haemorrhage

Management of intrapartum haemorrhage

1.14.1 If there are signs of shock in a woman with intrapartum haemorrhage, proceed with immediate resuscitation.

1.14.2 The maternity service and ambulance service should have strategies in place to respond quickly and appropriately if a woman has an intrapartum haemorrhage in any setting. [This recommendation is adapted from the NICE guideline on

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

intrapartum care for healthy women and babies.]

1.14.3 If a woman in labour has any vaginal blood loss other than a 'show', transfer her to obstetric-led care, in line with the NICE guideline on intrapartum care for healthy women and babies.

1.14.4 If a woman in labour has any vaginal blood loss other than a 'show', explain to her and her birth companion(s) what is happening.

1.14.5 If a woman in labour has any vaginal blood loss other than a 'show':

- Take a history of the bleeding, asking about:
  - any associated symptoms, including pain
  - any specific concerns the woman may have
  - any previous uterine surgery.
- Check previous scans for placental position.
- Assess the volume of blood loss and characteristics of the blood, such as colour, and presence of clots or amniotic fluid.
- Carry out a physical examination, including:
  - vital signs
  - abdominal palpation
  - speculum examination
  - vaginal examination if placenta praevia has been excluded
  - fetal heart auscultation.
- Start continuous cardiotocography.
- Take a blood sample to determine full blood count and blood group.

1.14.6 Think about the possible causes of bleeding, for example:

- placental abruption

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- placenta praevia
- uterine rupture
- vasa praevia.

Recognise that in many cases, no cause will be identifiable.

1.14.7 If a woman in labour has any vaginal blood loss other than a 'show', agree a multidisciplinary care plan with the woman and document the plan. Include the following in plans for multidisciplinary care:

- a senior obstetrician
- a senior obstetric anaesthetist
- a senior midwife
- a labour ward coordinator.

1.14.8 If a woman has intrapartum bleeding and her condition is stable, management should include:

- establishing venous access
- maternal monitoring (see recommendation 1.11.7 and table 4)
- monitoring the fetal heart rate with continuous cardiotocography.

1.14.9 If a woman with intrapartum bleeding has a large blood loss or her condition causes concern, management should be in line with recommendation 1.14.8 and also include:

- giving intravenous fluids urgently
- taking blood for full blood count and cross-matching
- seeking medical advice from a more experienced healthcare professional.

Management may also include:

  - triggering the local major haemorrhage protocol

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- – taking blood for clotting studies and blood gases
- – use of amniotomy or oxytocin
- – expediting the birth.

1.14.10 If a woman in labour has vaginal blood loss typical of a 'show', follow the NICE guideline on intrapartum care for healthy women and babies.

> To find out why the committee made the recommendations on management of intrapartum haemorrhage and how they might affect practice, see rationale and impact.

1.15 Breech presenting in labour

Mode of birth for women presenting with a breech position in labour

1.15.1 Discuss with women in labour with breech presentation the possible benefits and risks of vaginal birth and caesarean section, including:

- an increase in the chance of serious medical problems for the woman with caesarean section
- an increase in the chance of serious medical problems for the baby with vaginal birth
- what it might mean for them and the baby if such problems did occur.

1.15.2 Explain to women in labour with breech presentation that any benefit of caesarean section in reducing the chance of serious medical problems for the baby may be greater in early labour.

1.15.3 Offer women in labour with breech presentation a choice between continuing labour and caesarean section.

1.15.4 Assess progress of labour in line with the NICE guideline on intrapartum care for healthy women and babies.

> To find out why the committee made the recommendations on mode of birth for women presenting with a breech position in labour and how they might affect practice, see rationale and impact.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.16 Small-for-gestational-age baby

Fetal monitoring in labour for babies suspected to be small for gestational age

1.16.1 Discuss with a woman whose baby is suspected to be small for gestational age:

- the chance of serious medical problems for her baby
- what it might mean for her and her baby if such problems did occur.

1.16.2 When discussing risk, explain that when a baby is suspected to be small for gestational age:

- it is sometimes difficult to be certain the suspicion is correct until the baby is born
- the chance of serious medical problems for the baby is greater with:
  - growth restriction
  - additional risk factors, such as preterm birth
  - complications during labour or birth.

1.16.3 Offer continuous cardiotocography to women whose babies are suspected to be small for gestational age after a full discussion of the benefits and risks (see recommendations 1.16.1 and 1.16.2). Respect the woman's decision if she declines continuous cardiotocography.

> To find out why the committee made the recommendations on fetal monitoring in labour for babies suspected to be small for gestational age and how they might affect practice, see rationale and impact.

1.17 Large-for-gestational-age baby

Mode of birth for babies suspected to be large for gestational age

1.17.1 Explain to women in labour whose babies are suspected to be large for gestational age that:

- it is sometimes difficult to be certain the suspicion is correct until the baby is born

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- when making decisions about mode of birth (for example, vaginal birth or caesarean section), this uncertainty needs to be taken into account.

1.17.2 Discuss with women in labour whose babies are suspected to be large for gestational age the possible benefits and risks of vaginal birth and caesarean section, including:

- a higher chance of maternal medical problems such as infection with emergency caesarean section
- a higher chance of shoulder dystocia and brachial plexus injury with vaginal birth
- a higher chance of instrumental birth and perineal trauma with vaginal birth.

Explain to the woman and her birth companion(s) what it might mean for her and her baby if such problems did occur.

1.17.3 Offer women in labour whose babies are suspected to be large for gestational age a choice between continuing labour, including augmented labour, and caesarean section.

> To find out why the committee made the recommendations on mode of birth for babies suspected to be large for gestational age and how they might affect practice, see rationale and impact.

1.18 No antenatal care

Risk assessment and management of labour for women with no antenatal care

1.18.1 For women who have had no antenatal care, be aware of the particular importance of following the recommendations on establishing rapport and treating with respect in the NICE guideline on intrapartum care for healthy women and babies.

1.18.2 Provide obstetric-led intrapartum care for women who have had no antenatal care, and alert the neonatal team and, if relevant, the anaesthetic team. If the woman presents to a midwifery unit, arrange urgent transfer to an obstetric-led unit if appropriate.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.18.3 For a woman with no antenatal care who has difficulty understanding, speaking and reading English, provide an interpreter (who may be a link worker or advocate and should not be a member of her family, her legal guardian or her partner), who can communicate with her in her preferred language. [This recommendation is adapted from the NICE guideline on pregnancy and complex social factors.]

1.18.4 If possible, take a full medical, psychological and social history from women who have had no antenatal care.

- Try to find out why there has been no care during pregnancy.
- Ask the woman who, if anyone, she would like to support her as her birth companion(s) during labour.
- Explore sensitively any possible vulnerability or safeguarding concerns, including:
  - young maternal age
  - maternal mental health
  - maternal learning disability
  - maternal substance misuse
  - domestic or sexual abuse
  - homelessness
  - human trafficking
  - undocumented migrant status
  - female genital mutilation
  - the woman or family members being known to children's services or social services.

1.18.5 Carry out an obstetric and general medical examination of a woman with no antenatal care as soon as possible. This should include the initial assessment described in the NICE guideline on intrapartum care for healthy women and babies.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.18.6 Carry out an assessment of the unborn baby, including ultrasound if possible, to determine:

- viability
- the presentation
- an estimate of gestational age
- the possibility of multiple pregnancy
- the placental site.

1.18.7 Offer women who have had no antenatal care, tests for:

- anaemia (full blood count)
- haemoglobinopathies
- blood group and rhesus D status
- atypical red cell alloantibodies
- random blood glucose
- asymptomatic bacteriuria
- HIV, hepatitis B and syphilis.

1.18.8 Offer rapid HIV testing to women thought to be at high risk of infection, which might include:

- recent migrants from countries with high rates of HIV infection
- women who misuse substances intravenously
- suspected sexual abuse.

1.18.9 Explain to a woman who has had no antenatal care why and when information about her pregnancy may need to be shared with other agencies. [This recommendation is adapted from the NICE guideline on pregnancy and complex social factors.]

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

1.18.10 Contact the woman's GP and, if appropriate, other health or social care professionals for more information about the woman's history and to plan ongoing care.

1.18.11 If there are safeguarding concerns, refer the woman to safeguarding services, document the referral and inform healthcare professionals such as the GP, health visitor and paediatric teams, and social care professionals (see the NICE guidelines on pregnancy and complex social factors, child maltreatment and child abuse and neglect).

1.18.12 Follow the recommendations in the NICE guideline on intrapartum care for healthy women and babies when no medical conditions or obstetric complications are identified in women who present in labour with no antenatal care.

> To find out why the committee made the recommendations on risk assessment and management of labour for women with no antenatal care and how they might affect practice, see rationale and impact.

1.19 Previous caesarean section

Management of the first and second stages of labour for women with a previous caesarean section

1.19.1 Do not routinely insert an intravenous cannula for women in labour who have had a previous caesarean section.

1.19.2 Explain to women in labour who have had a previous caesarean section that:

- a vaginal birth is associated with a small chance of uterine rupture
- an emergency caesarean section may mean a higher chance of:
  - heavy bleeding needing a blood transfusion
  - infection, for example, intrauterine infection
  - a longer hospital stay
  - complications in a future pregnancy, for example, placenta praevia and placenta

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

- – accreta (see the NICE guideline on caesarean section).

1.19.3 Explain to women in labour who have had a previous caesarean section that there is little evidence of a difference in outcomes for the baby between a vaginal birth or another caesarean section.

1.19.4 Explain to women who have had a previous caesarean section that they are likely to have a lower chance of complications in labour if they have also had a previous vaginal birth.

1.19.5 When discussing oxytocin for delay in the first or second stage of labour, explain to women who have had a previous caesarean section that this:

- increases the chance of uterine rupture
- reduces the chance of another caesarean section
- increases the chance of an instrumental birth.

1.19.6 Offer continuous cardiotocography to women with a previous caesarean section if using oxytocin for delay in the first or second stage of labour.

1.19.7 Support informed choice of a full range of options for pain relief for women who have had a previous caesarean section, including labour and birth in water.

1.19.8 Explain to women in labour who have had a previous caesarean section that regional analgesia is associated with:

- a reduced chance of another caesarean section
- an increased chance of an instrumental birth.

1.19.9 Do not routinely offer amniotomy to women in labour who have had a previous caesarean section.

1.19.10 Offer continuous cardiotocography to women with a previous caesarean section if performing amniotomy.

1.19.11 For women who have had a previous caesarean section, be aware of the particular importance of following the recommendations from the NICE

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

guideline on intrapartum care for healthy women and babies on:

- food and drink in labour
- controlling gastric acidity
- position in labour, including the latent first stage, and birth.

To find out why the committee made the recommendations on management of the first and second stages of labour for women with a previous caesarean section and how they might affect practice, see rationale and impact.

1.20 Labour after 42 weeks of pregnancy

Fetal and maternal monitoring for women in labour after 42 weeks of pregnancy

1.20.1 Offer continuous cardiotocography to women in labour after 42 weeks of pregnancy after a full discussion of the benefits and risks to the woman and her baby. Respect the woman's decision if she declines continuous cardiotocography.

To find out why the committee made the recommendation on fetal and maternal monitoring for women in labour after 42 weeks of pregnancy and how it might affect practice, see rationale and impact.

Terms used in this guideline

Chronic kidney disease stages

Classified according to estimated glomerular filtration rate (eGFR) measured before pregnancy. See glomerular filtration rate (GFR) categories in table 1 in the NICE guideline on chronic kidney disease in adults.

Intrapartum period

The intrapartum period is from the onset of labour (spontaneous or induced) to 24 hours after birth.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Mechanical heart valves

A mechanical heart valve refers to a prosthetic heart valve that requires long-term anticoagulation to prevent heart valve thrombosis. This is different from a bioprosthetic heart valve, which does not need long-term anticoagulation.

Regional anaesthesia

Regional anaesthesia includes spinal, epidural and combined spinal–epidural techniques.

Regional analgesia

Regional analgesia includes spinal, epidural and combined spinal–epidural techniques.

[1] Defined according to the modified World Health Organization classification of maternal cardiovascular risk (European Society of Cardiology 2018).

[2] See American Heart Association's information about classes of heart failure.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Recommendations for research

The guideline committee has made the following high-priority recommendations for research. For details of all the committee's recommendations for research, see the evidence reviews.

1 Subarachnoid haemorrhage or arteriovenous malformation of the brain

Does caesarean section protect against cerebral haemorrhage in women with a history of subarachnoid haemorrhage or cerebrovascular malformation?

> To find out why the committee made the research recommendation on caesarean section for women with subarachnoid haemorrhage or arteriovenous malformation of the brain, see rationale.

2 Needle siting in pregnant women who are obese

Does the use of ultrasound of the lumbar spine improve siting of regional anaesthetic needles in pregnant women with a BMI over 30 kg/m^2 at the booking appointment?

> To find out why the committee made the research recommendation on needle siting in pregnant women who are obese, see rationale.

3 Obesity as a risk factor for perinatal morbidity and mortality

Is obesity an independent risk factor for perinatal morbidity and mortality?

> To find out why the committee made the research recommendation on obesity as a possible independent risk factor for perinatal morbidity and mortality, see rationale.

4 Risk assessment for women in labour with signs of sepsis

What clinical features and laboratory investigations can be used to better stratify risk for women in labour with signs of sepsis (including fever and tachycardia)?

> To find out why the committee made the research recommendation on risk assessment for women in labour with signs of sepsis, see rationale.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

5 Previous caesarean section

What is the clinical and cost effectiveness of intermittent auscultation compared with continuous cardiotocography for women in labour who have had a previous caesarean section?

To find out why the committee made the research recommendation on monitoring in labour for women with a previous caesarean section, see rationale.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Rationale and impact

These sections briefly explain why the committee made the recommendations and how they might affect practice. They link to details of the evidence and a full description of the committee's discussion.

Information for women with existing medical conditions

Recommendations 1.1.1 to 1.1.5

Why the committee made the recommendations

Evidence was very limited, but the committee knew from their experience that providing information is extremely important for pregnant women with medical conditions. They agreed that women would need the general information outlined in the NICE guideline on intrapartum care for healthy women and babies as well as additional information related to the medical condition. Extra time may be needed in a consultation to discuss how the medical condition may affect intrapartum care. It was agreed that information should be delivered by a healthcare professional from the multidisciplinary team who can answer questions the woman may have about the intrapartum period and the medical condition. It is up to the woman to decide whether and how her birth companion(s) are involved in these discussions.

How the recommendations might affect practice

The committee did not expect a significant change in practice because the recommendations are in line with what is generally happening in most centres. However, in centres where this is not happening, consultations will take longer.

Full details of the evidence and the committee's discussion are in evidence review A: information for women with existing medical conditions.

Return to recommendations

Planning for intrapartum care with women with existing medical conditions – involving a multidisciplinary team

Recommendations 1.2.1 and 1.2.2

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Why the committee made the recommendations

Evidence did not show a difference in outcomes for women with a BMI over 40 or their babies when care was given by a specialist antenatal multidisciplinary team. However, the committee recognised that women with medical conditions have an increased risk of adverse outcomes, and a lack of multidisciplinary working has been repeatedly cited in the Confidential Enquiries into Maternal Deaths and Morbidity as contributing to maternal deaths. To minimise risk, the committee recommended that a standard obstetric team be extended (when appropriate) by involving healthcare professionals with expertise in managing the woman's medical condition, and that teams involved in the woman's care share their intrapartum care plans.

How the recommendations might affect practice

Multidisciplinary teams are not currently in place in all settings, including settings where care is delivered to women at high risk because of medical conditions. However, multidisciplinary working with other medical or surgical specialties is currently expected within the intermediate and intensive pathways for more complex pregnancies. The recommendations are expected to result in a relatively modest change in practice because most modern multidisciplinary teams are 'virtual' (communicating by telephone or email rather than in person). Obstetric teams and specialists will be seeing the same women that they would see anyway, but multidisciplinary working will give them the opportunity to deliver more holistic care. However, establishing the relationships and ways of working may involve extra organisation and increase the antenatal involvement of obstetric anaesthetists.

Full details of the evidence and the committee's discussion are in evidence review B: antenatal care planning involving a multidisciplinary team for women with existing medical conditions.

Return to recommendations

Risk assessment for women with heart disease

Recommendations 1.3.1 to 1.3.5

Why the committee made the recommendations

The committee drew on their knowledge and experience to recommend that intrapartum care planning should start early in pregnancy for women with heart disease. Pregnancy and birth are associated with dramatic changes in the performance of the heart and the circulation. Early risk assessment is needed to plan for birth and agree any additional management. Women who present

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

in the intrapartum period with a previously unrecognised heart problem pose a particular challenge. Urgent multidisciplinary discussions are needed to ensure that they are offered comparable intrapartum care to women with an existing diagnosis.

The committee agreed that multidisciplinary care should include a cardiologist with expertise in managing heart conditions during pregnancy because they were concerned that not all pregnant women with heart disease have appropriate cardiac referrals. Only a few cardiologists in the UK have an interest in managing heart disease in pregnancy and the Confidential Enquiries into Maternal Deaths and Morbidity identified deficient care when non-specialist cardiologists had given inappropriate advice. The benefit of specialist cardiology advice also includes encouraging women with low-risk conditions towards vaginal birth with no medical intervention, in line with the NICE guideline on intrapartum care for healthy women and babies.

Based on the available evidence and their knowledge and experience, the committee agreed that risk assessment should include diagnostic classification, cardiac functional capacity and clinical assessment. For some women, this can mean reassurance that no additional precautions are needed; for others, a full discussion of the risks and a comprehensive plan will be required. The committee recognised the importance of thorough clinical assessment as raised in the confidential enquiries and the need to provide prompt investigation identified in the 2016 MBBRACE-UK report.

Based on their knowledge and experience, the committee recommended that the woman's clinical condition is reassessed regularly during pregnancy and the intrapartum period. Many changes in performance of the heart and circulation occur gradually during pregnancy, but the intrapartum period and early postpartum period (including the first hours and days after birth) sees changes that can trigger a deterioration in cardiac function and therefore it is vital that investigations are undertaken and acted on promptly.

How the recommendations might affect practice

The committee agreed that the recommendations will reduce variation in practice and encourage best practice that already exists in many areas of the country. In some areas, there may be more referrals to tertiary level services for specialist advice from a cardiologist with expertise in managing heart conditions during pregnancy. However, specialist advice should better determine which women need additional intervention and provide reassurance for those women whose heart condition would not affect their birth plans.

The committee believed that cardiac investigations are not rapidly available in all areas of the UK

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

and this is reinforced by delays to investigations being identified by the Confidential Enquiries into Maternal Deaths and Morbidity in some cases of maternal death. There is variation in access to echocardiography, an investigation that can be crucial to making a diagnosis when symptoms of heart disease develop in the intrapartum period. A plan to ensure urgent access to echocardiography (including out of hours) for pregnant women with heart disease should be considered.

The recommendation that vaginal birth is safe for women with mild heart disease may reduce unnecessary medical intervention.

Full details of the evidence and the committee's discussion are in evidence review C: heart disease.

Management of anticoagulation for women with mechanical heart valves

Recommendations 1.3.6 to 1.3.13

Why the committee made the recommendations

The evidence looked at the effects of different anticoagulants throughout pregnancy on maternal and neonatal outcomes rather than their effects during labour. The evidence was also limited to women with mechanical heart valves. Therefore, the committee based recommendations on their experience and advice from a cardiac specialist.

They noted that a woman with a mechanical heart valve is prone to thrombosis if she has inadequate anticoagulation, but is vulnerable to excessive bleeding with too much anticoagulation. Either can lead to devastating fatal incidents for the woman and her baby. It is therefore important that planning for the management of anticoagulation during the intrapartum period starts when pregnancy is confirmed. The committee agreed that a woman with a mechanical heart valve should be switched to low-molecular-weight heparin by 36 weeks of pregnancy, or 2 weeks before planned birth, because heparin has a shorter half-life than warfarin and it does not cross the placenta so reducing the risk of bleeding in the baby.

The committee acknowledged that intravenous unfractionated heparin continues to be used in some centres, although recognised that use of unfractionated heparin has declined in the UK. Recommendations on newer anticoagulants were not made because their use is limited in practice. The committee agreed, based on the once-daily dosing of warfarin, that low-molecular-weight heparin should be started 24 hours after stopping warfarin. Monitoring of anti-Xa level and dose adjustments are needed to ensure that an appropriate level of anticoagulation is achieved. The

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

committee agreed trough levels might be useful and should be checked.

For women who have a planned caesarean section, the risk of an epidural haematoma can be reduced by stopping low-molecular-weight heparin 24 hours before. For women having an induction of labour, the decision of when to stop low-molecular-weight heparin should balance the risk of valve thrombosis against the possibility of having regional analgesia. A senior obstetrician should be involved in this decision and review the progress of induction.

For a woman presenting in labour on warfarin, the committee agreed that anticoagulation be stopped immediately to minimise the risks of excessive bleeding for the woman and baby during labour. The committee recommended that obstetric assessment should occur within 2 hours, recognising that although assessment was urgent, it would not always be possible to do this immediately. The committee agreed that the international normalised ratio (INR) be checked immediately and a haematologist consulted. The INR determines the degree of anticoagulation in the woman and baby and indicates how anticoagulation should be managed. A haematologist would advise how to reverse anticoagulation if this was needed. Senior review, involving a senior obstetrician, haematologist and consultant obstetric anaesthetist, should ensure the safest birth for the woman and baby.

The committee acknowledged that reintroducing therapeutic anticoagulation 4 to 6 hours after birth (rather than 48 hours) increases the risk of uterine haemorrhage. They considered data from the European Registry of Pregnancy and Cardiac Disease (ROPAC) on anticoagulation in pregnancy for women with mechanical heart valves. Although not addressing peripartum anticoagulation, the study confirmed the high risk of haemorrhage with anticoagulation but also indicated a higher risk of mechanical heart valve thrombosis in pregnancy. With limited evidence, the committee, supported by specialist cardiac and haematology input, agreed to follow the European Society of Cardiology (ESC) guidelines and recommend that therapeutic anticoagulation is reintroduced 4 to 6 hours after birth. They considered the risk of peripartum mechanical heart valve thrombosis to be higher in pregnancy and to be of greater consequence than the increased risk of uterine haemorrhage with earlier reintroduction of anticoagulation.

How the recommendations might affect practice

The committee believed that these recommendations reflect modern UK practice and the growing clinical use of low-molecular-weight heparin, and acknowledge some continued use of unfractionated heparin. Anti-Xa assays are essential for the monitoring and titration of low-molecular-weight heparin and the committee recognised that access to this test may need to be improved.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Full details of the evidence and the committee's discussion are in evidence review C: heart disease.

Mode of birth for women with heart disease

Recommendations 1.3.14 to 1.3.18

Why the committee made the recommendations

Evidence was very limited so the committee drew on their knowledge and experience to make recommendations. They agreed that risk assessment is necessary to understand how well the woman's heart is functioning and is likely to cope with the exertion of labour and the circulatory changes that take place after birth. Women should be involved in formulating an individualised birth plan, with advice from a team with experience of intrapartum care for women with heart conditions. This will usually involve doctors from at least 3 specialties (obstetrics, cardiology and anaesthesia). In this way, the woman's wishes for labour and birth can be discussed in relation to the specific risks of her condition.

In the UK, the management of pulmonary arterial hypertension is concentrated in a small number of specialist pulmonary hypertension centres. Pulmonary arterial hypertension is a life-threatening condition that requires expert management. The multidisciplinary team planning for a woman with pulmonary hypertension must include a respiratory clinician from 1 of these centres.

In order to minimise the time without anticoagulation, planned caesarean section or induction of labour should be offered to women with mechanical heart valves. The risks of valve thrombosis cannot be overstated but this needs to be balanced against the risks of bleeding around the time of birth.

Planned caesarean section should be considered for women with high-risk aortic disease or the most severe cardiac conditions, but the committee recognised that some of these women may prefer to plan for a vaginal birth. When this is the woman's preference, she should be fully informed of the benefits and risks of assisted second stage of labour compared with active pushing alone, in order to reduce the risk of aortic dissection, aortic rupture or acute heart failure.

Although the exertion of labour and the fluid shifts at birth may be detrimental to some heart conditions, this is not true for all women. The committee considered that many women with mild heart disease can be reassured that a normal vaginal birth is safe.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

How the recommendations might affect practice

It is thought that the recommendations largely reflect current UK practice. The committee recognised that most women with more severe heart disease are already managed in large obstetric-led units by clinical teams with experience in this area. By attempting to define the conditions that pose the highest risk, the recommendations may result in further centralisation of specialist services.

Women with pulmonary hypertension are already offered care in specialist centres. Pregnancy and childbirth hold such serious risks for women with this condition and the committee agreed that liaison with specialist respiratory clinicians was essential.

Full details of the evidence and the committee's discussion are in evidence review C: heart disease.

Fluid management for women with heart disease

Recommendations 1.3.19 to 1.3.23

Why the committee made the recommendations

In the absence of evidence, the committee used their knowledge and experience to make recommendations for haemodynamic monitoring during birth for women with heart disease. Risk assessment and planning of intrapartum monitoring needs specialist multidisciplinary input. Discussions should take place during pregnancy and involve the woman so that she knows how her condition might be affected by changes in blood pressure, blood volume and fluid shifts during labour and birth, and the type of monitoring needed to manage this.

For women with mild heart disease, management of fluid balance does not mean a change from standard care. For those with more severe conditions, standard care may still be suitable but decisions need to be based on specialist assessment of the type and severity of the condition and the woman's views. There are some heart conditions in which fluid balance is critical to cardiac function, and frequent monitoring and assessment by a clinician with expertise in management of heart disease in pregnancy, such as a consultant anaesthetist, obstetrician, cardiologist or intensivist, are needed as a minimum. For these conditions, more invasive monitoring may also be needed. As part of the clinical review, this should be discussed with the woman, and those who need intensive monitoring should be made aware that they are likely to need to go to an intensive care unit or delivery suite where this expertise exists.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

How the recommendations might affect practice

The committee agreed that specialist planning for intrapartum monitoring to identify the monitoring needs of women with different heart conditions together with stepped escalation of monitoring intensity, would reduce variation in practice. It would allow NHS resources to be directed more effectively to reduce morbidity and mortality associated with fluid management during the intrapartum period for women with cardiac conditions and their babies. Women's experience of labour and birth would be improved through their involvement in management discussions and because they would receive a level of intervention appropriate to their needs, taking their priorities for birth into account where possible.

Full details of the evidence and the committee's discussion are in evidence review C: heart disease.

Diagnosis and management of heart failure for all women in the intrapartum period

Recommendations 1.3.24 to 1.3.31

Why the committee made the recommendations

Although most of the recommendations were based on the committee's experience because of the limited evidence, there was some evidence to inform the recommendations on heart rate and using N-terminal pro-brain natriuretic peptide (NT-proBNP) levels. The committee agreed that symptoms and signs suggesting heart failure should be assessed initially by a member of the obstetric team and if present, confirmed by a senior clinician. When clinical examination raises the suspicion of heart failure, imaging and blood tests are needed to assist review by a cardiologist or the most senior available clinician to make a definitive diagnosis. This recommendation arises from evidence from the Confidential Enquiries into Maternal Deaths and Morbidity, that the diagnosis may be missed or delayed.

The committee made recommendations to support prompt and accurate diagnosis of heart failure because it is difficult to distinguish between the symptoms and signs of the normal physiological changes of late pregnancy and the pathological symptoms and signs of heart failure. A basic but thorough history and examination are key to identifying women who are at risk and the committee wanted to stress the importance of these.

Although heart failure in the intrapartum period is rare, it is an important cause of maternal mortality. Prompt medical management is needed to stabilise the woman's immediate condition but a change to the obstetric management may also be necessary to improve or limit worsening of

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

her heart condition.

How the recommendations might affect practice

The recommendations largely reflect current best practice. The committee agreed they should reinforce practice as well as improving postnatal prescribing and encouraging these women to breastfeed.

Full details of the evidence and the committee's discussion are in evidence review C: heart disease.

Anaesthesia and analgesia for women with heart disease

Recommendations 1.3.32 to 1.3.40

Why the committee made the recommendations

Evidence identified was very limited so the committee made recommendations based on their knowledge and experience. The committee wanted to promote the best medical opinion while also taking into account women's needs and wishes. Regional anaesthesia offers several benefits over general anaesthesia that are still relevant even when a woman has a heart condition.

The committee was aware that the type of anaesthesia that women with heart conditions receive can vary according to the attending anaesthetist's experience and technical expertise. Enhanced haemodynamic stability can be achieved using low-dose sequential combined spinal–epidural or carefully titrated continuous spinal catheter techniques. Therefore obstetric anaesthetists and cardiac anaesthetists should collaborate to provide the best anaesthetic option for cardiovascular stability for the woman. They agreed that information should be shared with the woman so the best outcomes can be achieved. Women with modified World Health Organization (WHO) 1 or modified WHO 2 heart disease should be given the same advice as described in the NICE guideline on intrapartum care for healthy women and babies.

Based on knowledge of the physiological consequences of pain and the evidence that regional analgesia provides the most complete pain relief in labour, the committee agreed that to minimise the risks of labour without adversely affecting the woman's heart condition, women with modified WHO 3 and modified WHO 4 heart disease should be offered regional analgesia for labour. These women have critical heart failure and life-threatening heart disease and need to be carefully monitored to avoid serious mortality and morbidity.

Women who have not had a prophylactic dose of low-molecular-weight heparin for 12 hours or a

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

therapeutic dose for at least 24 hours could be considered for regional analgesia because, the committee agreed, after this time the risk of bleeding from regional analgesia is considered to be very low.

The committee also agreed it was important to acknowledge those women who remain on low-molecular-weight heparin, and to provide details regarding the appropriate timing for removal of the epidural catheter.

How the recommendations might affect practice

Most pregnant women with severe heart disease are already offered care in large obstetric-led units with links to cardiac centres. Therefore, these recommendations reinforce current practice and are unlikely to lead to a change. The recommendation that women with WHO 1 and 2 heart disease should be treated as healthy women may reduce unnecessary change in routine intrapartum practice.

Full details of the evidence and the committee's discussion are in evidence review C: heart disease.

Management of the third stage of labour for women with heart disease

Recommendations 1.3.41 to 1.3.44

Why the committee made the recommendations

The committee agreed that heart disease covers a spectrum of pathologies, which have different risks associated with management of the third stage of labour. The only evidence was limited, came from a single study and was not helpful in determining management options for women with various heart conditions. Therefore the committee made recommendations based on their knowledge and experience. A management plan developed with multidisciplinary expertise is needed for each woman. Women with less severe heart conditions have similar risks to normal healthy women in the third stage of labour and can be managed accordingly. Because the physiological management of the third stage of labour is associated with a higher risk of postpartum haemorrhage, women with WHO 2 heart disease should have the third stage actively managed. Active management is also needed for all women with more severe disease. Oxytocin is the uterotonic of first choice. Second-line options depend on the specific condition. Women with preload-dependent circulation are particularly vulnerable to falls in blood pressure and there is some evidence to suggest that oxytocin should be given as an infusion rather than bolus to avoid this.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Ergometrine and oxytocin, 2 of the most commonly administered uterotonic agents, are known to have significant cardiovascular side effects and may be contraindicated in some women with heart disease. However, management of the third stage of labour should not put women with heart disease at increased risk of postpartum haemorrhage because some of these women will tolerate even minor haemorrhage very poorly. The women at potential risk of adverse effects from oxytocin are also those who are at greatest risk if they have a postpartum haemorrhage. The committee took all these factors into account when developing recommendations.

How the recommendations might affect practice

The recommendations largely reflect current practice. The committee agreed there should be little change, with the exception of reducing the use of long-acting forms of oxytocin.

Full details of the evidence and the committee's discussion are in evidence review C: heart disease.

Return to recommendations

Analgesia for women with asthma

Recommendation 1.4.1

Why the committee made the recommendation

No evidence was found on harm from any form of pain relief during labour for women with asthma. In the absence of evidence, the committee drew on their knowledge and experience to agree that the risk of harm was theoretical, and women with asthma should have the same options for pain relief as women without asthma.

How the recommendation might affect practice

The recommendation should not significantly alter practice, because many hospitals already offer all types of pain relief to women with asthma. Those that do not will have all the options available for women without asthma and so will be able to quickly implement the recommendation.

Full details of the evidence and the committee's discussion are in evidence review D: asthma.

Prostaglandins for women with asthma

Recommendations 1.4.2 to 1.4.4

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Why the committee made the recommendations

Very limited evidence indicated that prostaglandins E1 and E2 did not worsen asthma and this was in line with the committee's experience. The committee agreed to recommend prostaglandins E1 and E2 as options for inducing labour in women with asthma, and prostaglandin E1 for postpartum haemorrhage, because these are the options for women without asthma. However, the committee was concerned about a risk of bronchospasm with prostaglandin F2 alpha and so recommended against it even though it would normally be offered to women without asthma.

How the recommendations might affect practice

Current use of prostaglandins in the intrapartum period is not well documented, but it is thought that practice varies. These recommendations are expected to represent a change in practice, but not a significant resource impact because prostaglandins are already given to women without asthma. Prostaglandin use in women with asthma might increase intensive monitoring of respiratory function during labour or after birth. This would have a resource impact, but would be offset by the reduction in extremely prolonged labour or failed induction, and the impact of postpartum haemorrhage.

Full details of the evidence and the committee's discussion are in evidence review D: asthma.

Return to recommendations

Long-term systemic steroids

Recommendations 1.5.1 to 1.5.4

Why the committee made the recommendations

No evidence was found so the committee used their knowledge and experience to make recommendations. They agreed that women who have been taking long-term steroids (equivalent to 5 mg or more prednisolone daily for more than 3 weeks) are at risk of adrenal crisis when under the physiological stress of labour and birth. The committee recommended that these women continued their regular steroid dose during labour and birth, because the effects of stopping are uncertain and there could be problems restarting the dose in the postpartum period.

They agreed that additional steroids (on top of the normal dose) would be needed to protect against an adrenal crisis. These extra steroids should be given intravenously or intramuscularly because this allows better estimation of the dose absorbed, and avoids the risk of vomiting.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Women taking inhaled or topical steroids would not normally be at risk of adrenal crisis because of the lower doses. These women should not be offered additional steroids during labour and birth unless a specialist agrees this may be needed.

How the recommendations might affect practice

The committee believe that steroids are likely overprescribed for women in labour. Therefore these recommendations might reduce the amount of steroids given, particularly for women taking inhaled or topical steroids. However, because steroids are inexpensive, this is unlikely to have a significant impact on resource use within the NHS in England.

Full details of the evidence and the committee's discussion are in evidence review E: long-term systemic steroids.

Return to recommendations

Regional anaesthesia and analgesia for women with bleeding disorders

Recommendations 1.6.1 and 1.6.2

Why the committee made the recommendations

The limited available evidence was not able to show at which level of platelet count or platelet function the risk of complications, such as epidural haematoma, starts to increase. Evidence reported no serious harm (such as epidural haematoma) from regional analgesia or anaesthesia even with a platelet count below 50×10^9/l. Bleeding complications are more likely with epidural rather than spinal techniques (because smaller needles are used for the latter). The committee agreed that sometimes they would consider regional analgesia and anaesthesia (especially spinal techniques) for women with low platelet counts. Because serious maternal complications are so rare, the evidence did not allow a definite conclusion that there was no significant risk associated with epidural analgesia when platelet count was low. The committee decided not to set a definitive platelet threshold below which epidural or spinal analgesia should not be considered, but agreed that overall bleeding risk (including, but not limited to, platelet count) should be taken into account. Benefits and risks should be discussed with women, because the risk-benefit ratio will be highly individual and could change in the intrapartum period.

How the recommendations might affect practice

The recommendations are in line with current NHS practice.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Full details of the evidence and the committee's discussion are in evidence review F: bleeding disorders.

Modifying the birth plan according to platelet count or function

Recommendations 1.6.3 to 1.6.6

Why the committee made the recommendations

No evidence was identified on platelet count and level of platelet function at which risks for either the woman or her baby would increase. Therefore the committee made recommendations based on their knowledge and expertise. Women with gestational thrombocytopenia are generally considered at low risk of bleeding complications during birth, whereas women with immune thrombocytopenic purpura (ITP) are regarded as high risk. So the committee recommended significant changes to the birth plan only if the woman had ITP, or gestational thrombocytopenia with a low platelet count.

Women with ITP may have a low platelet count and high risk of bleeding while the baby has a normal platelet count and low risk of bleeding. Conversely, a woman with ITP may have a normal platelet count and a baby with a low platelet count and high risk of bleeding. In other words, for women with ITP, the bleeding risk of the woman does not correspond to the bleeding risk of the baby. Consequently, if the woman has ITP, it is safest to treat the baby as being at high risk of bleeding, and modify the birth plan to reduce the bleeding risk to the baby wherever possible, for example, by not carrying out any fetal blood sampling. The committee thought it important to remind the healthcare professional that, because of the risk of fetal bleeding, procedures using fetal scalp electrodes and mid-cavity or rotational forceps should be carried out with extra care.

Women with gestational thrombocytopenia do not have an alloantibody that affects the fetal platelet count. Gestational thrombocytopenia therefore only puts the woman at risk of bleeding, and not her baby.

How the recommendations might affect practice

Women with ITP are at high risk of bleeding and so should give birth in an obstetric unit with a neonatal unit that routinely provides high-dependency care. However, the committee was aware that this does not always happen in practice, and so the recommendation could create more demand for high-dependency neonatal units. However, this might be offset by women at lower risk (for example, with gestational thrombocytopenia and a high platelet count) not being referred to these units.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Full details of the evidence and the committee's discussion are in evidence review F: bleeding disorders.

Management of the third stage of labour for women with bleeding disorders

Recommendations 1.6.7 to 1.6.12

Why the committee made the recommendations

The committee based the recommendations on their knowledge and experience because the evidence was very limited. A number of bleeding disorders can affect the third stage of labour but evidence was not found for all these conditions. In addition, it was not always possible to tell whether an outcome was linked to a treatment or a specific condition because conditions were sometimes grouped together according to severity.

The risk to a woman's life from postpartum haemorrhage is greater if she has a bleeding disorder. To reduce postpartum haemorrhage, the committee recommended active management of labour (rather than physiological management), which includes intramuscular oxytocin, clamping of the cord and controlled cord traction, as described in the NICE guideline on intrapartum care for healthy women and babies.

Women with bleeding disorders may need some adjustments to active management of labour. For example, there may be risks associated with intramuscular injections in these women. These considerations will need oversight from a senior haematologist, more frequent and possibly extended monitoring, and discussion of any changes in clinical condition.

How the recommendations might affect practice

These recommendations should lead to fewer attempts at physiological management of the third stage in women with bleeding disorders, with fewer postpartum haemorrhages and reduced maternal morbidity. The recommendations will apply to a small number of women, so implementing them is unlikely to cause staffing or resource issues for hospitals.

Full details of the evidence and the committee's discussion are in evidence review F: bleeding disorders.

Return to recommendations

Mode of birth and management of the second stage of labour for women with

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

subarachnoid haemorrhage or arteriovenous malformation of the brain

Recommendations 1.7.1 to 1.7.9

Why the committee made the recommendations

Although the available evidence showed that there were no maternal or neonatal deaths or morbidities related to maternal cerebrovascular malformation or a history of intracranial bleeding, the committee agreed that there was not enough evidence to justify changing practice for women at high risk of an intracranial bleed. Current practice is to manage the bleeding risk as conservatively as possible.

Although vaginal birth is an option for women at low risk of intracranial bleeding, the committee acknowledged that some women would choose a caesarean section because of the theoretical risk of a bleed. The committee agreed that mode of birth should be based on the woman's preference as well as obstetric indications.

In women at high risk, or unknown risk (for example, because they have presented in labour with no antenatal care), the committee decided that in theory a caesarean section reduces the risk of intracranial bleeding because it should reduce the risks of raised intracranial pressure. This theoretical reduction in risk justified caesarean section for this group. The committee added that if a woman at high risk wanted to go into labour, the benefits and risks of an assisted second stage of labour compared with active pushing alone should be explained to the woman to ensure that steps are taken to reduce the risk of intracranial bleeding.

The committee knew that there was sometimes a reluctance to offer regional analgesia and anaesthesia to women with a history of subarachnoid haemorrhage or arteriovenous malformation of the brain because of the possibility of provoking a bleed. They discussed that this was extremely unlikely unless there was a genetic predisposition to multiple cerebrovascular malformations or unknown genetic history. They agreed that most women should be able to choose regional analgesia if they wished.

The committee was aware that cerebrovascular malformations affect more than 3% of the population and that women with cerebrovascular malformations or a previous subarachnoid haemorrhage are at risk of a potentially life-threatening cerebral haemorrhage. In current practice, many women with cerebrovascular malformations will be offered a caesarean section. However, it is uncertain whether vaginal birth increases the risk of cerebral haemorrhage in these women and the committee agreed to make a research recommendation to inform future guidance.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

How the recommendations might affect practice

The recommendations are in line with current practice for women at high risk, but many healthcare professionals would currently offer an elective caesarean section to women at low risk. So these recommendations could lead to a major change in practice for these women, with fewer caesarean sections. This assumes that their obstetric indications and personal preferences are similar to those of the general population of women.

Full details of the evidence and the committee's discussion are in evidence review G: subarachnoid haemorrhage or arterio-venous malformation of the brain.

Return to recommendations

Fluid management for women with kidney disease

Recommendations 1.8.1 to 1.8.9

Why the committee made the recommendations

Managing fluid balance in women with kidney disease during pregnancy is extremely difficult – dehydration can cause acute kidney injury, especially in those with underlying chronic kidney disease, but fluid overload can rapidly lead to pulmonary oedema, especially in women with superimposed pre-eclampsia.

Although there was limited evidence on fluid management, its importance has been emphasised by successive confidential enquiries. The committee agreed that fluid management would vary, depending on the clinical condition of the woman and her baby.

The committee knew from their experience that action could often be taken to improve outcomes if the issue was identified in time. Therefore they recommended regular frequent monitoring every 4 hours during the intrapartum period (in addition to routinely measuring hourly heart rate), including monitoring after birth. Because oliguria is very common in healthy women in the postpartum period, the assessment of urine output more frequently than every 4 hours can be misleading. Exactly what should be monitored would depend on the clinical condition of the woman, but would include observations to assess fluid status, including blood pressure, chest sounds, fluid intake and output, and oxygen saturation.

The committee agreed that it was important to remind professionals caring for women in labour and during birth that commonly used drugs that are known to be nephrotoxic (for example, non-

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

steroidal anti-inflammatory drugs) should not be offered to women with chronic kidney disease or acute kidney injury.

How the recommendations might affect practice

Current practice is highly variable. The recommendations will mean more observation of women with kidney disease, with increased work for healthcare professionals. But they should lead to significantly fewer instances of morbidity.

The committee agreed that women with pre-existing chronic kidney disease are particularly vulnerable to both acute kidney injury and pre-eclampsia. By managing fluid balance more effectively, the risk of acute kidney injury in women with chronic kidney disease can be reduced. This will improve short- and longer-term outcomes for women and benefit healthcare systems with reduced length of stay.

Full details of the evidence and the committee's discussion are in evidence review H: acute kidney injury or chronic kidney disease.

Timing and mode of birth for women with kidney disease

Recommendations 1.8.10 to 1.8.16

Why the committee made the recommendations

No evidence was found for timing of birth for women with kidney disease but the committee agreed that this would depend on the extent of the impairment. Longer gestation leads to better outcomes for the baby but may lead to worse outcomes for the woman's kidney function. Therefore, when kidney disease is less severe (chronic kidney disease stage 1, or stages 2 to 4 with stable kidney function), the balance of benefits and harms favours allowing the baby as long as possible to develop without becoming overdue. The committee agreed that when there is a significant risk to the mother's life in allowing the pregnancy to continue, dialysis should be attempted to prolong the pregnancy until at least 34^{+0} weeks, with a planned birth after this. In the committee's experience, this offers the least risk to mother and baby, and allows as many women as possible to have the birth of their choice.

There was no evidence that any particular mode of birth was better or worse for women with kidney disease and this was in line with the committee's experience, and so decisions about the mode of birth should be based on the woman's preference and obstetric indications. However, the committee recommended that for women with a kidney transplant, a transplant surgeon should be

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

involved in the intrapartum care planning early on in the antenatal period. This is important particularly if a caesarean section is planned because the transplanted kidney will often be positioned near the usual site of caesarean incision and is therefore at risk of damage. The committee agreed that access to a transplant surgeon, if the caesarean section was complicated, should be recommended.

How the recommendations might affect practice

The recommendations are likely to lead to a change in practice in many areas. This is because currently some healthcare professionals only offer early birth to women with the most significant kidney disease. However, others recommend early birth to women who could safely carry the pregnancy a few weeks longer.

Full details of the evidence and the committee's discussion are in evidence review H: acute kidney injury or chronic kidney disease.

Return to recommendations

Assessing fetal presentation early in labour for women with a BMI over 30

Recommendation 1.9.1

Why the committee made the recommendation

The NICE guideline on intrapartum care for healthy women and babies recommends that women with a BMI under 35 kg/m^2 can give birth in a midwifery unit or at home. The committee agreed, based on their experience, that identifying the fetal position by palpation can be difficult in women who are obese, particularly when the BMI is over 35 kg/m^2. The degree of confidence in palpation often decreases with increasing body weight.

Ultrasound scanning at the start of established labour can help with decision making when the baby's presentation is uncertain. The consequences of missing a malpresentation are more serious in women who are obese, who are already at a higher risk of operative interventions in labour. The committee agreed that healthcare professionals should consider ultrasound scanning at the start of established labour when presentation is uncertain and a woman is obese. This should reduce the likelihood of adverse outcomes for the woman and her baby.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

How the recommendation might affect practice

The recommendation reflects current practice.

Full details of the evidence and the committee's discussion are in evidence review I: obesity.

Anaesthesia and analgesia for women with a BMI over 30

Research recommendation 2

Why the committee did not make a recommendation and made a research recommendation

The committee was aware that women who are obese are more likely to need anaesthesia during labour and birth. The rates of operative birth are much higher in this group, particularly in women with a BMI over 40 kg/m2. It's helpful for care planning if an anaesthetist is told when a woman with a BMI over 40 kg/m2 is admitted. Needle siting for anaesthesia is potentially more difficult in women who are obese because the surface landmark anatomy of the lumbar spine can be more difficult to identify. It is thought that there are more unsuccessful attempts to site regional analgesia, and ultrasound might be cost effective for needle siting in this group. The use of ultrasound for needle siting is increasing with resource implications for the NHS. The committee could not make a recommendation on the most appropriate technique for needle siting because the evidence was uncertain, but they agreed to make a research recommendation to inform future guidance.

Full details of the evidence and the committee's discussion are in evidence review I: obesity.

Fetal monitoring for women with a BMI over 30

Recommendation 1.9.2

Why the committee made the recommendation

It is more difficult to monitor fetal heart rate, uterine contractions and fetal position in women who are obese. These women are likely to have more complications and growth restriction is more likely to have been missed from earlier scans, making accurate fetal monitoring particularly important in the intrapartum period.

However, there was no evidence that continuous cardiotocography improves outcomes compared

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

with intermittent auscultation. So the committee agreed to recommend monitoring based on the woman's preference and obstetric indications in line with the NICE guideline on intrapartum care for health women and babies.

There is variation in management during the intrapartum period for women who are obese. This is because of a lack of agreement on whether women with uncomplicated obesity should be offered continuous fetal monitoring in labour, receive further antenatal ultrasound scanning, including amniotic fluid volume assessment and umbilical artery Doppler scans, or be offered early induction.

Research to date has not established the effect of stratified BMI on perinatal outcomes. Current research is mainly retrospective, using data dating back to the 1970s and 1980s when BMI was usually self-reported and not stratified according to WHO categorisation. The committee agreed to make a research recommendation to inform future guidance.

How the recommendation might affect practice

There is a wide variation in the use of continuous cardiotocography and intermittent auscultation for women who are obese. However, the recommendation is unlikely to mean a large change in current practice.

Full details of the evidence and the committee's discussion are in evidence review I: obesity.

Position in labour for women with a BMI over 30

Recommendations 1.9.3 to 1.9.5

Why the committee made the recommendations

Based on their experience, the committee agreed that there was no reason to alter the advice on the position in the second stage of labour just because a woman is obese. But it is important that she has enough mobility to allow healthcare professionals access in an emergency (for example, the ability to get into the lateral position). For women who have significantly reduced mobility, the committee recommended the lateral position to begin with, because this allows good access and so reduces the risk of adverse events. The committee agreed that these decisions should be made in the third trimester after a risk assessment, to ensure that everyone is aware of the plans for managing the second stage.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

How the recommendations might affect practice

Most midwives know that the lateral position is the safest for women with reduced mobility in labour. Therefore the recommendations are unlikely to lead to a change in practice. The recommendations for women with sufficient mobility are the same as those in the NICE guideline on intrapartum care for healthy women and babies. They should not change practice unless healthcare professionals are unaware that the recommendations in this NICE guideline also apply to women who are obese.

Full details of the evidence and the committee's discussion are in evidence review I: obesity.

Equipment needs for women in labour with a BMI over 30

Recommendations 1.9.6 to 1.9.8

Why the committee made the recommendations

The committee agreed that women who are obese need specialist equipment for a safe birth. They described all the specialist equipment required; not just beds and wheelchairs but specialist surgical tools and monitoring equipment. The committee did not believe that every hospital would have all this equipment, particularly to deal with women with a BMI over 50 kg/m^2. They agreed that referral to another obstetric unit should be considered when this is the case to ensure that the needs of the women are adequately met.

How the recommendations might affect practice

A 2010 report from the Confidential Enquiry into Maternal and Child Health (CMACE) and the Royal College of Obstetrics and Gynaecologists identified major gaps in the provision of hospital equipment for pregnant women who are obese. The committee believed that this has significantly improved and therefore that – for the most part – the recommendations should not affect practice. They should, however, reinforce what hospitals should already be providing.

Full details of the evidence and the committee's discussion are in evidence review I: obesity.

Return to recommendations

Information for women with obstetric complications or no antenatal care

Recommendations 1.10.1 to 1.10.6

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Why the committee made the recommendations

Evidence was limited but the committee agreed that good quality information is important for women who are at increased risk of serious medical problems for themselves or their babies. These women are likely to be more anxious than other women in labour and need information that presents risk in a way that they can understand. The information should be based on local and national data where possible to allow women to make informed choices. Healthcare professionals should recognise that individuals have their own views of risk and they should support women to make informed decisions about their care. The committee recognised that the evidence base was limited but showed that women felt they may be given biased information and that some options were not offered or were actively opposed. Women described having to search out information themselves. The evidence also suggested that there may be inequalities between women when it comes to making an informed decision and being in control of their care. Women who were not able to seek information could be disadvantaged in making informed choices. The committee noted that these themes were reflected by their own experiences and agreed that it is very important that information about all options is offered to women.

How the recommendations might affect practice

The committee noted that there was variability in current practice relating to care of women in labour who have a higher chance of serious medical problems. The recommendations may result in a change in practice in some areas, with a change in focus from a risk-based approach to supporting informed decision making for all women.

Full details of the evidence and the committee's discussion are in evidence review J: information for women with obstetric complications or no antenatal care.

Return to recommendations

Risk assessment for women with obstetric complications or no antenatal care

Recommendations 1.11.1 to 1.11.7

Why the committee made the recommendations

No evidence was found on observations for women in labour with obstetric complications so the committee made recommendations based on their expertise and knowledge of good practice. They agreed that in order to understand the whole clinical picture, it is important to listen to the woman's concerns and her own account of her symptoms. The committee acknowledged that

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

women in the following groups would only need routine maternal observations during labour if there were no other concerns:

- breech presentation
- suspected small-for-gestational-age baby
- suspected large-for-gestational-age baby
- previous caesarean section
- labour after 42 weeks of pregnancy
- no antenatal care.

The committee did not want to medicalise care for women with fever in labour and agreed that many of these women do not need additional maternal observations apart from hourly monitoring of temperature and level of consciousness (AVPU [alert, voice, pain, unresponsive]), and 4-hourly monitoring of respiratory rate and oxygen saturation. However, if other symptoms or signs develop, the possibility of sepsis should be considered.

The committee did not want to medicalise care for women with slight concerns about possible sepsis, but they agreed that if concerns are enough to warrant antibiotic treatment, more frequent observations are needed because of the risk of sudden deterioration. The committee recommended continuous or half-hourly measurement of pulse, blood pressure and respiratory rate in line with the NICE guideline on sepsis. Hourly monitoring of temperature is sufficient, but AVPU should be monitored every half hour, with continuous or 30-minute monitoring of oxygen saturation. Hourly recording of urine output should be performed if the woman has a catheter.

The committee agreed that for women with intrapartum haemorrhage, continuous monitoring of vaginal blood loss is important because this is often underestimated and it can be difficult to decide when more action is needed. Therefore the committee recommended more frequent observations to detect possible changes in a woman's condition. They also recommended other observations such as respiratory rate, volume of urine output, AVPU and oxygen saturation to prompt transfer to an obstetric-led unit and involvement of a senior obstetrician if needed.

Because of the increased risk of serious medical problems in women with obstetric complications or no antenatal care and the need for timely action when indicated, it is important that the woman's condition is comprehensively reviewed by an experienced healthcare professional who should be responsible for deciding if there is a need to escalate care. The committee was aware that the risk

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

of serious medical problems for the woman or the baby depends on the whole clinical picture. They recommended that this should be taken into account when discussing options for care with the woman during the intrapartum period.

The lack of evidence on maternal observations for women in labour with suspected sepsis prompted the committee to make a research recommendation to inform future guidance.

How the recommendations might affect practice

The committee agreed that the recommendations reflect current best practice, but this may result in changing practice in some units.

Full details of the evidence and the committee's discussion are in evidence review K: risk assessment for women with obstetric complications or no antenatal care.

Return to recommendations

Use of antipyretics for women in labour with a fever

Recommendations 1.12.1 and 1.12.2

Why the committee made the recommendations

Very limited evidence showed no difference in the rate of caesarean section or admission to neonatal intensive care when women had paracetamol for fever. However, the committee agreed that paracetamol is safe and can reduce discomfort when a woman has a temperature. They noted that fever can be a sign of sepsis and agreed that recognising and treating sepsis is a clinical priority. Because paracetamol may mask a worsening fever, they recommended that healthcare professionals should remember that paracetamol is not a treatment for sepsis and should not delay investigation and treatment when sepsis is suspected.

How the recommendations might affect practice

The recommendations could reduce the inappropriate use of paracetamol and promote the prompt management of sepsis.

Full details of the evidence and the committee's discussion are in evidence review L: pyrexia.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Fetal blood sampling for women in labour with a fever

Recommendation 1.12.3

Why the committee made the recommendation

No evidence was found on fetal blood sampling for women in labour with a fever so the committee made a recommendation based on their expertise and knowledge of good practice. Their view was that women with fever in labour should be treated as if they have suspected sepsis for the purpose of fetal blood sampling and so the recommendations in this section mirror those for sepsis and suspected sepsis.

How the recommendation might affect practice

The recommendation should harmonise practice, potentially increasing use of fetal blood sampling in areas where healthcare professionals are overly cautious and decreasing use in places where multiple fetal blood samples are taken.

Full details of the evidence and the committee's discussion are in evidence review L: pyrexia.

Return to recommendations

Mode of birth for women with sepsis or suspected sepsis

Recommendations 1.13.1 to 1.13.10

Why the committee made the recommendations

No evidence was found on mode of birth for women in labour with sepsis or suspected sepsis so the committee made recommendations based on their expertise and knowledge of good practice. They recognised that sepsis is an important cause of maternal mortality and that physiological changes during labour may mask the early signs of sepsis. There is no agreed definition of normal physiological adjustments occurring during pregnancy and labour and these can vary as labour progresses.

The committee agreed that the NICE guideline on sepsis should be followed for the recognition of sepsis in pregnant women and that normal physiological changes in labour (such as increased maternal pulse rate) should also be taken into account.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

The committee agreed that there should be ongoing multidisciplinary review by a senior team with a named lead. Ongoing review means the team is prepared to react to a changing situation, which may alter very quickly. The committee agreed that inadequate or delayed maternal resuscitation may worsen organ dysfunction and have an impact on the safety of anaesthesia, so they recommended that a senior obstetric anaesthetist should be included in the team.

When a woman in labour has sepsis (rather than suspected sepsis), the team should be expanded to include a neonatologist and microbiologist, and for women with sepsis and manifestations of organ dysfunction, the team should be further expanded to include a senior intensivist (critical care specialist). The intention is that the multidisciplinary team may not meet face to face but that expert advice can be accessed when needed.

The committee noted that a clear management plan should be documented and reviewed on a regular basis because it is important not only for the multidisciplinary team but also for the woman to know what is happening.

The committee emphasised that the woman and her birth companion(s) should be involved in shared decision making about management because they need to be involved in decisions and choices about how to proceed.

All options for timing and mode of birth should be considered in discussion with the woman and it should not be assumed that caesarean section is the only option for women with sepsis or suspected sepsis. The committee agreed that when the source of sepsis is thought to be the genital tract, healthcare professionals should expedite the birth because there is an increased risk of adverse outcomes for the baby.

How the recommendations might affect practice

The committee agreed that the recommendations reflect current best practice. This may result in changing practice in some units.

Full details of the evidence and the committee's discussion are in evidence review M: sepsis.

Anaesthesia for women in labour with sepsis and signs of organ dysfunction

Recommendation 1.13.11

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Why the committee made the recommendation

No evidence was found on anaesthesia for women in labour with sepsis or suspected sepsis so the committee made recommendations based on their expertise and knowledge of good practice. They wanted to ensure that women in labour with sepsis and signs of organ dysfunction were offered anaesthesia appropriate to their clinical condition and noted that the default practice of using regional anaesthesia may not be appropriate for these women. The committee agreed that regional anaesthesia may be associated with cardiovascular instability when there is sepsis with signs of organ dysfunction. Other adverse outcomes may include epidural abscess and haematoma due to coagulopathy. This led the committee to recommend that regional anaesthesia should be used only with caution and advice from a consultant obstetric anaesthetist and in the presence of a senior anaesthetist.

How the recommendation might affect practice

The committee agreed that the recommendation reflects current best practice so there should be no change in practice.

Full details of the evidence and the committee's discussion are in evidence review M: sepsis.

Analgesia for women in labour with sepsis or suspected sepsis

Recommendations 1.13.12 to 1.13.16

Why the committee made the recommendations

No evidence was found to recommend one form of pain relief over another for women in labour with sepsis or suspected sepsis. The committee was aware that women with sepsis and signs of organ dysfunction may have bacteraemia and an increased risk of local infection or meningitis when a needle is inserted for regional analgesia. Therefore they recommended that this should only be used with caution and only with advice from a consultant obstetric anaesthetist. The presence of a senior anaesthetist is not needed because of the lower dose of local anaesthetic used for a woman who is not having surgery.

Although there was no evidence that the use of the birthing pool is contraindicated for women in labour with suspected sepsis where concern is insufficient for antibiotic treatment, the committee used their clinical experience and expertise to recommend that for these women, the birthing pool should be considered only after discussion with a senior midwife and a senior obstetrician.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

The committee also made a recommendation that for women needing antibiotics for suspected sepsis, the treatment should begin before inserting the needle for regional analgesia.

A multidisciplinary review of options for pain relief is recommended at least every 4 hours because usually the multidisciplinary team would not be involved this often.

How the recommendations might affect practice

The committee was aware that currently the birthing pool would not be considered for some women with suspected sepsis where concern is insufficient for antibiotic treatment. The committee noted that there is variation in practice not only between units but also within obstetric units. Therefore the extent of change in practice will vary according to current practice.

The committee noted that use of prophylactic antibiotics in women with suspected sepsis before central neuraxial block is not currently universal practice in the UK. The committee's recommendation would reinforce current best practice.

Regular reviews with a minimum 4-hour frequency are a change to current practice. Currently reviews are performed as and when needed. The committee agreed that recommending a minimum review frequency was a more proactive approach to supporting women's ongoing needs.

The committee was aware that a discussion with a senior anaesthetist did not always happen in current practice, and their recommendations would reinforce best practice.

Full details of the evidence and the committee's discussion are in evidence review M: sepsis.

Fetal monitoring for women in labour with sepsis or suspected sepsis

Recommendations 1.13.17 to 1.13.21

Why the committee made the recommendations

No evidence was found on fetal monitoring for women in labour with sepsis or suspected sepsis so the committee made recommendations based on their expertise and knowledge of good practice. The committee wanted healthcare professionals to explain to women with sepsis that there is uncertainty about the usefulness of fetal blood sampling so that women have more information when deciding whether to accept or decline testing. The committee also agreed that fetal blood sampling can be falsely reassuring when a woman has sepsis. They wished to emphasise that the whole clinical picture should influence the decision to perform sampling and should be taken into

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

account when interpreting the results.

There is no evidence to support repeat fetal blood sampling so the committee wanted to highlight the need for caution and consultant obstetric input to guide decision making.

How the recommendations might affect practice

The committee hoped the recommendations would harmonise practice, potentially increasing use of fetal blood sampling in areas where clinicians are overly cautious and decreasing use in places where multiple fetal blood samples are taken.

Full details of the evidence and the committee's discussion are in evidence review M: sepsis.

Antimicrobial treatment for women in labour with sepsis or suspected sepsis

Recommendations 1.13.22 to 1.13.25

Why the committee made the recommendations

No evidence was found on when to start antimicrobial treatment for women in labour with sepsis or suspected sepsis so the committee made recommendations based on their expertise and knowledge of good practice. The committee was aware that intrapartum sepsis presents unique diagnostic difficulties, including difficulties identifying the source of the infection, which can lead to under- or over-diagnosis of sepsis. The choice of antibiotics is influenced by concerns about safety for the baby.

No evidence was found to support the use of specific antimicrobials in labour when the source of infection is clear and therefore the committee decided to follow the NICE guideline on sepsis and recommend referring to local antimicrobial guidance.

When the source of infection is unclear, a broad-spectrum intravenous antimicrobial from the local formulary should be offered because intrauterine infection is the most likely source of the infection and is often due to multiple organisms (polymicrobial).

The committee was aware that local antimicrobial resistance patterns vary and that the choice of antimicrobial would be guided by this. The committee was keen to support shared decision making and to ensure that the woman and her birth companion(s) understood the reasons for the choice of antimicrobial.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

How the recommendations might affect practice

The recommendations reflect current best practice.

Full details of the evidence and the committee's discussion are in evidence review M: sepsis.

Care for women with sepsis or suspected sepsis immediately after the birth

Recommendation 1.13.26

Why the committee made the recommendation

No evidence was found on care for women with sepsis or suspected sepsis in the first 24 hours after the birth so the committee made recommendations based on their expertise and knowledge of good practice. They agreed that a team with a named lead should provide care. The committee felt that determining the need for antibiotics, frequency of monitoring and level of care were important both for the safety of the woman and avoiding separation from her baby. The committee was aware that the woman and baby are often separated if the woman is transferred to a general intensive care unit or high-dependency unit, and this can impact negatively on the developing relationship between the woman and her baby, and consequently on maternal emotional wellbeing and postnatal mental health.

Families expect women who have given birth to be discharged home in full health soon after the birth. If the woman develops intrapartum sepsis, additional practical and emotional support will be needed during the recovery from critical illness.

How the recommendation might affect practice

The recommendation reflects current best practice and should improve practice in some areas, particularly around reducing separation of women and their babies.

Full details of the evidence and the committee's discussion are in evidence review M: sepsis.

Return to recommendations

Intrapartum haemorrhage

Recommendations 1.14.1 to 1.14.10

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Why the committee made the recommendations

No evidence was found on management of intrapartum haemorrhage so the committee based recommendations on their expertise and knowledge of good practice and the recommendations for postpartum haemorrhage in the NICE guideline on intrapartum care for healthy women and babies. They agreed that a large blood loss may result in major shock, and this would be the first priority for treatment. They also agreed that it is good practice that all maternity settings are equipped to manage intrapartum haemorrhage.

The committee agreed that when vaginal blood loss is more than a show, it is important to transfer the woman to obstetric-led care. They also agreed that it was essential to talk with the woman and her birth companion(s) to explain what is happening, what may happen and understand her preferences. It is also important to determine the likely causes of the blood loss, and how the woman's health may deteriorate or stabilise. The committee agreed that speaking with the woman to gain the history, including any associated events, may help to determine the cause of bleeding.

The committee agreed that if a woman in labour has vaginal blood loss typical of a 'show', this is not detrimental to the woman or baby and for these women, the NICE guideline on intrapartum care for healthy women and babies should be followed.

How the recommendations might affect practice

The recommendations reflect current best practice but this may mean a change practice in some units.

Full details of the evidence and the committee's discussion are in evidence review N: intrapartum haemorrhage.

Return to recommendations

Breech presenting in labour

Recommendations 1.15.1 to 1.15.4

Why the committee made the recommendations

Evidence showed an increase in maternal infection and other maternal complications during the first 6 weeks after caesarean section in labour for breech presentation compared with vaginal breech birth. This was in line with the committee's experience.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Evidence showed fewer adverse outcomes for the baby after caesarean section in early labour for breech presentation compared with vaginal birth, but the benefit was less clear when caesarean section was performed in the later stages of labour. This was also in line with the committee's experience.

The committee acknowledged that offering a choice between continuing labour and emergency caesarean section may differ from the advice that women with breech presentation have received during pregnancy. This is because the balance of risks to the woman and baby have changed, with different considerations coming into play when the woman is in labour. For example, considerations will be different when breech presentation is first identified in labour, or when labour is more advanced. The committee wished to ensure that healthcare professionals give women the opportunity to make an informed choice about mode of birth in this situation. They agreed not to recommend one mode of birth over another, but that following discussion of the likely benefits and risks, a woman should be able to decide what is right for her.

Based on their knowledge and experience, the committee agreed that healthcare professionals should follow recommendations on assessing progress in labour in the NICE guideline on intrapartum care for healthy women and babies to avoid unnecessary intervention when there is a delay in labour.

How the recommendations might affect practice

There is variation in practice regarding counselling in labour for women with breech presentation, following publication of the Term Breech Trial in 2000, which concluded that vaginal birth was associated with higher risks to the baby. The recommendation to offer women in labour with breech presentation a choice between continuing labour and emergency caesarean section will promote a more consistent approach and improved experience for women and their birth companion(s). Practice previously would frequently have been to recommend caesarean section for these women, whereas the guideline recommendations emphasise choice and informed decision making.

The committee was aware that training may be needed to fully implement the recommendations supporting vaginal breech birth.

Full details of the evidence and the committee's discussion are in evidence review O: breech presenting in labour.

Return to recommendations

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Small-for-gestational-age baby

Recommendations 1.16.1 to 1.16.3

Why the committee made the recommendations

No evidence was found for monitoring in labour for babies suspected to be small for gestational age so the committee used their knowledge and experience to make recommendations. They agreed that babies who are small for gestational age are at risk of adverse outcomes and that this risk is higher when there is growth restriction or problems with birth. However, they acknowledged that it is difficult to be certain about the baby's size before birth. Healthcare professionals should explain the risks and uncertainties to women whose babies are suspected to be small for gestational age and such women should then be offered continuous cardiotocography so that any concerns for the baby can be picked up quickly.

How the recommendations might affect practice

The committee agreed that the recommendations reflect current best practice so there should be no change. However, they acknowledged that women are currently often not informed about the uncertainty around diagnosis of small-for-gestational-age babies and the effectiveness of cardiotocography in preventing poor outcomes, so this will be a development in practice.

Full details of the evidence and the committee's discussion are in evidence review P: small-for-gestational-age baby.

Return to recommendations

Large-for-gestational-age baby

Recommendations 1.17.1 to 1.17.3

Why the committee made the recommendations

There was no convincing evidence for one mode of birth over another for women in labour whose babies are suspected to be large for gestational age. The committee discussed the difficulty of estimating a baby's size when a woman is in labour. They acknowledged that ultrasound is difficult to perform in labour and is less accurate at estimating a baby's weight than in the antenatal period. They agreed that women should be told about this uncertainty. Evidence showed an increased risk of maternal infection when women in labour had an emergency caesarean section. In the

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

committee's experience, there was a risk of shoulder dystocia and perineal trauma with vaginal birth. The committee agreed that women should be provided with information so that they can make their own decisions about mode of birth when their baby may be large for gestational age.

How the recommendations might affect practice

The recommendations ensure that women are offered all the options available to them in labour. It is not anticipated that this will have a large impact on resource use.

Full details of the evidence and the committee's discussion are in evidence review Q: large-for-gestational-age baby.

Return to recommendations

No antenatal care

Recommendations 1.18.1 to 1.18.12

Why the committee made the recommendations

No evidence was found on intrapartum care for women who have had no antenatal care so the committee agreed to make recommendations based on their expertise and knowledge of good clinical practice.

Because of the lack of baseline information and a birth plan, intrapartum care for these women should be led by an obstetrician who will carry out a full assessment of the risks for the woman and her baby. The neonatal team should be alerted because the committee agreed that there is an increased risk of serious medical problems for the baby when a woman has had no antenatal care. Sometimes an anaesthetic team may also be needed.

Sensitive enquiry should be made to try to understand the reasons for the lack of antenatal care, as well as to identify any vulnerability and safeguarding issues. It is important to ask the woman who she would like as her birth companion(s) and to identify their relationship with her. If there is a language barrier, an independent interpreter should be used rather than the woman's birth companion(s).

Blood and urine tests normally performed as part of routine antenatal care should be offered to check for markers of anaemia and infection. Therefore, testing for HIV, hepatitis B and syphilis should be offered. Rapid HIV testing should be offered to women who are thought to be at high risk

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

of HIV because steps can be taken to prevent vertical transmission of known HIV infection during vaginal birth. Evidence suggested that rapid HIV testing would offer a good balance of benefits and costs in women at high risk of infection. The test results would be used to plan care during labour, birth and postnatally.

The committee agreed that the woman's GP should be contacted to obtain more information about her history and to plan for her own and the baby's ongoing care. Safeguarding concerns should be considered and if necessary referrals made. The woman should be informed when other healthcare professionals, social care professionals, safeguarding teams or the police need to be contacted. It is also important to document and share information with relevant professionals, such as the paediatric team and local health providers, for continuation of care.

How the recommendations might affect practice

The recommendations largely reflect good clinical practice and therefore will not mean a large change. However, rapid HIV testing is not always available. An assessment of local needs for such services should be done.

Full details of the evidence and the committee's discussion are in evidence review R: no antenatal care.

Return to recommendations

Previous caesarean section

Recommendations 1.19.1 to 1.19.11

Why the committee made the recommendations

No evidence was found for intravenous cannulation for women in labour with a previous caesarean section. The committee agreed that the chance of needing intravenous access for urgent blood transfusion was unlikely to be higher in these women, and so recommended that cannulation should not be routine.

The committee noted from the evidence and their expertise that the risk of uterine rupture with vaginal birth was small for women with a previous caesarean section. There was some evidence that performing an emergency caesarean section in labour is associated with an increased risk of heavy bleeding and the need for blood transfusion, infection and a longer hospital stay. The committee recommended that women should be told about this when making decisions about

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

mode of birth.

The committee felt it was important that women should be made aware that there is no compelling evidence to recommend one mode of birth over another to improve outcomes for the baby.

Evidence indicated that women in labour with a previous caesarean section are likely to be at a lower risk of complications if they have also had a previous vaginal birth.

There was evidence that augmentation of labour with oxytocin and regional analgesia both reduced the chance of another caesarean section for women in labour who have had a caesarean section in the past. The likelihood of an instrumental vaginal birth (forceps or ventouse) was increased with both. The committee agreed that this should be explained to women so that they can make a fully informed decision.

No evidence was found to recommend one form of pain relief over another for women with a previous caesarean section. There was also no evidence that the use of the birthing pool for pain relief is contraindicated for these women. Therefore, the committee agreed to recommend that all forms of pain relief, including the birthing pool, should be offered.

No evidence was found for routine amniotomy in women in labour with previous caesarean section. The committee used their experience and expertise to recommend that this should not be offered.

The committee was aware that continuous cardiotocography is usually advised for women in labour who have had a previous caesarean section, because of an increased risk of serious medical problems for the baby. However, it is uncertain whether continuous cardiotocography in these circumstances allows risk to be identified sooner than if intermittent auscultation is used. The committee agreed include specific recommendations to offer continuous cardiotocography to women in labour with a previous caesarean section if using oxytocin for delay in the first or second stage of labour, or if performing amniotomy, while making a research recommendation to inform future guidance.

How the recommendations might affect practice

The committee recognised there was variation in practice and inequity in the choices available to women in labour with a previous caesarean section. The committee wanted to ensure that these women would be offered comprehensive information so that they could make informed decisions about their care and wellbeing, and would not be subjected to unnecessary interventions that may not improve outcomes for the woman or her baby. They noted that the extent of change in practice

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

arising from the recommendations would vary across the UK based on current practice and that the recommendations may result in specific changes in practice around supporting women's choice of place of birth and routine cannulation in labour, which may in turn lead to cost savings for the healthcare system.

Full details of the evidence and the committee's discussion are in evidence review S: previous caesarean section.

Return to recommendations

Labour after 42 weeks of pregnancy

Recommendation 1.20.1

Why the committee made the recommendation

No evidence was found for monitoring in labour after 42 weeks of pregnancy so the committee made the recommendation based on their knowledge and experience. The committee was aware of some evidence of an increased risk of stillbirth or neonatal death after 42 weeks and this was consistent with their own experience. Because of this, the committee agreed that continuous cardiotocography should be offered for all women in labour after 42 weeks so that any concerns for the baby can be identified quickly. The offer should be preceded by a full discussion of the benefits and risks to the woman and her baby.

How the recommendation might affect practice

The recommendation to offer continuous cardiotocography to all women in labour after 42 weeks is in line with current practice.

Full details of the evidence and the committee's discussion are in evidence review T: labour after 42 weeks of pregnancy.

Return to recommendations

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Context

Risk assessment and planning are key components of individualised care for pregnant women, so that any factors likely to affect the pregnancy or birth can be identified in a timely manner. This guideline deals with care for women at higher risk of complications in labour and birth, either because of an existing medical condition or because obstetric complications develop. With appropriate risk assessment and care planning, care can be delivered to maximise the chances of good outcomes for both the woman and her baby. Assessment and planning start at the antenatal booking appointment and continue throughout pregnancy at each antenatal contact. During labour, routine monitoring of the woman and her unborn baby and of the progress of labour is a continuation of the risk-screening process. Findings from these assessments will affect the plan of care for labour, and may result in changes to the plan being made antenatally or during labour if new complications are identified.

A pregnancy is 'high risk' when the likelihood of an adverse outcome for the woman or the baby is greater than that of the 'normal population'. A labour is 'high risk' when the likelihood of an adverse outcome related to labour (for the woman or the baby) is greater than that of the 'normal population'.

The level of risk may be determined before pregnancy or arise during pregnancy or during labour, and can affect the woman or the baby:

- A woman may have an existing medical condition that can be made worse by physiological changes that occur in labour.
- Obstetric (pregnancy-related) problems can develop that increase the risk of adverse labour and/or birth outcomes.
- A woman can enter labour with no identified complications and be considered at low risk of complications, but problems may arise during labour that can be associated with adverse outcomes.

© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).

Finding more information and resources

To find out what NICE has said on topics related to this guideline, see our web page on intrapartum care.

ISBN: 978-1-4731-3296-2

Accreditation



© NICE 2019. All rights reserved. Subject to Notice of rights (https://www.nice.org.uk/terms-and-conditions#notice-of-rights).