

# Obstetric Guidelines

# 2017-19

The Bedside Clinical Guidelines Partnership  
in association with the

Staffordshire, Shropshire & Black Country  
Newborn and Maternity Network



and

Southern West Midlands  
Maternity and Newborn Network



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**Staffordshire, Shropshire & Black Country Newborn and Maternity Network** comprises:

The Dudley Group NHS Foundation Trust  
The Royal Wolverhampton NHS Trust  
The Shrewsbury and Telford Hospital NHS Trust  
University Hospitals of North Midlands NHS Trust  
Walsall Healthcare NHS Trust

**Southern West Midlands Maternity and Newborn Network** comprises:

Birmingham Women's NHS Foundation Trust  
Heart of England NHS Foundation Trust  
Sandwell and West Birmingham Hospitals NHS Trust  
Worcestershire Acute Hospitals NHS Trust  
Wye Valley NHS Trust  
Birmingham Children's Hospital NHS Foundation Trust

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The Shrewsbury and Telford Hospital NHS Trust  
University Hospitals of North Midlands NHS Trust  
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## COMMONLY USED ABBREVIATIONS • 1/3

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<b>A</b>		CVS	Chorionic villus sampling
AAGBI	Association of Anaesthetists of Great Britain and Ireland	CX	Cervix
ABG	Arterial blood gases	CXR	Chest X-ray
ACEI	Angiotensin-converting enzyme inhibitor	<b>D</b>	
AFE	Amniotic fluid embolism	DAS	Difficult Airway Society
AFP	Alpha-fetoprotein	DFM	Diminished fetal movements
ALS	Advanced life support	DIC	Disseminated intravascular coagulation
AN	Antenatal	DNA	Did not attend
ANC	Antenatal clinic	DoH	Department of Health
ANNP	Advanced neonatal nurse practitioner	DVT	Deep venous thrombosis
APH	Antepartum haemorrhage	<b>E</b>	
ARB	Angiotensin II receptor blockers	EAS	External anal sphincter
ARM	Artificial rupture of membranes	EBL	Estimated blood loss
<b>B</b>		ECG	Electrocardiography
BBA	Born before arrival	ECV	External cephalic version
BCG	Bacilli calmette-guerin	EDD	Expected date of delivery
BD	Twice daily (BIS Die)	EFM	Electronic fetal monitoring
BLS	Basic life support	EGC	Emergency gynaecology clinic
BMI	Body mass index	ELLSCS	Elective lower segment caesarean section
BO	Bowels opened	EMLSCS	Emergency lower segment caesarean section
BP	Blood pressure	EPU	Early pregnancy unit
BPM	Beats per minute	ERPC	Evaluation of retained products of conception
<b>C</b>		ETT	Endotracheal tube
CBD	Catheter bag drainage	<b>F</b>	
Ceph	Cephalic	FBC	Full blood count
CESDI	Confidential enquiry into stillbirths and deaths in infancy	FBS	Fetal blood sampling
CMACE	Centre for Maternal and Child Enquiries	FHR	Fetal heart rate
CEMACH	See CMACE	FSE	Fetal scalp electrode
CMW	Community midwife	<b>G</b>	
CPR	Cardio-pulmonary resuscitation	GBS	Group B <i>streptococcus</i>
CRP	C reactive protein	GCS	Glasgow coma scale
CS	Caesarean section	G	Gravida
CSU	Catheter specimen of urine	GTN	Glycerol trinitrate
CVA	Cerebrovascular accident	GTT	Glucose tolerance test
CVP	Central venous pressure		

## COMMONLY USED ABBREVIATIONS • 2/3

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### H

Hb	Haemoglobin
HBIG	Hepatitis B immunoglobulin
HBV	Hepatitis B virus
Hcg	Human chorionic gonadotrophin
HCV	Hepatitis C virus
HDC	High dependency care
HDU	High dependency unit
HELLP	Haemolysis, elevated liver enzymes and low platelet count
H/O	History of
HVS	High vaginal swab

### I

IAP	Intrapartum antibiotic prophylaxis
IAS	Internal anal sphincter
ICS	Intra-operative cell salvage
INR	International normalised ratio
IOL	Induction of labour
IPPV	Intermittent positive pressure ventilation
ITP	Idiopathic thrombocytopenic purpura
IUD	Intrauterine death
IUGR	Intrauterine growth restriction
IUT	Intrauterine transfer
IV	Intravenous
IVI	Intravenous infusion

### J

JVP	Jugular venous pressure
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### L

LFT	Liver function tests
LGA	Large for gestational age
LMA	Laryngeal mask airway
LMP	Last menstrual period
LMWH	Low molecular weight heparin
LSCS	Lower segment caesarean section
LVS	Low vaginal swab

### M

MAC	Minimum alveolar concentration
MAP	Mean arterial pressure
MAU	Maternal assessment unit
MBC	Midwife birth centre
MEOWS	See MEWS
MEWS	Maternity Early Warning Scoring
MgSO <sub>4</sub>	Magnesium sulphate
MROP	Manual removal of placenta
MSSU	Midstream sample of urine

### N

NAD	No abnormality detected
NEWS	Neonatal early warning score
NICE	National Institute for Health and Care Excellence
NICU	Neonatal intensive care unit
NIPE	Neonatal and infant physical examination
NLS	Neonatal life support
NNU	Neonatal unit

### O

OAA	Obstetric Anaesthetists' Association
OASIS	Obstetric anal sphincter injuries
ODP	Operating department practitioner
OGTT	Oral glucose tolerance test

### P

P	Parity
PCEA	Patient-controlled epidural anaesthesia
PE	Pulmonary embolism
PEA	Pulseless electrical activity
PET	Pre-eclamptic toxæmia
PIH	Pregnancy induced hypertension
PM	Post mortem
PN	Postnatal
PPH	Postpartum haemorrhage
PR	Per rectum
PROM	Pre-labour rupture of membranes
PV	Per vagina

## COMMONLY USED ABBREVIATIONS • 3/3

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<b>Q</b>		<b>V</b>	
QDS	Four times daily	VBAC	Vaginal birth after caesarean section
<b>R</b>		VE	Vaginal examination
RCM	Royal College of Midwives	VF	Ventricular fibrillation
RCOG	Royal College of Obstetricians and Gynaecologists	VIP	Visual infusion phlebitis
RCT	Randomised controlled trial	VTE	Venous thromboembolism
Rh	Rhesus	vWD	von Willebrand disease
RM	Registered midwife		
RTC	Road traffic collision		
<b>S</b>			
SAD	Supraglottic airway device		
SGA	Small for gestational age		
SNRI	Serotonin norepinephrine reuptake inhibitor		
SROM	Spontaneous rupture of membranes		
SSRI	Selective serotonin reuptake inhibitor		
ST	Specialist trainee		
SVD	Spontaneous vaginal delivery		
<b>T</b>			
TAP	Transversus abdominis plane		
TEDS	Thromboembolic deterrent stockings		
TENS	transcutaneous electrical nerve stimulation		
TIVA	Total intravenous anaesthesia		
TOP	Termination of pregnancy		
<b>U</b>			
U&E	Urea and electrolytes		
UKOSS	UK Obstetric Surveillance Survey		
USS	Ultrasound scan		
UTI	Urinary tract infection		

This is the fourth edition of the Obstetric guidelines. It has been compiled as an aide-memoire for all staff concerned with obstetric management, towards a more uniform standard of care across the Staffordshire, Shropshire & Black Country and Southern West Midlands Newborn and Maternity Networks' hospitals.

The Staffordshire, Shropshire & Black Country and Southern West Midlands Newborn and Maternity Networks and the Bedside Clinical Guidelines Partnership have provided the logistical, financial and editorial expertise to produce these guidelines.

These guidelines have been drafted with reference to published medical literature and amended after extensive consultation. Wherever possible, the recommendations made are evidence based. Where no clear evidence has been identified from published literature the advice given represents a consensus of the expert authors and their peers and is based on their practical experience.

No guideline will apply to every patient, even where the diagnosis is clear-cut; there will always be exceptions. These guidelines are not intended as a substitute for logical thought and must be tempered by clinical judgement in the individual patient and advice from senior colleagues.

***The guidelines are advisory, NOT mandatory***

### **The following guidelines are new to this edition:**

- Mental health in pregnancy
- Cell salvage
- Electronic fetal monitoring (EFM) – Antenatal
- Remifentanyl patient controlled analgesia (PCA) use in labour

If there are any guidelines you would like to see in the next edition, please submit as soon as possible for editorial comment. The deadline for suggestions for revisions or new guidelines to be included will be November 2017

### **Supporting information**

Where supporting evidence has been identified it is graded 1 to 5 according to standard criteria of validity and methodological quality as detailed in the table below. A summary of the evidence supporting each statement is available, with the original sources referenced. The evidence summaries are being developed on a rolling programme which will be updated as each guideline is reviewed.

Level	Treatment benefits	Treatment harms	Prognosis	Diagnosis
1	Systematic review of randomized trials or n-of-1 trials	Systematic review of randomized trials, systematic review of nested case-control studies, n-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Systematic review of inception cohort studies	Systematic review of cross sectional studies with consistently applied reference standard and blinding
2	Randomized trial or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Inception cohort studies	Individual cross sectional studies with consistently applied reference standard and blinding
3	Non-randomized controlled cohort/follow-up study	Non-randomized controlled cohort/follow-up study provided there are sufficient numbers to rule out a common harm	Cohort study or control arm of randomized trial	Non-consecutive studies, or studies without consistently applied reference standards
4	Case-series, case-control studies, or historically controlled studies	Case-series, case-control, or historically controlled studies	Case-series or case-control studies, or poor quality prognostic cohort study	Case-control studies, or poor or non-independent reference standard
5	Mechanism-based reasoning	Mechanism-based reasoning	n/a	Mechanism-based reasoning

Excerpt from: OCEBM Levels of Evidence Working Group. The Oxford Levels of Evidence 2. Oxford Centre for Evidence-Based Medicine. 2011. <http://www.cebm.net/index.aspx?o=5653>

Evaluation of the evidence-base of these guidelines involves review of existing literature then periodical review of anything else that has been published since last review. The editors encourage you to challenge the evidence provided. If you know of evidence that contradicts, or additional evidence in support of, the advice given in these guidelines please forward it to the Clinical Guidelines Developer/Co-ordinator on [bedsideclinicalguidelines@uhnm.nhs.uk](mailto:bedsideclinicalguidelines@uhnm.nhs.uk)

### **Feedback and new guidelines**

The editors acknowledge the time and trouble taken by numerous colleagues in the drafting and amending of the text. The accuracy of the detailed advice given has been subject to exhaustive checks. However, any errors or omissions that become apparent should be drawn to the notice of the editors, via the Clinical Guidelines Developer/Co-ordinator ([bedsideclinicalguidelines@uhnm.nhs.uk](mailto:bedsideclinicalguidelines@uhnm.nhs.uk)), so that these can be amended in the next review, or, if necessary, be brought to the urgent attention of users. Constructive comments or suggestions would also be welcome.

Effective communication is essential for delivery of high quality, safe care

### COMMUNICATION

- Ensure information given to woman is presented in a way she can understand
- Maintain effective and appropriate communication with your colleagues
- Maintain knowledge and develop your abilities in team-based communication, keeping in mind the reliance placed on your communication and recording of information

### DOCUMENTATION

- Record all discussions and actions relating to woman's care, including discussions where she has not been directly involved
- Ensure all entries in healthcare records are clear, accurate, legible and contemporaneous and attributed to a named person with an identifiable role
- Do not include:
  - unnecessary abbreviations or jargon
  - meaningless phrases
  - irrelevant or offensive speculation
  - irrelevant personal opinions regarding the woman
- Ensure any justifiable alteration to your own or other healthcare professional's documentation is clearly attributed to a named person with an identifiable role. Original entry and alteration must be clear, legible and auditable
- Healthcare record must include details of assessments, reviews, treatment and evidence of arrangements for future and continuing care, including information given to woman





# GUIDELINES

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**These guidelines are advisory, NOT mandatory**

## INTRODUCTION

- In normal pregnancy, maternal plasma volume increases by up to 50%, red cell mass gradually increases by approximately 20% and haemoglobin (Hb) concentration drops. This normal physiological response may resemble iron deficiency anaemia
- Do not give routine iron and folic acid supplementation until anaemia diagnosed (using pregnant ranges)

## DEFINITION

**Hb <110 g/L in the first trimester and <105 g/L in the second and third trimesters; is associated with:**

- Low-birth-weight and preterm labour
- Poor fetal outcome
- Surgical complications and perioperative morbidity in mother
- Amount of iron baby will store during breastfeeding
- Neurological development and brain function

*Consider most suitable place of birth for women who are anaemic in labour and take appropriate precautions to reduce or manage blood loss*

## RISK FACTORS

- Women with malabsorption syndrome, haemoglobinopathy, epilepsy requiring anticonvulsants and multiple pregnancies are at increased risk of folate deficiency
- offer iron and folic acid supplementation
- Other groups may have an increased risk based on dietary or cultural factors. Assess on an individual basis

## Causes of anaemia in pregnancy

- Iron deficiency
- Folic acid deficiency

- Vitamin B<sub>12</sub> deficiency
- Hb variants
- Other causes
  - exclude chronic illness [e.g. recurrent urinary tract infection (UTI), chronic inflammatory bowel disease]
  - women born outside the UK or with a history of foreign travel
  - consider less common causes (e.g. chronic infections and parasitic infections)

## Symptoms and signs

- Pallor
- Lethargy
- Shortness of breath
- Weight loss
- Depression
- Nausea
- Vomiting
- Gingivitis
- Diarrhoea
- Tachycardia
- Thready pulse

## DIAGNOSING IRON DEFICIENCY ANAEMIA

- Screen for anaemia at booking and 28 weeks' gestation unless otherwise indicated
- Offer screening to women identified for haemoglobinopathies (i.e. sickle cell and thalassaemia) following completion of the Family Origin Questionnaire (FOQ) at booking
- Diagnose iron deficiency anaemia if mean corpuscular volume (MCV) <80 fl
- Check serum ferritin, serum iron and total iron binding capacity (TIBC) saturation. Iron deficiency indicated by:
  - ferritin level of <15 micrograms/L
  - serum iron level of <12 micromoles/L
  - TIBC saturation of <15%

### TREATMENT

#### Advice to women with anaemia

#### Life-style

- Avoid alcohol
- Stop smoking

#### Dietary advice

- Animal protein – well cooked red meat (avoid pre-cooked chilled meat, and liver)
- Eggs
- Milk
- Increase vitamin C to aid iron absorption (fresh orange juice, citrus fruits)
- Leafy green vegetables (not over-cooked)
- If concerns regarding compliance with dietary advice, give vitamin C as ascorbic acid 50 mg/day

### TREATMENT OF IRON DEFICIENCY ANAEMIA

#### Aim of treatment

- Hb should rise by 20 g/L over 3–4 weeks

#### Elemental iron

- Give up to 100–200 mg elemental iron using 1 of the following preparations:
  - ferrous sulphate 200 mg 8–12 hrlly (contains 65 mg elemental iron per 200 mg tablet)
  - ferrous fumarate tablet 210 mg 8–12-hrly (contains 65–70 mg elemental iron per 210 mg tablet) or oral solution 10 mL/280 mg 12-hrly (contains 90 mg elemental iron per 10 mL/280 mg)
  - sodium ferredetate 10 mL 8-hrly (contains 27.5 mg elemental iron per 5 mL dose)
- If these products are not tolerated, seek pharmacy advice

- Counsel woman to take oral iron supplements correctly
  - on an empty stomach
  - 1 hr before meals
  - with a source of vitamin C (ascorbic acid) e.g. orange juice/meat
  - avoid taking tablets with tea/eggs/coffee/milk – may reduce absorption
  - other medications/antacids should not be taken at the same time

#### Side effects

- Advise woman that iron supplements may cause:
  - gastrointestinal upset with nausea and epigastric pain
- Where there is a history of constipation, use osmotic laxative

#### Monitoring

- Check Hb 4 weeks after starting therapy
- an increase of 8 g/L/week is usual irrespective of the route of iron administration

#### Response to treatment

- Check compliance
- If not tolerant, try alternative preparations
- If inadequate response (<32 g/L)
  - check iron studies, B<sub>12</sub> and folate levels and refer to named consultant's antenatal clinic for next available appointment where IV iron therapy will be considered – see **Flowchart**
- In consultation with a haematologist, consider erythropoietin

### MACROCYTIC ANAEMIA

#### Definition

- Hb value and red cell numbers are reduced but MCV is increased
- In pregnancy an MCV >96 fl is regarded as abnormal

### Treatment

- Check levels of folate in blood and red blood cells and B<sub>12</sub> levels in first instance
- If folate deficiency diagnosed, start folic acid 5 mg/day. Iron supplementation may also be necessary
- If B<sub>12</sub> deficiency diagnosed, refer to GP or hospital antenatal clinic
- If both B<sub>12</sub> and iron supplementation required, start B<sub>12</sub> treatment first
- If folate and B<sub>12</sub> levels are normal, refer to consultant antenatal clinic who will consider referral to haematology

### Advice to woman

#### Lifestyle

- Avoid alcohol
- Stop smoking

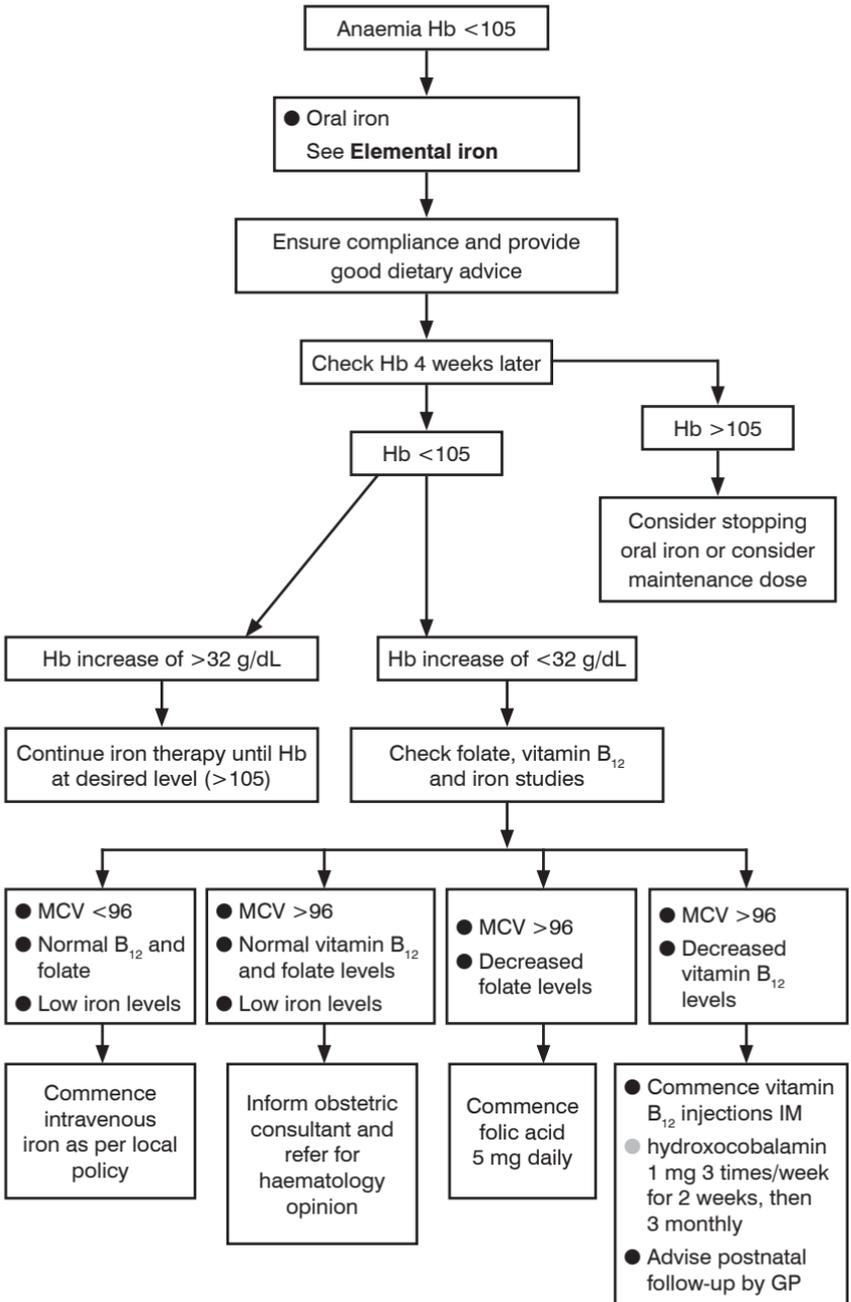
#### Diet

- Folic rich foods:
  - leafy green vegetables (over boiling will destroy folic acid)
  - chickpeas
  - bananas
  - citrus fruit
  - avocado
  - mushrooms
  - asparagus
  - bread and cereals fortified with folic acid

### B<sub>12</sub> deficiency known or diagnosed

- Eat animal protein – fresh well-cooked meat (avoid pre-cooked chilled meat)
- Well-cooked eggs
- Milk
- Cheese (avoid soft runny cheeses e.g. Brie)
- Give vitamin B<sub>12</sub> injections (hydroxocobalamin) 1 mg IM 3 times/week for 2 weeks, then 1 mg every 3 months according to response
- Take weekly red cell counts and Hb estimations until a maintenance dose is reached
- Iron supplementation is prescribed as before in addition to vitamin B<sub>12</sub> as rapid response to regeneration of red blood cells may deplete iron stores – see **Flowchart**

**Process pathway – management of anaemia in pregnancy**



# ANTEPARTUM HAEMORRHAGE (APH) (including placental abruption) • 1/4

## DEFINITION

- Bleeding from the genital tract >24 weeks of pregnancy and before birth
- spotting/streaking
- minor: <50 mL
- major: 50–1000 mL
- massive: >1000 mL/compromise

## INITIAL MANAGEMENT

- Admit to maternity unit
- Immediately assess severity of haemorrhage and whether immediate treatment required
- If maternal shock, marked abdominal pain or tenderness, or fetal heart-rate abnormalities, see **Major APH or abruption** below
- Inform junior doctor and/or middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) who will review and formulate care plan
- Obtain detailed history from woman or those accompanying her
- Assess colour and amount of vaginal blood loss to determine whether fresh or stale, moderate or major bleed

## Examination

- Full antenatal examination (in accordance with local Trust admission policy). Include:
  - fundal height
  - lie, presentation and fifths palpable of presenting part. A high presenting part/abnormal lie can indicate placenta praevia
  - examine abdomen for tenderness/tenseness/location of pain
- Perform vaginal speculum examination, except when known major placenta praevia
- Assess cervix dilatation and appearance
- Take triple swabs, including chlamydia
- Refer to ultrasound scan to determine location of placenta

***If placenta low lying, do NOT perform digital vaginal examination to avoid accidental trauma to placenta and possible severe haemorrhage***

- Auscultate fetal heartbeat to determine presence
- Perform electronic fetal monitoring (EFM) to assess fetal wellbeing – see **Electronic fetal monitoring** – Antenatal guideline
- Consider maternal corticosteroids to facilitate fetal lung maturity <34<sup>+6</sup> weeks' gestation

***If minor APH progresses to major, delivery indicated***

## Monitor

- Start Maternity Early Warning Scoring (MEWS) chart

## Investigation

- Take bloods for:
  - FBC
  - group and save and crossmatch if significant bleed
  - consider coagulation studies
  - in Rhesus negative women, perform Kleihauer test to quantify the degree of any fetomaternal haemorrhage and determine dose of anti-D required. It is of little value in diagnosing abruption

***For Rh negative women, obstetrician will prescribe anti-D immunoglobulin***

## MAJOR APH OR ABRUPTION

### Presenting symptoms

- Maternal shock
- Marked abdominal pain or tenderness
- Fetal heart-rate abnormalities
- Bleeding may be concealed or visible

# ANTEPARTUM HAEMORRHAGE (APH) (including placental abruption) • 2/4

## MANAGEMENT

*This is an obstetric emergency*

- Activate emergency buzzer and request assistance from:
  - delivery suite team leader
  - middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) and junior doctor
  - on-call obstetric anaesthetist and anaesthetic nurse or operating department practitioner
- Notify consultant obstetrician and consultant anaesthetist
- Team leader will delegate management tasks and nominate a team member to document events

## Resuscitation

- Manage and maintain – Airway, Breathing, Circulation
- Record vital signs every 5 min (include MEWS)
- Avoid aortocaval compression
- Give high flow oxygen

## Replace blood volume loss

- Insert 2 large bore (14 or 16 gauge) IV cannulae
- Take blood for:
  - crossmatch
  - FBC
  - clotting screen and fibrinogen
- Request blood and blood products urgently according to Trust Major haemorrhage protocol
- While awaiting blood, infuse compound sodium lactate (Hartmann's) solution or sodium chloride 0.9% and colloid
- If blood loss life-threatening un-crossmatched O Rhesus-negative blood or group-specific blood (if available) may be used from delivery suite blood refrigerator
- Insert indwelling urinary catheter

*When infusing large amounts of intravenous fluids rapidly, infuse via blood warmer*

## Analgesia

- Dosage and administration according to severity of pain. Opiates may be required for placental abruption

## Monitor

- Pulse
- BP
- Respiratory rate
- Oxygen saturation
- Renal function: monitor urine output hourly
  - report volume <30 mL/hr to attending obstetric and anaesthetic staff
- Temperature
- Fetal heart by EFM
  - if no signs of fetal heart rate – ultrasound scan to confirm/rule out intrauterine death

## Caesarean section

- If fetal heart rate present and maternal condition stable, transfer to theatre for emergency caesarean section
- Set up cell saver if used locally
- Inform neonatologist and request attendance at delivery

## Intrauterine death

- Inform consultant obstetrician and discuss plan of care with woman, considering severity of haemorrhage and maternal condition
- The longer the fetus stays in-utero, the higher the risk of disseminated intravascular coagulation (DIC)

*Expect and be prepared for massive postpartum haemorrhage (PPH) whether delivered vaginally or by lower segment caesarean section (LSCS) – see Postpartum haemorrhage guideline*

# ANTEPARTUM HAEMORRHAGE (APH) (including placental abruption) • 3/4

- Central venous pressure (CVP) line/arterial line may be inserted by anaesthetic team to monitor fluid balance and aid resuscitation
- In coagulopathy or massive transfusion, seek advice from consultant haematologist, who will arrange blood and blood products and correct clotting factor deficiencies

## Post-operative/ post-delivery care

- Transfer woman to delivery suite high dependency area
- If ventilation necessary, transfer to acute Trust ITU – see **Maternal transfer** guideline

## PLACENTA PRAEVIA

### Definition

- Placenta wholly or partially inserted in lower segment of uterus

### Major or complete

- Placenta encroaching on cervical opening (determined by ultrasound scan)
- deliver by caesarean section

### Minor or partial

- Placenta not encroaching on cervical opening

### Management of bleeding

- Woman to remain on delivery suite
- Crossmatch minimum of 2 units of blood to delivery suite blood bank urgently

### Conservative management

- Administer corticosteroids (if indicated) to assist fetal lung maturity
- In a significant bleed, on-call consultant obstetrician will discuss plan of care for conservative management or delivery with mother and document in maternal healthcare record

## Caesarean section

- With significant bleeding, consultant obstetrician will deliver by caesarean section or directly supervise a middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Crossmatch 4 units of blood and have ready in delivery suite blood bank, preferably before delivery achieved or, if available, group-specific blood
- Obtain informed consent
- Discuss possibility of hysterectomy
- Set up cell saver if used locally

**Women with a previous caesarean section and anterior placenta praevia are at high risk of placenta accreta and should be managed by consultant obstetrician and anaesthetist**

## Choice of anaesthesia

- Decided by anaesthetist and woman – usually spinal but, in haemodynamically unstable woman, general anaesthesia may be indicated

## Post-operative infusion

- Commence oxytocin infusion as per local practice

## PLACENTA ABRUPTION

### Definition

- Accidental haemorrhage due to partial or complete separation of normally situated placenta
- Bleeding may be concealed or visible

### Risk factors

- Trauma
- Hypertensive disease or pre-eclampsia
- Previous abruption
- High parity
- Twin gestation
- Polyhydramnios
- Smoking
- Prolonged rupture of membranes

## ANTEPARTUM HAEMORRHAGE (APH) (including placental abruption) • 4/4

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### Management

#### *Dependent on severity of bleed*

- If minor APH, midwife will monitor:
  - amount of vaginal blood loss
  - abdominal tenderness
  - pain
  - vital signs
- If active bleeding, monitor fetus with continuous EFM

### Conservative management

- Administer corticosteroids (if indicated) to assist fetal lung maturity
- If bleeding continues, consultant obstetrician/middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) will consider delivery, possibly by induction

### EXTRAPLACENTAL BLEEDING

- Coagulation defects (e.g. von Willebrand's disease), cervical polyps, cervical ectropion, cervical infection, cervical carcinoma, ruptured vulval varices and infection

### BACKGROUND

- Childbirth has the potential to cause long-term damage to the pelvic floor, affecting bladder or bowel function
- Most women have the urge to void  $\leq 6$  hr postpartum
- 10–15% of women experience voiding dysfunction to some degree and for some time following delivery
- 5% have significant and longer lasting dysfunction
- this may lead to bladder over-distension and overflow incontinence with long-term significant bladder dysfunction

### BLADDER DYSFUNCTION

#### Women at highest risk

- Primigravida
- Prolonged labour, especially prolonged second stage
- Epidural for labour and delivery
- Frequent catheterisation during labour
- Assisted vaginal delivery
- Caesarean section
- Perineal injury
- Big baby  $> 4.5$  kg
- Previous bladder problems (required individualised management plan for labour and puerperium)

#### Symptoms and signs

- Frequency/urgency/lower abdominal pain
- Prolonged voiding
- No sensation to void or inability to void
- Palpable bladder
- Overflow incontinence

### ANTENATAL CARE

#### First antenatal visit

- Ask woman if she has ever experienced problems with bowel or bladder function. This can result in early detection of bladder/bowel dysfunction

- document response in medical history section of maternal healthcare record
- if problem highlighted, refer to appropriate healthcare professional (e.g. physiotherapist, urotherapist or consultant obstetrician) for plan of action
- Ensure MSSU sent to rule out UTI
- Discuss:
  - pelvic floor and urethral sphincter exercise
  - diet to prevent constipation

#### Third trimester antenatal visit

- It is good practice to ask again if woman has ever experienced problems with bowel or bladder function. Women are often reluctant to disclose symptoms

### MANAGEMENT IN LABOUR

#### First stage

- Encourage 2–4 hrly voiding; ensure good void is documented
- threshold for catheterisation (in/out) should be low if woman unable to void on 2 occasions ( $> 4$  hr) or maternal bladder is palpable. If third catheterisation is required, insert an indwelling catheter (IDC)
- if any void measures  $> 500$  mL, bladder should be emptied more frequently to prevent over-distention
- Maintain adequate hydration during labour
- Urinalysis with dipstick every void and document in partogram

#### Second stage

#### **A full bladder may hinder descent of presenting part**

- Ensure bladder is empty. If necessary, catheterise
- Bladder must be empty before instrumental delivery
- consider use of in/out catheter or if IDC already *in situ* deflate balloon

### POSTNATAL ADVICE/ DISCUSSION

- Ask again if woman has ever experienced problems with bowel/bladder function
- Document response in appropriate section of maternal healthcare record
- If problem highlighted, document in management plan and refer to appropriate healthcare professional (e.g. physiotherapy, urotherapist)
- Provide advice on:
  - diet and fluids
  - importance of avoiding constipation
  - pelvic floor exercises
  - simple analgesia

### POSTNATAL MANAGEMENT

***Most women will experience supra pubic discomfort as their bladder distends but lack of this sensation does not mean the bladder is not full***

- Encourage woman to void before leaving delivery suite or departing the home if homebirth
- Palpate abdomen for signs of palpable bladder, or deviation of uterus which may indicate urinary retention
- Record time and volume of first void in maternal healthcare record
  - if volume  $\geq$  150–200 mL (volume dependent on local guidance), and woman experiences no difficulty in micturation or any other urinary symptoms, cease recording
  - if volume  $<$  150–200 mL (volume dependent on local guidance), see **Voiding small amounts of urine** below
- If clinical suspicion of dehydration, encourage fluids
- If no dehydration and retention suspected, do not encourage fluids as this can exacerbate retention. Seek advice from junior doctor and/or middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- establish when woman last passed urine in labour

### Voiding small amounts of urine

- If woman continues to void small volumes of urine ( $<$  150 mL) 6 hr post-delivery, insert size 12 Foley catheter or perform a bladder scan if available
- Measure residual urine volume
  - if 200 mL, leave catheter in place freely draining for 24 hr and start fluid balance chart
  - if  $<$  150 mL, encourage increased fluid intake
  - record amount of urine passed
  - inform obstetric middle grade (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Remove catheter after 24 hr and, if infection suspected, send catheter specimen of urine (CSU) for analysis
- rapid diuresis may occur and will depend on how much fluid has been consumed or infused
- measure next 2 voids. If  $\geq$  150–200 mL (volume dependent on local guidance), discharge woman
- Repeat question – has woman ever experienced problems with bowel or bladder function
- document response in appropriate section of maternal healthcare record and management plan

***If catheterisation required, discuss transfer to consultant-led unit with woman and consultant***

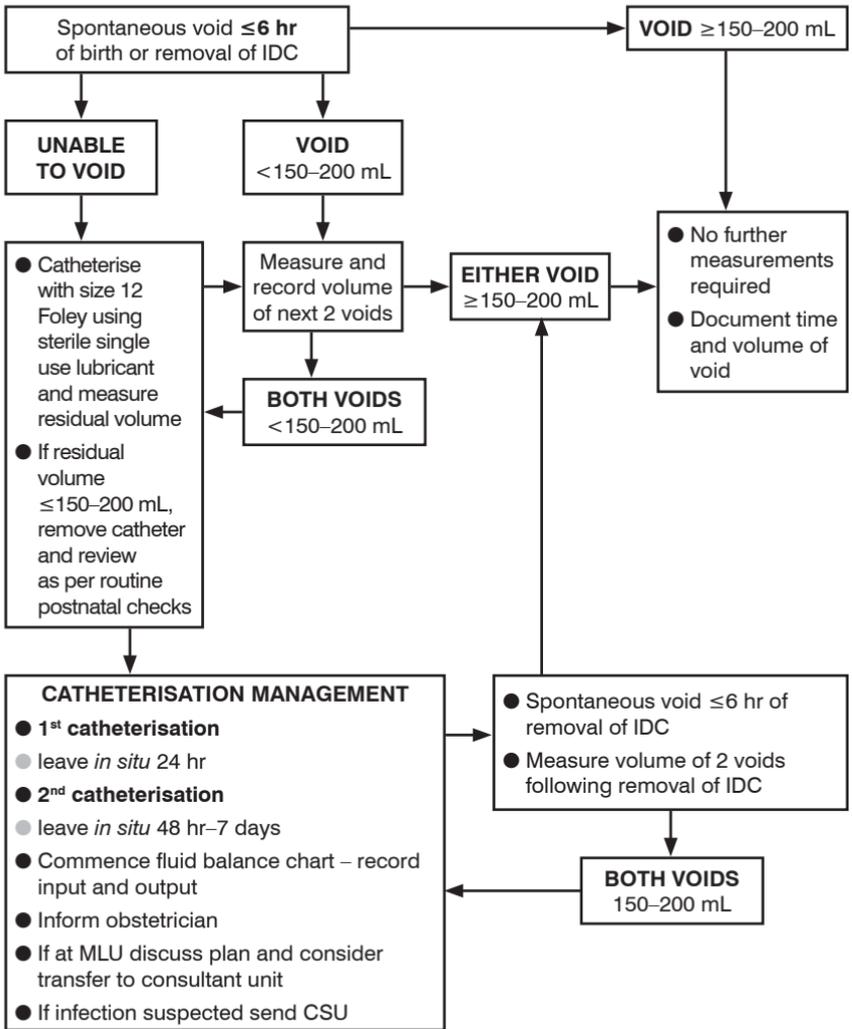
**After removal of indwelling catheter for voiding problems**

- If still unable to void or continuing to void small volumes after catheter removal, inform consultant obstetrician
- Measure residual urine volume or, if available, use bladder volume screening
  - if <150 mL, consider repeating residual volume measurement in 12 hr
  - if >300 mL, replace IDC for  $\geq 48$  hr and, more commonly, 7 days
  - if between 150–300 mL, discuss with woman and agree course of action, depending on her individual circumstances (e.g. repeat residual volume measurement after next void or insert catheter)
- Discuss management plan with woman and document in maternal healthcare record
- Arrange follow-up at 6 weeks postpartum e.g. in pelvic floor clinic (depending on local policy)

**If not voided 4 hr after birth or removal of IDC:**

- Abdominal palpation
- Assess for signs of palpable bladder/ deviated uterus
- Inspect perineum
- Offer analgesia
- Allow privacy and time
- Encourage fluids if clinically dehydrated

**Flowchart: Postnatal bladder care management**



## INTRODUCTION

Caesarean section can be life-saving or can prevent serious morbidity to mother and fetus

## CLASSIFICATION AND TIMING OF CAESAREAN SECTION

- Use classification below to communicate degree of urgency to all staff and ensure caesarean section is undertaken within an acceptable timeframe
- Prepare for a caesarean section to minimise risks of procedure and optimise mother's and her birth partner's experience. The shorter the decision to delivery interval the less optimal the preparation

Category	Definition	Standard
1 – Crash	Immediate threat to life of woman and fetus	Interval between decision to delivery time should be $\leq 30$ min
2 – Urgent	Maternal or fetal compromise not immediately life-threatening	Interval between decision to delivery time according to local practice
3 – Scheduled	Early delivery necessary – no maternal or fetal compromise	Interval between decision to delivery time according to local practice
4 – Elective	No maternal or fetal compromise	Undertaken at a time to suit both woman and obstetric team

### CATEGORY 1 CAESAREAN SECTION

#### Preparation

- Middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) decides if caesarean section indicated
- consultant obstetrician involved in making decision unless doing so would be life-threatening to the woman or fetus
- Follow local practice to summon theatre team and inform category 1 caesarean section
- Transfer to theatre immediately
- Provide woman with as much information as possible and obtain consent
- verbal consent is acceptable in cases of extreme emergency
- Ensure blood taken for the following and deliver to laboratory urgently:
  - FBC
  - group and save

#### Documentation

- Person making decision for caesarean section documents the following in intrapartum care record:
  - indication and classification of emergency caesarean section
  - time decision for caesarean section made
  - any reason for a delay in performing caesarean section
- Complete the WHO theatre check list

#### Midwife

- Remove woman's jewellery or cover under adhesive tape
- Remove woman's nail polish
- If oxytocin infusion in progress, switch off
- Ensure patient identification (e.g. band) attached according to local practice

### Anaesthetist

- Pre-assesses woman (may be continued en-route to and/or in theatre)
- Establish IV access 16 G cannula (if not already done)
- Give antacid treatment as per local policy

### Theatre team

- Prepares theatre

### In theatre

#### **Anaesthetist, theatre team and midwife**

- Place woman in left lateral tilt on operating table; commence oxygen
- Maternal monitoring – BP, ECG, oximetry
- Regional or general anaesthesia administered
- Administer prophylactic antibiotics as per local guidance
- Catheterise woman
- Check resuscitaire and emergency neonatal resuscitation equipment
- Neonatologist or advanced neonatal practitioner (ANNP) trained in resuscitation of the newborn to be present at:
  - all category 1 and 2 emergency caesarean section
  - caesarean section when general anaesthesia used
- When performing caesarean section with a deeply impacted head (at level of/below ischial spines):
  - a more experienced obstetrician may be required
  - consider use of fetal pillow if available locally
- Obtain paired cord gases – see **Umbilical cord sampling** guideline or follow local practice

### CATEGORY 2, 3 AND 4 CAESAREAN SECTION

#### Preparation

- There is more time for preparation e.g:
  - more detailed explanation to woman and written consent
  - dressing woman in hospital gown, hat to cover long hair
  - fetal heart monitoring
  - administer antacids (e.g. ranitidine) as per local policy
- Complete WHO checklist

#### Obstetrician

- Provides detailed information to woman and obtains written consent
- Documents indication for caesarean section in intrapartum maternal healthcare record
- Prescribes antacids (e.g. ranitidine) as per local policy
- Commences caesarean section audit form (if local practice)

#### Anaesthetist

- Pre-assesses woman

#### Midwife

- Review woman's birth plan
- If not already arranged, ensure a midwife is allocated to care for the woman
- Midwife ensures:
  - continuous electronic fetal monitoring (category 2) until surgery begins
  - pre-operative check list completed
  - VTE thromboprophylaxis as per local policy
  - patient identification completed and *in situ*
  - blood for FBC and group and save
  - contact neonatal team if presence required

### FOLLOWING CAESAREAN SECTION

- See **Recovery** guideline or local policy for enhanced recovery

#### Obstetrician

- Documents procedure in intrapartum maternal healthcare record according to local Trust procedure
- Complete caesarean section audit form (if local practice)

#### Anaesthetist

- Transfers woman to recovery room
- Ensures appropriate antibiotic prophylaxis/analgesia/thromboprophylaxis prescribed according to local policy
- Hands over to midwife/recovery nurse

#### Midwife/recovery nurse

- Recovery observations as per local practice
- Initiates skin-to-skin contact
- Completes appropriate documentation

### IMMEDIATE/24 HR POST-OPERATIVE CARE

- See **Routine postnatal care of women and babies** guideline and refer to local guidelines
- post anaesthetic care within the maternity unit
- postnatal care within the maternity unit
- Observations required
- Administer subcuticular LMWH
- Remove urinary catheter according to local practice
- see **Bladder care** guideline
- Wound dressing to remain undisturbed for 48 hr–5 days (dependent on local practice)
- women with BMI >40 (>35 with comorbidities) use a negative pressure wound dressing – left in place for 7 days (if local practice)

### Communication

- Obstetrician to discuss procedure with woman, offering advice about vaginal birth after caesarean section (VBAC)
- if local practice, give VBAC information leaflet

### Documentation

- Obstetric medical staff to document need for follow-up in maternal healthcare record

- Check equipment daily, and before resuscitation
- Follow Resuscitation Council UK Guidelines [www.resus.org.uk](http://www.resus.org.uk)

### DRY AND COVER

- Cord clamping – see **Cord clamping** below
- ≥28 weeks' gestation, dry baby, remove **wet towels** and cover baby with **dry towels**
- <28 weeks' gestation, do not dry body but place baby in plastic bag feet first, dry head only and put on hat

### Cord clamping

- If baby does not require immediate resuscitation, clamp cord after 1 min
- If immediate resuscitation is required following assessment, clamp cord as soon as possible

### ASSESS

- Assess **colour, tone, breathing and heart rate**

***If baby very floppy and heart rate slow, assist breathing immediately***

- Reassess every 30 sec throughout resuscitation process
- If help required, request **immediately**

***If baby not breathing adequately by 90 sec, assist breathing***

### CHECK AIRWAY

***For baby to breathe effectively, airway must be open***

- To open airway, place baby supine with head in '**neutral position**'
- If very floppy, give chin support or jaw thrust while maintaining the neutral position

## IMMEDIATE TREATMENT

### Airway

- Keep head in neutral position
- Use T-piece and soft round face mask, extending from nasal bridge to chin
- Give 5 inflation breaths, sustaining inflation pressure (**Table 1**) for 2–3 sec for each breath
- Give PEEP of 5 cm H<sub>2</sub>O
- Begin inflation breaths in air

**Table 1: Inflation pressure (avoid using pressure higher than recommended)**

Term baby	30 cm of water
Preterm baby	20–25 cm of water

### No chest movement

Ask yourself:

- Is head in neutral position?
- Is a jaw thrust required?
- Do you need a second person to help with airway to perform a jaw thrust?
- Is there an obstruction and do you need to look with a laryngoscope and suck with a large-bore device?
- Consider placing oro-pharyngeal (Guedel) airway under direct vision using laryngoscope
- Is inflation time long enough?
  - if no chest movement occurs after alternative airway procedures **above** have been tried (volume given is a function of time and pressure), a larger volume can be delivered if necessary by inflating for a longer time (3–4 sec)
- Attach saturation monitor to right hand – see **Saturation monitoring** for guidance on SpO<sub>2</sub> targets

**Endotracheal intubation**

**Indications**

- Severe hypoxia (e.g. terminal apnoea or fresh stillbirth)
- Stabilisation of airway
- Extreme prematurity
- Congenital diaphragmatic hernia

**Safe insertion of endotracheal tube requires skill and experience**

**If you cannot insert a tracheal tube within 30 sec, revert to mask ventilation**

**Capnography can help to assess endotracheal tube placement**

**Do not move onto ventilation breaths unless you have a heart rate response OR you have seen chest movement**

**Review assessment after inflation breaths**

- Is there a rise in heart rate?
- Is there chest movement with the breaths you are giving?
- If no spontaneous breathing, but chest movement has been obtained, perform 30 sec of **ventilation breaths**, given at a rate of 30 breaths/min (1 sec inspiration)

**Breathing**

- Most babies have a good heart rate after birth and establish breathing by 90 sec
- if not breathing adequately give **5 inflation breaths**, preferably using air at pressures in **Table 1**
- Heart rate should rapidly increase as oxygenated blood reaches heart

**Table 2: Outcome after 30 sec of ventilation breaths**

Heart rate	Breathing	Action
Increases	Not started breathing	<ul style="list-style-type: none"> <li>● Provide 30–40 breaths/min</li> <li>● Where available, use PEEP at 5 cm water with T-piece system</li> </ul>
<60	Obvious chest movement	<ul style="list-style-type: none"> <li>● Start chest compressions (see below)</li> </ul>

- If baby is floppy with slow heart rate and there is chest movement, start cardiac compressions with ventilation breaths immediately after inflation breaths
- Increase inspired oxygen concentration every 30 sec by 30% e.g. 30–60–90% depending on response – see **Saturation chart**

**Chest compression**

- Use if heart rate approximately <60 beats/min (do not try to count accurately as this will waste time)

***Start chest compression only after successful inflation of lungs***

Figure 1

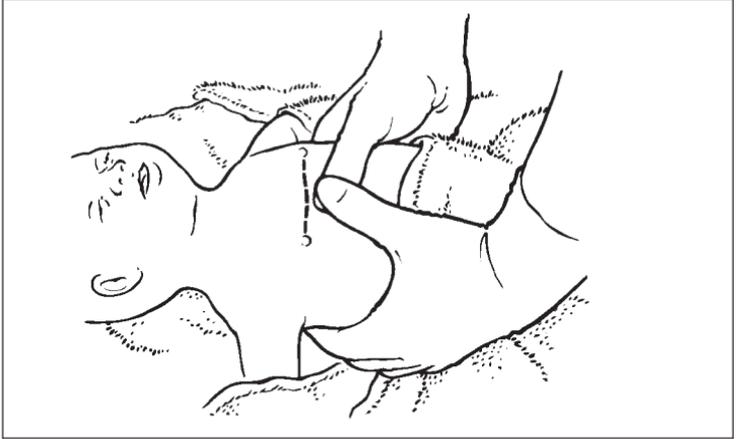
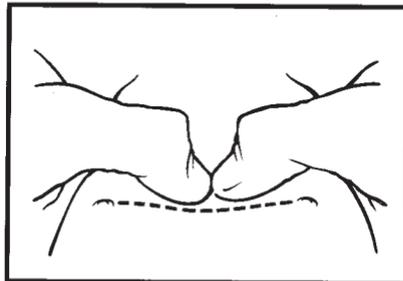
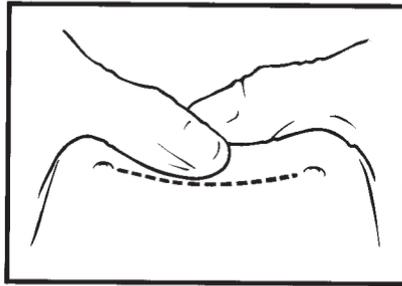


Figure 2



Pictures taken from NLS manual and Resuscitation Council (UK) and reproduced with their permission

**Ideal hold (Figure 1/Figure 2)**

- Circle chest with both hands so that thumbs can press on the sternum just below an imaginary line joining the nipples with fingers over baby's spine

**Alternative hold (less effective)**

- Compress lower sternum with fingers while supporting baby's back. The alternative hand position for cardiac compressions can be used when access to the umbilicus for UVC catheterisation is required, as hands around the chest may be awkward

**Action**

- Compress chest quickly and firmly to reduce the antero-posterior diameter of the chest by about one-third, followed by full re-expansion to allow ventricles to refill
- remember to relax grip during IPPV, and feel for chest movement during ventilation breaths, as it is easy to lose neutral position when cardiac compressions are started

*Co-ordinate compression and ventilation to avoid competition.*

*Aim for 3:1 ratio of compressions to ventilations and 90 compressions and 30 breaths (120 'events') per min*

**Blood**

- If there is evidence of fetal haemorrhage, consider giving O negative emergency blood

**Resuscitation drugs**

- Always ask about drugs taken recently by, or given to mother
- Give drugs only if there is an undetectable or slow heartbeat despite effective lung inflation and effective chest compression
- Umbilical venous catheter (UVC) is the preferred route for urgent venous access

- Recommence cardiac compressions and ventilation breaths ratio 3:1 after each drug administration and re-assess after 30 sec

- If no heart rate increase, progress to next drug

**Adrenaline 1:10,000**

- 10 microgram/kg (0.1 mL/kg) IV
- If this dose is not effective, give 30 microgram/kg (0.3 mL/kg) after sodium bicarbonate has been given
- Adrenaline should only be given via the ET tube (ETT) if venous access is taking time to achieve; it should not delay intravenous access and treatment; the dose is 0.5–1.0 mL/kg of 1:10,000

**Sodium bicarbonate 4.2%**

- 1–2 mmol/kg (2–4 mL/kg) IV (never give via ETT)

**Glucose 10%**

- 2.5 mL/kg IV slowly over 5 min

**Sodium chloride 0.9%**

- 10 mL/kg IV

**Naloxone**

- Give only after ventilation by mask or ETT has been established with chest movement seen and heart rate >100 beats/min
- If mother has been given pethidine within 2–4 hr of delivery, give IM naloxone:
  - 100 microgram (0.25 mL) for small preterm babies
  - 200 microgram (0.5 mL) for all other babies

**WHEN TO STOP**

- If no sign of life after 10 min, outlook is poor with few survivors, majority will have cerebral palsy and learning difficulties
- If no sustained spontaneous breathing 30 min after a heart rate has been established, majority also have poor prognosis

**Continue resuscitation until a senior neonatologist advises stopping**

**MONITORING**

**Saturation monitoring**

- Oxygen monitoring is activated when paediatrician/2<sup>nd</sup> pair of hands arrives. In the meantime, the person initiating resuscitation carries out all the usual steps in resuscitation
- Do not stop resuscitation for a saturation probe to be attached
- Attach saturation probe to the right hand and connect to the monitor once 5 inflation breaths have been given
- SpO<sub>2</sub> should spontaneously improve as **Table 3**

**Table 3**

Time (min)	Acceptable pre-ductal SpO <sub>2</sub> (%)
2	60
3	70
4	80
5	85
10	90

**Air to oxygen**

- If inflation breaths produce a response and SpO<sub>2</sub> monitoring is available with a reliable trace target, saturations as in **Table 3**

- If inflation breaths have been successful and chest movement seen but colour/SpO<sub>2</sub> (if available) not improved, increase oxygen to 30%
- If no response, increase by increments of 30% every 30 sec i.e:
  - Term air:** 30–60–90/100%
  - Preterm air:** 30–60–90%
- If chest compressions are required following chest movement with inflation breaths, increase oxygen to 90%
- If SpO<sub>2</sub> above levels in **Table 3** or >95% at 10 min of life, reduce oxygen

**Preterm deliveries**

- ≥26 weeks' gestation do not require routine intubation if respiratory effort good
- these babies can receive PEEP at 5 cm H<sub>2</sub>O via mask ventilation with oxygen supplementation as appropriate on the resuscitaire continuing PEEP support on transfer to NICU
- If respiratory effort is poor, at any point, or baby's condition deteriorates, intubate and ventilate

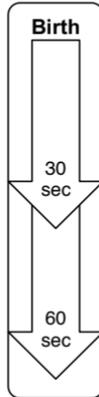
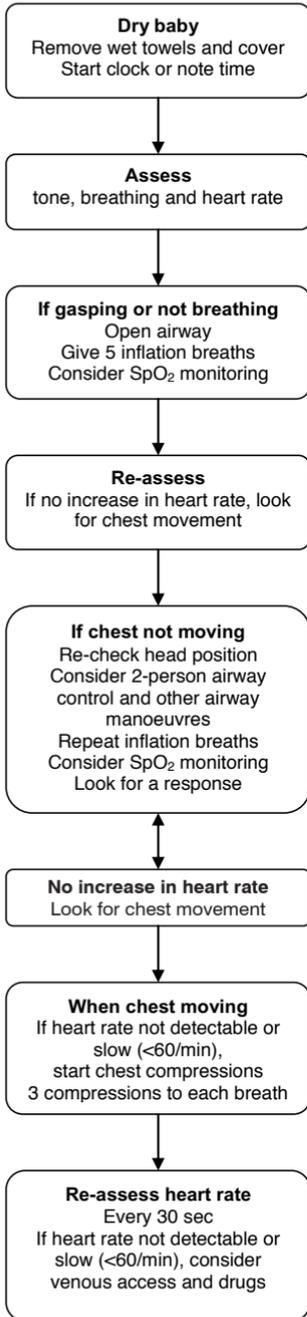
**DOCUMENTATION**

- Make accurate written record of facts (not opinions) as soon as possible after the event
- **Record:**
  - when you were called, by whom and why
  - condition of baby on arrival
  - what you did and when you did it
  - timing and detail of any response by baby
  - date and time of writing your entry
  - a legible signature

**COMMUNICATION**

- Inform parents what has happened (the facts)

Newborn life support algorithm



• AT  
•  
• ALL  
•  
• STAGES  
•  
• ASK:  
•

**Acceptable Pre-ductal SpO<sub>2</sub>**

2 min	60%
3 min	70%
4 min	80%
5 min	85%
10 min	90%

• DO  
•  
• YOU  
•  
• NEED  
•  
• HELP?  
•

### INTRAPARTUM PREPARATION

- Identify risk factors that may affect immediate care and devise management plan
- Ensure delivery room warm
- Check resuscitation equipment
- Pre-warm towels
- Summon multidisciplinary team members necessary for delivery and inform of risk factors

### IMMEDIATE CARE

#### At delivery

- If baby does not require immediate resuscitation, clamp cord after 1 min
- if local practice, document time cord is clamped
- If immediate resuscitation is required following assessment, clamp cord as soon as possible
- $\geq 28$  weeks' gestation, dry baby, **remove wet towels** and cover baby with **dry towels**
- $< 28$  weeks' gestation, do not dry body but place baby in plastic bag feet first, dry head only and put on hat
- Assess wellbeing and, if necessary, resuscitate – see **Cardiopulmonary resuscitation of the newborn** guideline
- Assess Apgar score at 1 and 5 min as a minimum. Document in intrapartum record
- If Apgar score at birth  $\leq 5$ , continue to assess and record every 5 min. Document any appropriate action taken until score is  $\geq 6$  or baby is transferred to neonatal care
- If baby delivered in poor condition or risk factors identified during intrapartum period:
  - double clamp cord and take cord blood for paired cord samples – see **Umbilical cord sampling** guideline
  - inform neonatal team of abnormal results e.g. pH level  $< 7$

- Encourage first breast feed within 1 hr and skin-to-skin contact for  $\geq 1$  hr
- Avoid performing routine postnatal procedures during first hour after birth unless requested by mother or treatment necessary for wellbeing of baby
- Identify babies at increased risk of hypothermia ( $< 37$  weeks or small for dates) and hypoglycaemia ( $< 37$  weeks or  $< 2.5$  kg, infants of diabetic mothers)

### Registration and identification

- Register and identify baby and mother as soon as possible. See **Registration and identification**

### THERMOREGULATION AND MANAGEMENT

#### *Baby's temperature in normal room environment should be 37°C*

- Encourage uninterrupted skin-to-skin contact with mother (or partner if appropriate)
- document offer and whether accepted by mother in intrapartum record. If declined or not done, note reasons
- Check baby's initial axillary temperature using digital thermometer while cradled by mother/partner (ideally 1–2 hr following birth). Record in intrapartum record
- If temperature  $\geq 36.4^\circ\text{C}$ , do not recheck axilla temperature unless:
  - specific risk factors e.g. small for dates, preterm, maternal pyrexia during labour, group B *streptococcus* (GBS), pre-labour spontaneous rupture of membranes (PROM) – see **Group B streptococcal disease** guideline and **Pre-labour rupture of membranes (PROM)** guideline
  - baby unwell
- Use digital thermometer and record subsequent temperature checks in postnatal record

### Hypothermia

- Although babies are able to maintain stable body temperature, their ability to stay warm may be overwhelmed by extremes of environmental temperatures and influenced by gestational age
- A newborn is more likely to develop hypothermia because of large surface area per unit of body weight

***Close observation by healthcare providers can often prevent neonatal hypothermia***

### Temperature <36.4°C in an otherwise well baby

- Apply hat to prevent further heat loss
- Encourage continued skin-to-skin contact with covering blanket
- Initiate early feeding
- Observe for general wellbeing
- Recheck temperature  $\leq 1$  hr
- If temperature remains <36.4°C, consider heated cot and further investigations – follow local protocol

### Temperature $\geq 38^\circ\text{C}$

***Temperature  $\geq 38^\circ\text{C}$  is abnormal and requires urgent attention. Notify neonatal team who will undertake full assessment, including physical examination***

- If baby appears unwell, or not maintaining own temperature, refer to neonatologist
- If problems identified, continue to observe baby until resolved. Document all management in postnatal records, including discussions with parents

### HYPOGLYCAEMIA

- Unless unwell, babies do not become hypoglycaemic even if feeding is delayed

- Keep warm and encourage to feed as soon as possible. They will suck well, settle between feeds and will not require monitoring – see **Hypoglycaemia** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)

### Symptoms and signs

- Signs of hypoglycaemia may require further investigation including possible admission to neonatal unit
- Blood glucose <2.6 mmol/L and any of the following symptoms:
  - apnoeic/cyanotic episodes
  - irritability
  - hypotonia
  - poor responsiveness
  - seizures

### Management

- See **Hypoglycaemia** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)

### INITIAL CARE AND FIRST EXAMINATION BY MIDWIFE

#### First hour of birth

- If baby appears unwell or has symptoms of hypoglycaemia, attempt to feed and refer to neonatal team
- Explain feeding cues to mother and offer help initiating first feed [see **Breastfeeding** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)]
- Document first feed in intrapartum record, include:
  - feeding method
  - time feed started
  - duration of feed

- If problems identified, continue to observe until resolved and document management in postnatal record – including discussions with parents
- Once skin-to-skin contact ceased, further assess newborn. Include:
  - birth weight
  - head circumference
  - initial examination
- Document all findings and discussions in intrapartum record

### EXAMINATION

- To identify major physical abnormalities/problems

### Consent and preparation

- Inform parents and obtain consent
- Keep baby warm and examine in quiet environment – ideally with parents present

### Procedure

#### Skin

- Hydration
- Rashes: including erythema toxicum, milia, miliaria, staphylococcal skin infection, candida
- Colour: pink/cyanosis/jaundice/pallor/plethora
- Acrocyanosis
- Cutis marmorata
- Bruises: traumatic lesions, petechiae

#### Head

- Palpate skull for:
  - sutures and fontanelle
  - excessive moulding or tension of fontanelle

#### Eyes

- Open gently
- Confirm presence
- Exclude subconjunctival haemorrhage

#### Ears

- Canal patency
- Position in relation to level of eyes
- Tags or pits

#### Nose

- Patent nares
- Accessory skin tags

#### Mouth

- Use torch to check:
  - palate intact
  - signs of 'tongue-tie' (defined by NICE as an inability to extend the tongue beyond tip of lower incisors)
  - presence of any teeth

#### Neck

- Run fingers down neck towards trunk to check for abnormal swelling or webbing

#### Arms and legs

- Extend and check for:
  - position, including talipes, symmetry of movement and muscle tone
  - exclude trauma during delivery e.g. swelling, fractures and bruising
  - presence/absence of digits and webbing of fingers and toes

#### Hands

- Palmar creases – may indicate congenital abnormality
- Fingers – extra or absent digits and webbing

#### Back

- Place baby on his/her side or abdomen
- Run fingers downwards along spine to exclude spina bifida or curvature

### Chest

- With baby supine, check presence of nipples and normal chest movement
- look for abnormal breathing e.g. flaring of nostrils, sub or intercostal recession, grunting, raised respiratory rate. If present, seek neonatal review

### Anus

- Presence and normality of appearance, position and patency

### Cord stump

- Examine to confirm presence of 3 vessels. If only 2 identified, neonatal junior doctor must review and document

### External genitalia (to determine sex)

#### Male

- Gently examine scrotum with thumb and forefinger. Check for descended testes and note any hydrocele
- Penis – check position of urethra and exclude hypospadias

#### Female

- Separate labia to confirm presence of vaginal and urethral orifices
- Examine perineum to detect sinuses

***If evidence of ambiguous genitalia, avoid gender assignment before expert evaluation to avoid confirmation of wrong sex.***

***Ask consultant neonatologist to discuss with parents as soon as possible.***

***Always use the term 'baby' and avoid using 'he', 'she' or, most importantly, 'it'***

### Abnormalities

- If baby unwell e.g. respiratory distress or has a major abnormality e.g. spina bifida, inform neonatal team immediately
- note other minor abnormalities and inform neonatal team next working day for prompt referral to appropriate clinician e.g. medical, surgical, orthopaedic etc.
- If abnormalities (or deviations from the norm) detected, inform parents and record findings and discussion in intrapartum record
- If in doubt, discuss with delivery suite co-ordinator immediately
- If community birth, community midwife will arrange admission to hospital for mother and baby

### VITAMIN K

#### Prophylaxis

- Vitamin K (Konakion® MM Paediatric) as a single dose (see **Table** below for dosage schedule)
- avoid IV administration for prophylaxis as it does not provide the same sustained protection as IM
- See **Vitamin K** guideline in Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)

Prophylaxis dosage

	Konakion® MM Paediatric
Healthy babies of $\geq 36$ weeks	<p><b>First line</b></p> <ul style="list-style-type: none"> <li>● 1 mg IM at birth or soon after</li> </ul> <p><b>Second line</b></p> <ul style="list-style-type: none"> <li>● 2 mg oral at birth, then</li> <li>● 2 mg oral at 4–7 days, then</li> <li>● 2 mg oral at 1 month if exclusively breastfed</li> </ul>
<p><b>Term babies at special risk</b></p> <ul style="list-style-type: none"> <li>● Instrumental delivery, caesarean section</li> <li>● Maternal treatment with enzyme-inducing anticonvulsants (carbamazepine, phenobarbital, phenytoin), rifampicin or warfarin</li> <li>● Requiring admission to neonatal intensive care unit (NICU)</li> <li>● Babies with cholestatic disease where oral absorption likely to be impaired</li> </ul>	<p>1 mg IM at birth or soon after</p> <p><b>Do not offer oral vitamin K</b></p>
Preterm babies $< 36$ weeks but $\geq 2500$ g	1 mg IM at birth or soon after
All babies $< 2500$ g	<p>400 microgram/kg (0.04 mL/kg) IM shortly after birth (maximum dose 1 mg)</p> <p>Do not exceed this parenteral dose</p> <p>The frequency of further doses should depend on coagulation status</p>
Babies who have or may have Factor VIII or Factor IX deficiency or other coagulation deficiency	Give orally unless results of Factor assays normal

**Babies with birth weight  $\geq 2500$  g**

- Administer Konakion® MM Paediatric 1 mg (0.1 mL) IM
- this is approximately **half** the ampoule volume and should be drawn up using 0.5 mL Omnican®-F syringe with 0.01 mL graduations supplied with ampoule

**Babies with birth weight  $< 2500$  g**

- Administer 400 microgram/kg (0.04 mL) with a maximum of 1 mg (0.1 mL) of Konakion® MM Paediatric IM
- round up dose to nearest hundredth [e.g. 300 microgram (0.03 mL), 500 microgram (0.05 mL) etc.]
- draw up dose using a 0.5 mL Omnican®-F syringe with 0.01 mL graduations supplied with ampoule

### REGISTRATION AND IDENTIFICATION

#### Registration

- Register birth – follow local birth registration procedure

#### Identification

- For the purposes of this guideline, the term 'wristband' will cover wristbands and any other form of identity band
- If wristbands produced by a non-regulated person (e.g. maternity care assistant), they must be counter-checked by a registered professional
- To reduce risk of mislabelling, **do not** prepare wristbands before delivery
- If used locally, apply security tag to baby as soon as possible

#### Before applying wristbands

- Check information on wristbands with mother and/or her birth partner

#### Mother

- Mother's wristband must contain the following information:
  - last name
  - first name
  - date of birth
  - NHS number (if not available, use local hospital number until NHS number available)
  - allergy information – according to local practice

#### Baby

- As soon as possible after delivery secure 2 wristbands to baby. These must contain the following information:
  - mother's last name
  - baby's date of birth
  - time of birth

- baby's NHS number (if not available, use local hospital number until NHS number available)

- if applicable, twin/triplet I/II/III

- Wristbands may cause damage to premature baby's skin – ensure alternative method of identification used

- Electronic security tag (if used locally)

#### Transferring baby

- Before transfer to ward, NICU or other specialist unit, ensure baby has correct identification
- When baby being transferred home, mother and midwife check both identification bracelets

#### Checking wristbands

- Check daily
- ensure bands *in situ* as per local practice

#### Detached wristband

- Apply new wristband
- If both wristbands lost:
  - inform midwife in charge of shift
  - check wristbands of all other babies on ward before replacing
  - complete incident report
- If  $\geq 2$  babies do not have wristband, follow local practice for identification

### INTRODUCTION

- Has a place in massive haemorrhage to reduce incidence and complications of homologous blood transfusions
- use endorsed by CEMACH, OAA, AAGBI and NICE

### INDICATIONS FOR USE

- Placenta praevia/abruption
- Placenta accreta/percreta
- Classical incision
- Maternal bleeding disorders or taking anticoagulants
- Laparotomy following postpartum haemorrhage (PPH)
- Women who refuse blood transfusion
- Emergency situations where there is difficulty with crossmatching – antibodies and blood not available

### CONTRAINDICATIONS

- Contamination of surgical field
- Malignancy
- Homogenous sickle cell disease

### PREREQUISITES

- Informed consent is required from woman before use
- outline procedure and theoretical risks of amniotic embolism and haemolytic disease in future pregnancies
- provide information leaflet to woman; if available locally
- may not be possible in emergency
- Decision to use cell saver should be made by senior clinicians
- All persons operating cell salvage machine to be trained in its use

### PROCEDURE OF COLLECTION AND PROCESSING

- 2 disposable parts
- collection
- processing

### Collection

- Unless excessive blood loss anticipated set up only the collection element
- processing part to be opened only when sufficient blood has been collected
- Use 2-sucker technique to reduce amniotic fluid contamination
- in certain circumstances i.e. placenta praevia, may be appropriate to commence cell salvage before delivery
- Use large bore sucker with low vacuum pressure of 150 mmHg
- in cases of heavy bleeding pressure may need to be increased to 300 mmHg
- Gently wash swabs in isotonic sodium chloride 0.9% in sterile bowl and process fluid

***Discontinue cell saver if contamination of the field by substances not licensed for IV use/ bowel contents***

***Do not suck blood from vaginal wounds and swabs***

***Remove obvious meconium***

***Presence of urine is not a contraindication***

### Processing

- Wash collected blood in sodium chloride 0.9% and centrifuge
- Label salvaged blood immediately
- Use within 6 hr of completion of processing
- Use leucocyte depletion filter and standard blood giving set to reinfuse blood
- Stop transfusion if hypotension occurs
- For rapid transfusions filter may be removed (at clinician's discretion) as a last resort (e.g. women who decline blood products)

**SPECIAL CIRCUMSTANCES**

**Jehovah's Witness**

- To maintain continuity all parts of circuit must be primed by sodium chloride 0.9% and attached to a dedicated cannula

**Rhesus negative women**

- Give 1500 IU anti-D after any reinfusion
- Send Kleihauer sample 30–40 min after reinfusion, in case more anti-D is required

## COLLAPSE (Including amniotic fluid embolism) • 1/5

Use this guideline for antenatal and postnatal collapse

### CAUSES

- Haemorrhage – see **Antepartum haemorrhage** and **Postpartum haemorrhage** guidelines
- Pulmonary embolus
- Concealed haemorrhage (e.g. broad ligament haematoma, hepatic rupture)
- Amniotic fluid embolus
- Myocardial infarction
- Aortic dissection
- Peripartum cardiomyopathy
- Rheumatic mitral stenosis
- Sepsis
- Intracranial haemorrhage
- Total spinal block (see **Epidural analgesia** guideline)
- Local anaesthetic or magnesium toxicity
- Hypoglycaemia
- Eclampsia (see **Eclampsia** guideline and **Severe pre-eclampsia** guideline)
- Anaphylaxis (follow local guideline for anaphylaxis)

### CARDIAC OR RESPIRATORY ARREST

*If a cardiac or respiratory arrest has occurred, call cardiac arrest team and commence cardiopulmonary resuscitation – see Collapse algorithm at end of this guideline*

### Organise

- Clearly state location of woman
- Crash-bleep resident anaesthetist, junior doctor and middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Inform consultant obstetrician
- If antenatal arrest >22 weeks' gestation, call neonatal team

- Ensure arrest team can gain immediate access to maternity unit
- Station someone (e.g. healthcare assistant, student etc.) at delivery suite door, to open door and direct team to woman
- Collect cardiac arrest trolleys and defibrillator

### Woman

- Avoid aortocaval compression >20 weeks' gestation
- Manually displace the uterus
- An anaesthetist should protect the airway as soon as possible with a cuffed endotracheal tube
- Do not consider the baby in this emergency
- If resuscitative attempts to revive >20 weeks' gestation woman have failed after 4 min, perform an immediate caesarean section to improve the chances of successful maternal resuscitation. Do this wherever the arrest has occurred without further preparation as she will need to deliver within minutes, and there will not be time for preparation or transfer to theatre
- Caesarean section is of no benefit to women <20 weeks' gestation

### SUDDEN COLLAPSE

### Woman

- Avoid aortocaval compression >20 weeks' gestation
- tilt the woman  $\geq 30^\circ$  using a wedged resuscitation board or a wedge, or manually displace uterus
- Check A, B and C and give oxygen at maximum rate via face mask

### Organise

- Bleep consultant obstetrician, on-call obstetric anaesthetist, junior doctor and middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) – follow local practice
- Summon as many staff as possible and allocate specific tasks, e.g.:
  - taking observations
  - recording events and their management, with times
  - communication
  - runner for samples and equipment
  - support for family

### Observations

- Commence HDU chart and observe:
  - pulse
  - blood pressure – at least every 15 min
  - respiratory rate
  - pulse oximetry
- If possible, transfer woman to room where HDU care can be provided

### Investigations

- Insert  $\geq 1$  large IV cannula
- Take blood for:
  - FBC
  - clotting studies including fibrin degradation products
  - crossmatch 2 units of blood
  - blood cultures
  - U&Es and glucose
  - LFTs
  - Troponin T or Troponin I [(whichever is used locally) (a marker for myocardial infarction)]

***It is the responsibility of person obtaining sample to complete blood bottles and forms  
Send bloods urgently to laboratory with healthcare assistant or porter  
Phone laboratory to request results urgently***

- Obtain arterial blood gases and consider arterial line insertion
- Check capillary blood glucose
- Arrange portable chest X-ray, particularly if oxygen saturation reduced or central venous catheter inserted owing to risk of pneumothorax
- 12-lead ECG – particularly important if any form of cardiac disease suspected
- ECG must be reviewed by a doctor competent in ECG interpretation

### History and examination

- Obtain history from those present before collapse occurred
- Examine woman to try to identify most likely cause of collapse

### IV access and fluids

- Commence IV fluids
- Unless cardiopulmonary function is rapidly restored, consider a central venous catheter

**FURTHER TREATMENT**

- Further treatment is dependent on diagnosis

<b>Diagnosis</b>	<b>Treatment</b>
Pulmonary embolism	See <b>VTE – Pulmonary embolism</b> guideline
Concealed haemorrhage	See <b>Antepartum haemorrhage</b> and <b>Postpartum haemorrhage</b> guidelines
Amniotic fluid embolism	See <b>Amniotic fluid embolism</b> below
Myocardial infarction	Seek advice from cardiologist
Aortic dissection	
Peripartum cardiomyopathy	
Rheumatic mitral stenosis	
Sepsis	See <b>Sepsis</b> guideline
Intracranial haemorrhage	Seek advice from physician
Total spinal block	Call consultant anaesthetist – See <b>Epidural analgesia</b> guideline
Toxicity	Call consultant anaesthetist – See <b>Epidural analgesia</b> guideline, <b>Eclampsia</b> guideline or <b>Severe eclampsia</b> guideline
Hypoglycaemia	IV glucose – see <b>Diabetes</b> guidelines
Eclampsia	See <b>Eclampsia</b> guideline
Anaphylaxis	Give adrenaline 500 microgram (0.5 mL of 1:1000 solution) <b>IM</b> into midpoint of anterolateral aspect of thigh

**Be aware of increase in cardiac causes of collapse**

**Risk factors for myocardial infarction**

- Obesity
- Pre-existing hypertension
- Diabetes mellitus
- Family history
- Age >35 yr

**Symptoms and signs prompting investigation**

- Severe chest pain
- Chest pain radiating to neck, jaw or back
- Chest pain associated with other features (e.g. agitation, vomiting or breathlessness, tachycardia, tachypnoea and orthopnoea)

*Aortic dissection is a cause of chest or intrascapular chest pain, particularly in the presence of systolic hypertension. It is commonly associated with Marfan's syndrome. If suspected, request urgent cardiologist review*

**AMNIOTIC FLUID EMBOLISM**

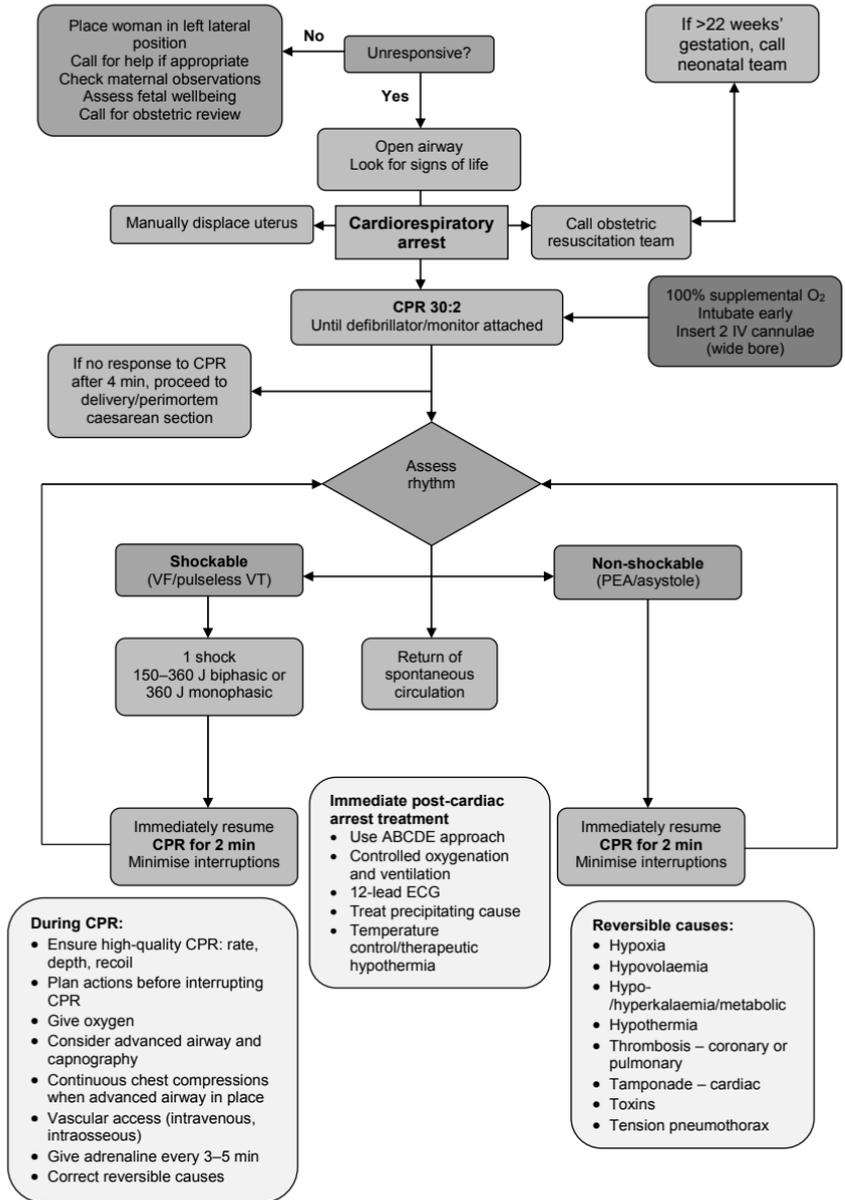
- Rare and often fatal
- Presentation usually sudden during labour or immediately postpartum
- Acute dyspnoea, cyanosis, shock, cardiac arrest, bleeding from disseminated intravascular coagulation (DIC) and tonic-clonic seizures may all occur
- Sudden change in woman's behaviour can be an early warning feature

### TREATMENT

#### As above, plus:

- If necessary, deliver immediately – ideally vaginally. If not possible, by caesarean section under general anaesthetic
- Insert second large bore (16 G) IV cannula and prepare to manage massive obstetric haemorrhage (see **Postpartum haemorrhage** guideline)
- Consider early insertion of central venous catheter and arterial line
- Discuss need for blood products (including fresh frozen plasma to correct DIC) with consultant haematologist, without waiting for blood results
- Woman will require circulatory support, which can include inotropes, with invasive monitoring
- Transfer to critical care unit
- Report all cases of suspected or proven amniotic fluid embolism, whether fatal or not to National amniotic fluid embolism register via UKOSS (UK obstetric surveillance system)

**Maternal collapse algorithm**



See also:

- Labour management guideline
- Latent phase of labour guideline

### DELAY IN FIRST STAGE

- Cervical dilatation <2 cm in 4 hr in first labours
- Cervical dilatation <2 cm in 4 hr, or slowing in progress of labour for second or subsequent labours

### Assessment of progress

- Include:
  - parity
  - rate of cervical dilatation
  - woman's emotional state
  - descent and rotation of baby's head
  - changes in strength, duration and frequency of uterine contractions

### Interventions

- Give support, hydration and appropriate and effective pain relief

### Amniotomy

- Advise this will shorten labour by approximately 1 hr but may increase strength and pain of contractions
- 2 hr after amniotomy, perform vaginal examination. Delay confirmed if cervix has dilated <1 cm
- Amniotomy alone is not an indication for electronic fetal monitoring (EFM)

### Oxytocin

- Once diagnosis of delay made by vaginal examination 2 hr after amniotomy, consider oxytocin – see **Oxytocin** guideline
- In a nulliparous woman, midwife may start oxytocin after discussion with obstetric team

**Before commencing oxytocin, middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) must review parous woman.**

**If previous caesarean section, discuss use of oxytocin with obstetric consultant.**

**Perform at least an abdominal palpation**

**Repeat vaginal examination may also be appropriate**

- Advise woman that oxytocin will increase frequency and strength of contractions and, where anaesthetist available, offer epidural before oxytocin started
- commence EFM

### Monitoring

- Perform vaginal examination 4 hr after commencing oxytocin
- if  $\geq 2$  cm progress, repeat vaginal examination 4-hrly
- if <2 cm progress after 4 hr of regular contractions, further review by obstetric medical team and possible caesarean section

## SECOND STAGE

### Definition

#### Passive second stage

- Full dilatation of cervix without involuntary, expulsive contractions

#### Active second stage

- Vertex or breech visible
- Expulsive contractions
- Active maternal effort in absence of expulsive contractions

## DELAY IN SECOND STAGE

### Definition of delay

#### Nulliparous women

- Active second stage is delayed if baby not delivered after 2 hr

### Parous women

(Includes multipara women who have had previous caesarean section)

- Active second stage is delayed if baby not delivered after 1 hr

### Assessment of progress

- Include:
  - maternal behaviour
  - effectiveness of pushing
  - fetal wellbeing
  - fetal position and station
- These factors help determine timing of vaginal examinations and need for middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) review

### Management

#### All women

- In nulliparous women with inadequate contractions at **start** of second stage, consider oxytocin with epidural
- If woman excessively distressed, support, sensitive encouragement and adequate analgesia are particularly important
- Continue epidural top-ups in second stage
- Change position
- Ensure bladder empty
- Perform amniotomy
- If contractions adequate, there is no advantage to starting oxytocin

#### Women who have received an epidural

- Following diagnosis of full dilatation, delay active pushing (active second stage) for 1 hr unless:
  - head visible
  - woman has urge to push
  - concern about fetal wellbeing
- Oxytocin is not routinely required in second stage

### Nulliparous women

- Allow up to 1 hr passive second stage (with/without epidural)
- Then, after 1 hr of active second stage, perform a repeat vaginal examination to assess progress and perform amniotomy, if membranes still intact. Inform midwife co-ordinator
- in absence of any progress, consider asking middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) to expedite delivery
- If delivery not occurred in a nulliparous woman within 2 hr of start of active second stage, call middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Repeat obstetric review every 15–30 min until delivery
- See **Timing of delivery** below

#### Parous women

- Allow up to 1 hr passive second stage (with/without epidural)
- After 1 hr of active second stage, call middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Repeat obstetric review every 15–30 min until delivery
- See **Timing of delivery** below

### Monitoring

- Review advancement of presenting part every 15–30 min until delivery

### TIMING OF DELIVERY

- Delivery should occur within 3 hr for a nulliparous and within 2 hr for a parous woman of the active second stage
- If operative vaginal delivery is offered, explain the reason to the woman and her birth partner(s)

***The time taken to perform a caesarean section or instrumental delivery (especially if a trial in theatre indicated) must be taken into account when timing decision for operative delivery***

**BACKGROUND**

Diabetes mellitus (DM) – metabolic disorder of multiple aetiology characterised by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both

**Pre-existing diabetes**

**Type 1**

- Autoimmune process
- Pancreatic islet beta-cell destruction
- Increased risk of maternal diabetic ketoacidosis
- Characterised by:
  - absolute insulin deficiency
  - abrupt onset of severe symptoms
  - dependence on exogenous insulin to sustain life

**Type 2**

- Common major form of diabetes
- Defects in insulin secretion, almost always from insulin resistance
- May be asymptomatic and remain undiagnosed

**Gestational diabetes**

- Defined as carbohydrate intolerance of variable severity with onset of first recognition during pregnancy
- may have pre-existing diabetes

**PREGNANCY CONFIRMED**

**Drugs**

- Folic acid supplements 5 mg/day from preconception until ≥12 weeks' gestation
- Aspirin 75 mg/day for pre-gestational diabetes > 12 weeks' gestation
- Review medications
  - metformin can be prescribed in preconception period, during pregnancy and breastfeeding and can be used as an adjunct or alternative to insulin
  - stop any angiotensin converting enzyme inhibitor (ACEI) medication and angiotensin receptor blocker (ARB) before conception/as soon as pregnancy diagnosed and start methyldopa or labetalol as an alternative for hypertension
  - beta blockers can mask signs of hypoglycaemia
  - stop statins before conception/as soon as pregnancy diagnosed
- Refer women with diabetes or previous gestational diabetes to diabetic antenatal clinic as soon as pregnancy diagnosed. See **Care in diabetic antenatal clinic** below
- Use 75 g 2-hr oral glucose tolerance test (OGTT) to test for gestational diabetes in women with risk factors
- Offer women who have had gestational diabetes in a previous pregnancy:
  - early self-monitoring of blood glucose or
  - 75 g 2-hr OGTT as soon as possible after booking (whether in the first/ second trimester) – if result normal, repeat at 24–28 weeks' gestation
- Women with any other risk factors for gestational diabetes: offer 75 g 2-hr OGTT at 24–28 weeks' gestation

**Table 1: Risks from diabetes**

To mother	To fetus
<ul style="list-style-type: none"> <li>● Miscarriage</li> <li>● Hypoglycaemia/hyperglycaemia</li> <li>● Ketoacidosis</li> <li>● Hypertension/pre-eclampsia</li> <li>● Retinopathy/nephropathy</li> <li>● Induction of labour/caesarean section (CS)</li> <li>● Future diabetes</li> </ul>	<ul style="list-style-type: none"> <li>● Congenital malformation</li> <li>● Stillbirth/neonatal death</li> <li>● Premature delivery</li> <li>● Fetal macrosomia</li> <li>● Birth trauma</li> <li>● Neonatal hypoglycaemia</li> <li>● Polycythaemia</li> <li>● Future obesity and diabetes</li> </ul>

### CARE IN DIABETIC ANTENATAL CLINIC

- Women with confirmed diabetes to have contact with diabetes team every 2 weeks for assessment of glycaemic control
- timing of contact will depend on local policy and woman's individual needs
- Prompt diagnosis and treatment of UTI, hypertension and pre-eclampsia during pregnancy
- Ketoacidosis – admit and seek early senior involvement
- If fasting glucose 6.1–7 mmol/L without associated complications (macrosomia/polyhydramnios) – consider metformin treatment
- Consider variable rate intravenous insulin infusion (VRIII) for women nil-by-mouth (includes vomiting) who are usually treated with insulin/metformin

**Table 2 – Antenatal care (joint obstetric/diabetic clinic)**

Appointment	Care of women with diabetes during pregnancy
6–9 weeks	<ul style="list-style-type: none"> <li>● Confirm viability and gestational age by ultrasound scan</li> <li>● Information, advice and support on glycaemic control, establish extent of complications</li> <li>● offer smoking cessation advice/referral</li> <li>● Refer to dietitian for dietary assessment and advice</li> <li>● Review medications</li> <li>● BP, urinalysis for ketones and protein (ongoing in pregnancy)</li> <li>● Retinal and renal assessment if not in previous 12 months</li> <li>● Glucose targets:                             <ul style="list-style-type: none"> <li>● fasting 3.5–5.3 mmol/L</li> <li>● 1 hr post meal &lt;7.8 mmol/L</li> </ul> </li> <li>● Check and demonstrate glucose meter and glucagon kit, and explain hypoglycaemia and hypo awareness</li> <li>● Advise to test for ketone if BG &gt;10 mmol/L</li> </ul>
Booking appointment (10 weeks)	<ul style="list-style-type: none"> <li>● Advice about how diabetes will affect pregnancy, birth and early parenting</li> <li>● Advise aspirin 75 mg daily from 12 weeks to delivery, unless contraindicated</li> <li>● Additional to booking bloods:                             <ul style="list-style-type: none"> <li>● HbA<sub>1c</sub>, TSH, T3, T4, U&amp;E, LFT</li> <li>● urine for albumin/creatinine ratio</li> </ul> </li> <li>● Full consultant booking ≤12 weeks' gestation</li> </ul>
16 weeks	<ul style="list-style-type: none"> <li>● Review glycaemic control</li> <li>● HbA<sub>1c</sub> levels, retinal (and renal) assessment if required</li> </ul>
18–20 <sup>+6</sup> weeks	<ul style="list-style-type: none"> <li>● Anomaly scan (including 4 chamber view of fetal heart and outflow tracts and 3 vessel view of heart)</li> </ul>
24 weeks	<ul style="list-style-type: none"> <li>● Routine antenatal care</li> </ul>

**Table 2 – Antenatal care (joint obstetric/diabetic clinic) cont.**

<b>Appointment</b>	<b>Care of women with diabetes during pregnancy</b>
28 weeks	<ul style="list-style-type: none"> <li>● Ultrasound monitoring of fetal growth and amniotic fluid volume</li> <li>● Retinal assessment (as required) for women with pre-existing diabetes who did not have diabetic retinopathy at their first antenatal clinic visit</li> <li>● Group and red cell antibodies, and FBC</li> </ul>
32–34 weeks	<ul style="list-style-type: none"> <li>● Ultrasound monitoring of fetal growth and amniotic fluid volume</li> <li>● Plan mode and timing of delivery (see <b>Diabetes – Labour guideline</b>)</li> <li>● Explain benefits of breastfeeding and postnatal fasting glucose check</li> </ul>
36 weeks	<ul style="list-style-type: none"> <li>● Ultrasound monitoring of fetal growth and amniotic fluid volume</li> <li>● Discuss: analgesia/anaesthesia therapy during and after birth care of baby/breastfeeding</li> <li>● If CS planned &lt;39 weeks, administer steroids with VR11</li> <li>● Prescribe postnatal treatment and doses</li> <li>● Advise close monitoring of fetal movements</li> </ul>
37–38 <sup>+6</sup> weeks	<ul style="list-style-type: none"> <li>● Induction of labour/CS</li> <li>● Weekly LV and Doppler scan &gt;38<sup>+6</sup> if not delivered</li> </ul>
40 weeks	<ul style="list-style-type: none"> <li>● If well controlled, uncomplicated gestational diabetic on diet, can wait until 40<sup>+6</sup> weeks</li> </ul>

**Management of diabetes**

**Monitor blood glucose targets**

- Advise women to test fasting and 1 hr postprandial blood glucose levels after every meal during pregnancy
- Aim for fasting blood glucose of 3.5–5.3 mmol/L and 1 hr postprandial blood glucose <7.8 mmol/L
- Teach women to adjust insulin dependent on glucose reading
- Advise women who drive to check BG before driving, and to avoid driving if high frequency of hypoglycaemic episodes
- Check HbA<sub>1c</sub> each trimester

**Treatment**

- In most women, gestational diabetes will respond to changes in diet
- If diet and exercise do not control blood glucose levels and if ultrasound shows incipient fetal macrosomia, give metformin and/or insulin
- In type 1 and 2 diabetes, adjust therapy to maintain blood glucose targets
- Women with type 2 diabetes benefit from continuing metformin treatment throughout pregnancy

**Metformin and insulin are the only diabetes medications safe for use in pregnancy**

### Women on insulin

- Discuss risks of hypoglycaemia
- offer concentrated oral glucose solution to women taking insulin, and glucagons to women with type 1 diabetes. If accepted, train woman and partner to use

### DIABETIC KETOACIDOSIS

- Check ketone level if:
  - BG > 10 mmol/L or
  - unwell with vomiting/fever/any systemic illness
- Diabetic ketoacidosis (DKA) is a medical emergency
  - may contribute to intrauterine death and significant maternal morbidity – treat aggressively
  - normal capillary ketone levels < 0.6 mmol/L
  - inform both obstetric and medical consultants and manage woman in a high dependency setting
  - stabilisation of DKA may be necessary before considering emergency delivery

### RETINOPATHY

- Refer women with moderate retinopathy to ophthalmology (potential for rapid development of neovascularisation)
- Offer assessment before conception/as soon as possible after first visit (16–20 weeks' gestation)
  - if first assessment normal, repeat at 28 weeks

### NEPHROPATHY AND HYPERTENSION

- Offer all women with type 1 and 2 diabetes low-dose aspirin (75 mg/day) from 12 weeks' gestation until delivery, to reduce risk of pre-eclampsia
- If serum creatinine > 120  $\mu$ mol/L, estimated GFR < 45 or urine albumin/creatinine ratio > 30 – refer to nephrologist

## PREPARATION

- Discuss with woman

### Time and mode of delivery

- Woman with diet-controlled or metformin controlled diabetes with normally grown fetus:
  - advise induction of labour not to be delayed beyond 40<sup>+6</sup> weeks' gestation
- Woman on insulin/metformin:
  - advise induction of labour/caesarean section (CS) at 37–38<sup>+6</sup> weeks' gestation
- Woman on insulin pump
  - manage as per local Trust policy
  - if planned CS and <39 weeks' gestation administer course of corticosteroids
  - if undelivered at 38<sup>+6</sup> weeks, commence weekly liquor volume and umbilical artery doppler

### Analgesia and anaesthesia

- Offer women with diabetes and co-morbidities (e.g. obesity or autonomic neuropathy) obstetric anaesthetic assessment in third trimester

### Care during and after labour

- Analgesia and anaesthesia
- Good glycaemic control
- Continuous fetal monitoring
- Prevention of neonatal hypoglycaemia
- Care of baby/breastfeeding
- Planned delivery:
  - poor glycaemic control: normal insulin/metformin dose evening before delivery; commence variable rate intravenous insulin infusion [VRIII (formerly known as sliding scale)] by 2200 hr
  - good glycaemic control: commence VRIII 0700–0800 hr on morning of delivery

## PRETERM LABOUR

- Pulmonary maturation delayed in fetuses of diabetic women, particularly where control has been poor
- Where premature delivery anticipated for women with confirmed diabetes, give betamethasone
  - woman will require additional insulin; follow local policy
- Steroid administration worsens diabetic control and may lead to ketoacidosis in women with pre-existing type 1 diabetes – anticipate an increase in insulin requirement and administer using local VRIII regimen

## INDUCTION OF LABOUR

- See **Induction of labour** guideline

### Diabetic control

- Before labour established, normal metformin/insulin regimen and diet, together with blood glucose monitoring

## DURING LABOUR

### Risk

- Increased risk of shoulder dystocia particularly if baby macrosomic – ensure middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) is available on delivery suite during second stage – see **Shoulder dystocia** guideline
- Increased risk of cephalopelvic disproportion – be vigilant for delay and, if occurring, use oxytocin with caution

## Monitoring during labour

### Woman

- Record capillary glucose level hourly
  - check capillary blood ketones if glucose > 10 mmol/L
- Once VRIII regimen commenced, monitor blood glucose hourly

## DIABETES – LABOUR • 2/3

- Monitor blood glucose at 30 min intervals after induction of general anaesthesia and birth of baby until woman fully conscious
- If blood glucose >10 mmol/L infuse sodium chloride 0.9%
- Test all urine samples for ketones
- if positive, woman to receive high dependency care

### Continuous fetal monitoring

- Maternal hyperglycaemia may cause fetal acidosis. If any EFM abnormalities, check maternal glucose
- Fetal blood sampling if indicated, as normal labour – see **Fetal blood sampling** guideline

### Metformin and diet controlled

- If blood glucose elevated e.g. persistently above local Trust policy threshold, commence insulin and IV fluid regimen below
- When labour established, stop metformin

### Gestational diabetes mellitus

- **Insulin controlled** – dependent upon amount of insulin required – dosage as per local Trust policy
- Measure capillary blood glucose hourly during established labour and delivery
- if elevated twice, according to local threshold:
  - diet controlled: start VRIII
  - insulin/metformin treated: start VRIII

### Elective CS

- Review at 34–36 weeks to discuss management of glucose control and pre-operative management
- If CS carried out <39 weeks' gestation, administer antenatal steroids with a VRIII. Refer to local Trust guideline for management

- Women on insulin:
  - admit as inpatient night before procedure
- Commence insulin and fluid regimen following local policy

### Emergency CS

- Check blood glucose level and commence insulin and IV fluid regimen below

### INSULIN AND IV FLUID REGIMEN

#### Insulin regimen

- 50 units soluble insulin diluted to 50 mL with sodium chloride 0.9% in a 50–60 mL syringe (1 mL = 1 unit of insulin)
- Administered via syringe pump
- Adjust dose hourly according to glucose levels
- Nil-by-mouth: administer IV fluids as per Trust VRIII proforma via infusion pump

#### IV VRIII

- Target blood glucose 4.0–7.80 mmol/L
- During labour blood glucose 4.0–7.0 mmol/L
- Avoid large changes in insulin infusion rate and therefore in glucose concentration
- If blood glucose not maintained within normal range, contact diabetes team
- Observe for hypoglycaemia
- consider increasing infusion to 150 mL/hr or glucose 10%
- Check for blood/ketones and refer to medical team for advice
- If fluid restricted consider glucose 10% IV at 75 mL/hr
- Check potassium levels 4-hrly and adjust quantity in IV fluids accordingly

**Always use commercially produced pre-mixed bags of infusion fluid and potassium chloride**

### POSTNATAL MANAGEMENT

- Diabetes team will write management plan
- Do not allow 6 hr (early) discharge
- Stop insulin and metformin for women with gestational diabetes
- Follow postnatal regime for women with pre-pregnancy diabetes
- Ensure patient eating and drinking normally
- provide meal/snack
- Give insulin when next due
- Stop IV insulin and glucose after 30 min

***Inform women with insulin-treated diabetes that they are at increased risk of hypoglycaemia in postnatal period, especially when breastfeeding. Advise to have a meal or carbohydrate snack available before or during feeds and reduce insulin doses by 20%***

### Type 1 and 2 diabetes

- Close monitoring of glucose levels
- Type 2 diabetic wanting to breastfeed, and previously on oral hypoglycaemic agents (other than metformin), to remain on insulin
- Observe and treat hypoglycaemia
- Review by diabetes specialist midwife or medical team

### Gestational diabetes

- Ensure blood glucose measurements returning to normal  $\geq 4$  tests in first 24 hr – fasting and 1 hr post meals
- Arrange postnatal GTT or fasting blood glucose at 6–13 weeks according to local Trust policy
- At 6 week assessment:
  - inform woman of risk of developing type 2 diabetes later in life and preventative measures i.e. diet, exercise and ideal weight
  - recommend annual screening for diabetes

### Neonatal care

- See Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal **Hypoglycaemia** guideline or follow local practice

### FUTURE PLANS/ PRE-PREGNANCY ADVICE

- Woman to seek advice from endocrinologist and diabetes specialist nurse regarding pre-conceptual care
- Advise early contact with joint obstetric and endocrinologist services once pregnancy is confirmed

## INTRODUCTION

Optimisation of glycaemic control and advice on preparation for pregnancy have been shown to improve pregnancy outcomes in type 1 and 2 women

## INDICATIONS FOR WHO AND WHEN TO SCREEN

Early screening	24–28 weeks – risk factors for gestational diabetes
<ul style="list-style-type: none"> <li>● Offer women who had gestational diabetes in a previous pregnancy:</li> <li>● early self-monitoring of blood glucose or</li> <li>● 75 g 2-hr OGTT as soon as possible after booking (whether in first/second trimester), and further 75 g 2-hr OGTT at 24–28 weeks if results of first OGTT are normal</li> </ul>	<ul style="list-style-type: none"> <li>● BMI &gt;30 kg/m<sup>2</sup></li> <li>● Previous macrosomic baby ≥4.5 kg</li> <li>● Previous gestational diabetes</li> <li>● First degree relative with type 1 or type 2 diabetes</li> <li>● Women on long-term antipsychotic medications</li> <li>● Family origin with a high prevalence of diabetes – south Asian (specifically country of family origin: India, Pakistan or Bangladesh), black Caribbean and middle Eastern (specifically country of family origin: Saudi Arabia, United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon or Egypt)</li> <li>● Previous unexplained stillbirth</li> <li>● Glycosuria                             <ul style="list-style-type: none"> <li>● 1 episode of 2+</li> <li>● 2 episodes of 1+</li> </ul> </li> </ul>

## How

- Use 75 g 2-hr OGTT to test for gestational diabetes
- Screen positive
  - fasting plasma glucose concentration ≥5.6 mmol/L or
  - 2 hr plasma glucose concentrations ≥7.8 mmol/L
- See **Diabetes – Antenatal care** guideline

## FOLLOW-UP

- Offer women with diagnosis of gestational diabetes a review with the joint diabetes and antenatal clinic within 1 week
- Inform primary healthcare team when woman diagnosed with gestational diabetes

## INTRODUCTION

- DFM may identify at-risk fetuses
- The evidence that intervention can improve the outcome is less convincing

## RECOGNITION

- Advise women to be aware of their baby's individual pattern of movements
- If  $\leq 24$  weeks' gestation, arrange midwife to see woman within 24 hr in hospital or community
- If  $> 24$  weeks' gestation, advise woman to attend maternity department

## MANAGEMENT

### Assessment at any gestation

- Check for previous or current medical problems (e.g. bleeding, oligohydramnios, polyhydramnios, small for dates, pre-eclampsia, hypertension, diabetes mellitus, previous poor obstetric history, smoking)
- Blood pressure
- Urinalysis
- Abdominal palpation to assess fetal growth; symphysis fundal height measurements can be performed  $\geq 24$  weeks' gestation
- plot on a fetal growth chart according to local practice

### Investigations

- If fundus measures small for dates:
  - ultrasound scan for growth, liquor volume
  - umbilical artery Doppler study
- Electronic fetal monitoring (EFM) trace dependent on gestation – see below
- EFM trace is a test for hypoxia. When used in antenatal period, it is essentially an assessment of immediate fetal condition

### $\leq 24$ weeks' gestation

- Auscultate fetal heart, separately identifying maternal pulse
- If normal assessment:
  - reassure woman that irregular movement patterns can be experienced in early pregnancy
  - advise to return again if concerned about fetal movements
- Manage any abnormalities found

### 24–26 weeks' gestation

- Auscultate fetal heart and assess symphysis fundal height
- If normal assessment:
  - reassure
  - resume normal antenatal care
  - advise to return if further concerns about movements
- If reduced symphysis fundal height, refer for obstetric assessment

### Second episode of DFM

- Growth scan (unless performed in previous 2 weeks)

### 26–28 weeks' gestation

- **Perform EFM trace**, ideally computerised (if available)
- **Criteria met:** reassure, allow home and advise to return if further concerns about fetal movements
- **EFM trace non-reassuring or abnormal**
  - inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) urgently
  - consider cannulation
  - FBC and group and save
  - consider transfer to delivery suite
- **Criteria not met after 45 min:** continue EFM and call middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)

- If symphysis fundal height reduced for dates, arrange growth scan (unless performed in previous 2 weeks)
- If adequate EFM trace cannot be obtained despite midwife sitting with woman, seek middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) opinion

### >28 weeks' gestation

#### **First episode DFM**

- EFM trace, ideally computerised (if available)
- Assess symphysis fundal height
- if symphysis fundal height reduced for dates, arrange growth scan (unless performed in previous 2 weeks)
- **EFM trace normal with fetal movement felt and no risk factors (see Risk factors below) for fetal growth restriction (FGR)/stillbirth identified:**
  - reassure, allow home and advise to return again if concerned about fetal movements
- **EFM trace normal with persistent DFM and/or risk factor (see Risk factors below) for FGR/stillbirth identified:**
  - reassure, allow home and advise to return again if concerned about fetal movements and expect to be contacted for growth scan
  - arrange growth scan (unless performed in previous 2 weeks)
  - manage any abnormalities found
- **EFM trace non-reassuring or abnormal:**
  - inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) urgently
  - consider cannulation
  - FBC and group and save
  - transfer to delivery suite

#### **Second episode DFM**

- EFM trace, ideally computerised (if available)
- **EFM trace normal:**
  - reassure, allow home and advise to return again if concerned about fetal movements and expect to be contacted for growth scan
  - arrange growth scan (unless performed in previous 2 weeks), liquor volume and umbilical artery Doppler
- >28 weeks' gestation, women with second episode of DFM within 1 month of first DFM:
  - refer to their consultant's next antenatal clinic
- **EFM trace non-reassuring or abnormal:**
  - inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) urgently
  - FBC and group and save
  - consider cannulation
  - transfer to delivery suite

#### **Risk factors**

- Known FGR
- Hypertension
- Diabetes
- Extremes of maternal age
- Primiparity
- Smoking
- Placental insufficiency
- Congenital malformation
- Obesity
- Racial/ethnic factors
- Poor past obstetric history (e.g. FGR and stillbirth)
- Genetic factors
- Issues with access to care

#### **Management plan in labour**

- Continuous EFM in labour
- If admitted with ruptured membranes or suspected early labour, EFM

### DFM AND EFM TRACE NON-REASSURING/ABNORMAL

- **EFM trace non-reassuring/abnormal:**
- inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) urgently
- FBC and group and save
- All women with non-reassuring/abnormal EFM must be reviewed by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow). It may or may not be appropriate to repeat EFM. If repeated, consider computerised EFM if available

***Remember EFM is an investigation. Continuing the monitoring will not improve fetal condition – use whole clinical picture to assess fetal wellbeing***

- If appropriately repeated EFM trace is normal, it may be reasonable to allow woman home
- Arrange growth scan to exclude other cause for concern about fetal wellbeing, (e.g. reduced liquor), which might also predispose to decelerations from cord compression

### INABILITY TO IDENTIFY FETAL HEART

- Ultrasound scan (ideally in maternity scan department)
- If out-of-hours, performed by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant competent to use portable labour ward ultrasound machine
- If scan identifies fetal death (second trained operator to confirm this), inform on-call consultant obstetrician. It is unlikely that woman will need immediate delivery – see **Perinatal bereavement** guideline

Eclamptic seizures are often self-limiting. See also – **Severe pre-eclampsia** guideline

### RESUSCITATION AND STABILISATION

- **Airway, Breathing, Circulation** and lateral tilt
- Do not leave woman alone. Call for help from senior midwife, middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) and inform consultant obstetrician and consultant anaesthetist to attend as soon as possible
- During convulsion, consider personal safety and aim to prevent maternal injury
- as soon as possible, position woman in recovery position and administer 15 L oxygen via close-fitting face mask
- Attach pulse oximeter and automatic blood pressure monitor
- As soon as is **safely** possible, site two 16 gauge (grey) Venflons™
- Insert Foley indwelling catheter, and monitor urine output hourly with strict fluid restriction

### INVESTIGATIONS

- Obtain blood and send urgently for:
  - FBC
  - clotting studies
  - U&E
  - LFT
  - urates
  - group and save
- Consider arterial blood gases

### TREATMENT

- Magnesium sulphate is treatment of choice – see **Severe pre-eclampsia** guideline, **Magnesium sulphate**
- Treat recurrent seizures with either further IV bolus of magnesium sulphate or increase in infusion rate – see **Severe pre-eclampsia** guideline, **Magnesium sulphate**

- If repeated seizures not responding to magnesium sulphate, consultant obstetrician and anaesthetist decide on use of diazepam 5–10 mg or thiopentone, together with intubation and transfer to intensive care
- consider CT scan to exclude other causes
- Blood pressure control – see **Severe pre-eclampsia** guideline

### Post seizure

- Once seizure ended, auscultate lungs and commence continuous oxygen saturation monitoring
- Transfer to an area where high dependency care can be provided with full HDU monitoring
- Monitor consciousness level and document on HDU chart
- Full neurological assessment following seizure to rule out localising signs of alternative causes e.g. intracranial haemorrhage
- If pregnant, perform EFM
- Once woman stabilised, plan to deliver

### Delivery

- See **Severe pre-eclampsia** guideline

***Eclampsia is nearly always an indication for rapid delivery regardless of gestation  
Woman's condition will always take priority over fetal condition***

### POSTNATAL CARE

- HDU care for minimum of first 24 hr as for severe pre-eclampsia
- Subsequent postnatal management – see **Severe pre-eclampsia** guideline
- Record incident using local incident reporting procedure

### Drugs

- See **Severe pre-eclampsia** guideline

## AIM

To ensure fetal wellbeing in conditions/situations that increase the risk to the fetus before the onset of labour

## Indications for EFM (include but not limited to):

### Maternal

- Pre-eclampsia/eclampsia
- Antepartum haemorrhage
- Prolonged rupture of membranes >24 hr
- Prolonged pregnancy >42 weeks
- Induced labour
- Abdominal pain
- Trauma/after a fall/RTC
- Cholestasis
- Abnormality on auscultation (abnormal baseline, decelerations)

### Fetal

- Intrauterine growth restriction/abnormal Doppler
- Preterm labour
- Oligohydramnios/polyhydramnios
- External cephalic version
- Iso-immunisation
- Suspicious antenatal EFM trace
- Reduced fetal movements >26–28 weeks' gestation as per local practice

## When to monitor

- >26–28 weeks' gestation as per local practice

## How to monitor

- Perform abdominal examination including symphyseal fundal height (SFH)
- Listen to fetal heart (FH) with a Pinard stethoscope before commencing EFM
- Palpate maternal pulse simultaneously to differentiate fetal and maternal heart rates

## Duration of monitoring

- If using a traditional CTG monitor ≥20 min monitoring is required in order to assess CTG
- 2 accelerations in 10 min is a reactive trace. Sleep pattern with no acceleration does not exceed 40 min in vast majority
- Document reasons for monitoring >40 min in maternal healthcare record
- See section **Dawes-Redman** if in use

## INTERPRETATIONS AND ACTIONS

### Normal/reassuring

- Normal EFM has 4 reassuring features:
  - baseline 110–160 bpm
  - baseline variability >5 and not >25 bpm
  - accelerations present
  - no decelerations

*While normal baseline range is 110–160 bpm consider gestation during monitoring. A fetus at 40 weeks may have a lower baseline range i.e. 110 bpm which is normal; however, a fetus at 32 weeks is unlikely to have a low baseline range, and would be non-reassuring*

### Action

- Repeat according to clinical situation and degree of fetal risk

### Non-reassuring features

- Baseline 161–170 bpm or 100–109 bpm
- Accelerations absent
- Reduced variability <5 bpm for >30–50 min or >25 bpm for 5–25 min
- Any deceleration

**Abnormal features**

- Baseline <100 or >180 bpm
- Accelerations absent
- Reduced variability <5 bpm for >50 min or >25 bpm for 25 min
- Any deceleration
- Sinusoidal pattern (oscillation frequency <2–5 cycles/min, depth 2–10 bpm for >40 min with no area of normal baseline variability)

**Action**

- Review by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) and decide if delivery indicated; if in doubt, discuss with consultant obstetrician
- Consider ultrasound scan for fetal growth, depending on the clinical situation, CTG liquor volume and uterine artery Doppler studies
- Babies can also be compromised from other causes e.g. sepsis, anaemia

**Classification**

**Table 1: Categories and definition of FHR traces**

Category	Definition
Normal	All 4 features classified as reassuring
Suspicious	1 feature is non-reassuring
Pathological	≥2 non-reassuring features <b>or</b> ≥1 abnormal feature

***Do not keep repeating a non-reassuring EFM. Decide if delivery is indicated. If necessary, consultant obstetrician to review EFM***

**Dawes-Redman fetal heart rate (FHR) assessment (if local practice)**

- When starting the CTG turn on antepartum analysis and enter gestation in weeks and days
- If the CTG is suspicious/pathological obstetric review required, regardless of CTG analysis
- If a sinusoidal rhythm is present, notify middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Dawes-Redman analysis can be used for all antenatal CTG monitoring (including twin pregnancies) except when dinoprostone has been administered – see **Induction of labour** guideline

**Dawes-Redman criteria met**

- Set minimum duration of monitoring at 10 min
- Analyse CTG every 2 min until Dawes-Redman criteria met
- When criteria met a 'tick' will appear on the screen. Stop and remove CTG
- if the 'tick' is missed continue CTG until it is analysed again and Dawes-Redman criteria met (tick appears again)
- The evidence gained by the trace is that the fetus is normal and any further monitoring should be guided by other aspects of clinical assessment
- If the trace has met the criteria it is not necessary to review the short-term variation (STV) parameter

### **Dawes-Redman criteria not met**

- If insufficient evidence of normality Dawes-Redman criteria will not be met
- Continue CTG monitoring for 60 min
- at 60 min discontinue CTG; reason for not meeting criteria may be on CTG printout
- Woman to be reviewed by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Action dependent on the STV and/or reason

### **STV**

- STV is recorded on the CTG when Dawes-Redman criteria is not met; this is the best predictor of fetal wellbeing
- Valid only when measured after 60 min of CTG monitoring
- STV >4.0: hypoxia is unlikely
- >37 weeks' gestation: repeat CTG later the same day
- <37 weeks' gestation: repeat CTG the following day
- If fetal movements reduced, contact medical staff – CTG to be repeated later the same day
- If STV 3.0–3.99: repeat CTG  $\leq$  4 hr and notify middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- If STV <3.0: pre-terminal trace – notify medical staff immediately

### **Assessment of fetal movements when Dawes-Redman not met**

- If the fetal movement count <5/hr repeat CTG on same day – even if STV is normal, and regardless of gestational age
- If problem persists, instigate other tests of fetal wellbeing (ultrasound assessment of movement, umbilical arterial cord Doppler)
- **do not** rely on STV in isolation. Base ongoing care planning on an assessment of the whole clinical scenario

- While an abnormal 60 min STV is a significant risk indicator, a normal STV does not necessarily mean there is no risk of mortality or morbidity
- Consider gestational age, recording duration and clinical indication
- Normality is determined by a number of Dawes-Redman criteria, with the minimum duration of trace set at 10 min
- if criteria not met  $\leq$  60 min, end trace with the conclusion that normality has not been demonstrated
- STV value
- thresholds only valid when measured over the full period of 60 min. Always interpret results in the context of perceived fetal problem:
  - <4 msec = low
  - <3 msec = abnormal
  - <2 msec = highly abnormal

### **What to do when criteria met**

- Indicates a normal trace
- Stop CTG subject to visual assessment and clinical judgement

### **What to do when criteria not met <60 min**

- Continue trace until criteria met, unless there are clear pathological features or any cause for concern

### **What to do when criteria not met at 60 min**

- Review to be performed by, or discussed with, senior obstetrician to plan further management
- **Do not** act on the basis of CTG analysis alone, this is an aid to pregnancy management, not a diagnostic tool

**Using a computerised CTG does not replace a clinical assessment and interpretation of CTG**

### RECORDING AND DOCUMENTATION

- **Machine:** set speed 1 cm/min, set date and time, ensure identification, ensure adequate quality of FHR and uterine contraction recordings and improve quality with necessary adjustment
- if there are artefacts, change machine
- ensure setting in multiple pregnancy
- Ensure the following are recorded on EFM trace:
  - date, time and signature of midwife at commencement of trace
  - **maternal details:** label name, hospital number, pulse rate, date and time
  - **fetal heart rate:** auscultation
  - **events:** note any events on trace during monitoring e.g vaginal examination, FBS
  - **opinion:** add comment on EFM trace e.g. 'normal', 'suspicious', 'pathological' with date time and signature
  - **completion:** sign again, enter name, date, time and mode of delivery
- **Storage:** follow local practice for storing trace
- Document plan in maternal healthcare record

## AIM

Recognition and prevention of potential fetal acidosis in labour

## Indications for EFM

### Maternal

- Hypertensive disorders
- Antepartum haemorrhage
- Trauma/RTC
- Abdominal pain/unwell
- Maternal pulse >120 bpm on 2 occasions 30 min apart
- Temperature  $\geq 38^{\circ}\text{C}$  on a single reading or  $37.5^{\circ}\text{C}$  on 2 consecutive occasions 1 hr apart
- Suspected chorioamnionitis or sepsis
- Previous caesarean section/uterine rupture
- Preterm PROM
- Induced labour where more than a single dose of prostaglandin has been required
- Diabetes
- Recurrent antepartum haemorrhage
- Maternal medical disease that may increase risk to fetus e.g. significant cardiac disease, renal disease. If unsure, discuss with middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Antiphospholipid antibody syndrome
- Obstetric cholestasis
- Previous stillbirth
- Obesity (BMI  $\geq 40$ )

### Fetal

- Confirmed or suspected intrauterine growth restriction
- Abnormal Doppler
- Oligohydramnios/polyhydramnios
- Iso-immunisation
- Significant meconium stained liquor (see **Meconium stained liquor** guideline)

- Abnormal FHR on auscultation:
  - baseline abnormality <110 bpm >180 bpm, decelerations after a contraction
- Postmaturity (>42<sup>+0</sup> weeks' gestation)
- Multiple pregnancy
- Abnormal lie/presentation
- 2 episodes of reduced fetal movements in a 1 month period >28 weeks' gestation, and/or reduced fetal movements in previous 24 hr
- Non-reassuring or abnormal EFM trace antenatally especially if performed for reduced fetal movements

### Intrapartum

- Prolonged membrane rupture interval (>24 hr) before onset of established labour
- Pain not associated with contractions
- Oxytocin augmentation
- Epidural anaesthesia
- Fresh vaginal bleeding in labour
- Delay in first or second stage of labour
- Instrumental birth
- Preterm labour (<37<sup>+0</sup> weeks' gestation)

### How to monitor

- Perform abdominal examination
- Listen to fetal heart with a Pinard stethoscope or handheld Doppler before commencing EFM
- Palpate maternal pulse simultaneously to differentiate fetal and maternal heart rate

### Overall care

- When CTG commenced due to concerns from intermittent auscultation, if after 20 min there are no non-reassuring or abnormal features and CTG categorised as normal, return to intermittent auscultation after discussion with the woman

- Take into account the woman's preferences, any antenatal and intrapartum risk factors, current wellbeing of the woman and unborn baby and progress of labour
- Ensure focus of care remains on the woman rather than CTG trace
- Remain with the woman in order to continue providing one-to-one support
- Talk to the woman and her birth companion(s) about what is happening and take her preferences into account

### Principles for intrapartum CTG trace interpretation

- Do not make any decisions about a woman's care in labour on the basis of CTG findings alone
- When reviewing CTG trace, assess and document contractions and all 4 features of fetal heart rate (FHR): baseline rate; baseline variability; presence or absence of decelerations (and concerning characteristics of variable decelerations if present)
- An increase in baseline heart rate, even within normal range, with other non-reassuring or abnormal features should increase concern
- Although a baseline fetal heart rate is 100–109 bpm is a non-reassuring feature, continue usual care if there is **normal baseline variability and no variable or late decelerations**
- If it is difficult to categorise or interpret CTG trace, obtain review by senior midwife or ST3–7 or equivalent (e.g. staff grade, clinical fellow)
- in the event of disagreement regarding CTG classification refer to consultant obstetrician

### MATERNAL CHOICE FOR FETAL MONITORING

- Respect the woman's choice of fetal monitoring
- Explain risks and benefits of fetal monitoring in labour
- Clearly document discussion and explanation of risks and benefits in maternal healthcare record

Table 1: Description of CTG trace features

Description	Baseline (bpm)	Variability (bpm)	Deceleration	Acceleration
Reassuring	● 110–160	● 5–25	<ul style="list-style-type: none"> <li>● None/early</li> <li>● Variable decelerations without any concerning characteristics for &lt;90 min</li> </ul>	<ul style="list-style-type: none"> <li>● Present</li> <li>● Record accelerations if heard</li> </ul>
Non-reassuring	<ul style="list-style-type: none"> <li>● 100–109 or</li> <li>● 161–180</li> </ul>	<ul style="list-style-type: none"> <li>● &lt;5 for 30–50 min or</li> <li>● &gt;25 for 15–25 min</li> </ul>	<ul style="list-style-type: none"> <li>● Variable decelerations with no concerning characteristics for ≥90 min</li> <li>● Variable decelerations with any concerning characteristics in &lt;50% of contractions for ≥30 min</li> <li>● Variable decelerations with any concerning characteristics in &gt;50% of contractions for &lt;30 min or</li> <li>● Late decelerations in &gt;50% of contractions for &lt;30 min with no maternal or fetal clinical risk factors (e.g. vaginal bleeding or significant meconium)</li> </ul>	<ul style="list-style-type: none"> <li>● Absence of accelerations on an otherwise normal CTG trace does not indicate fetal acidosis</li> </ul>
Abnormal	<ul style="list-style-type: none"> <li>● &lt;100 or</li> <li>● &gt;180</li> </ul>	<ul style="list-style-type: none"> <li>● &lt;5 for &gt;50 min or</li> <li>● &gt;25 for &gt;25 min or</li> <li>● Sinusoidal</li> </ul>	<ul style="list-style-type: none"> <li>● Variable decelerations with any concerning characteristics in &gt;50% of contractions for 30 min or</li> <li>● Late decelerations for 30 min</li> <li>● Act sooner than 30 min if any maternal/fetal clinical risk factors (e.g. vaginal bleeding/significant meconium) or</li> <li>● Acute bradycardia, or single prolonged deceleration lasting ≥3 min</li> </ul>	

**ACCELERATIONS**

- The presence of FHR accelerations, even with reduced baseline variability, is generally a sign baby is healthy

*Accelerations coinciding with uterine contractions, especially in second stage of labour, suggest possible erroneous recording of the maternal heart rate. Fetal heart more frequently decelerates with a contraction*

- how long they have been present for
- whether they occur with >50% of contractions
- presence/absence of biphasic (W) shape
- presence/absence of shouldering
- presence/absence of reduced variability within the deceleration

**Early**

- True early uniform decelerations are rare and benign, and not significant, most decelerations in labour are variable

**DECCELERATIONS**

- Describe decelerations as ‘early’, ‘variable’ or ‘late’
- When describing decelerations in fetal heart, specify:
  - timing in relation to peaks of the contraction
  - duration of individual decelerations
  - whether or not FHR returns to baseline

**Variable**

- Regard the following as **concerning** characteristics:
  - lasting >60 sec
  - reduced variability within the deceleration
  - biphasic (W) shape
  - no shouldering

Table 2: Management based on interpretation of CTG

Category	Definition	Interpretation	Management
<b>Normal</b>	<ul style="list-style-type: none"> <li>● All features normal</li> </ul>	<ul style="list-style-type: none"> <li>● Fetus with no probability of hypoxia/acidosis</li> </ul>	<ul style="list-style-type: none"> <li>● Continue CTG</li> <li>● If CTG commenced due to concerns arising from intermittent auscultation, remove CTG after 20 min if there are no non-reassuring or abnormal features and no ongoing risk factors</li> <li>● Talk to woman and her birth partner(s) about what is happening</li> </ul>
<b>Suspicious</b>	<ul style="list-style-type: none"> <li>● 1 non-reassuring feature <b>and</b></li> <li>● 2 reassuring features</li> </ul>	<ul style="list-style-type: none"> <li>● Fetus with low probability of hypoxia/acidosis</li> </ul>	<ul style="list-style-type: none"> <li>● Correct any underlying causes, such as hypotension or uterine hyperstimulation</li> <li>● Perform FULL set of maternal observations</li> <li>● Start ≥1 conservative measure</li> <li>● Inform senior midwife or obstetrician</li> <li>● Document plan for reviewing whole clinical picture and CTG findings</li> <li>● Talk to woman and her birth partner(s) about what is happening and take her preferences into account</li> </ul>
<b>Pathological</b>	<ul style="list-style-type: none"> <li>● 1 abnormal feature <b>or</b></li> <li>● 2 non-reassuring features</li> </ul>	<ul style="list-style-type: none"> <li>● Fetus with high probability of hypoxia/acidosis</li> </ul>	<ul style="list-style-type: none"> <li>● Obtain review by senior midwife or obstetrician</li> <li>● Exclude acute events (e.g. cord prolapse, suspected placental abruption or uterine rupture)</li> <li>● Correct any underlying causes, e.g. hypotension or uterine hyperstimulation</li> <li>● Start ≥1 conservative measure</li> <li>● Talk to woman and her birth partner(s) about what is happening and take her preferences into account</li> <li>● If CTG trace still pathological after implementing conservative measures obtain further review by senior midwife and obstetrician</li> <li>● offer digital scalp stimulation and take woman's preferences into account</li> <li>● If CTG trace still pathological after fetal scalp stimulation, consider fetal blood sampling/expediting the birth, and take woman's preferences into account</li> </ul>

Table 2: Management based on interpretation of CTG *cont.*

Category	Definition	Interpretation	Management
<b>Need for urgent intervention</b>	<ul style="list-style-type: none"> <li>● Acute bradycardia, or a single prolonged deceleration for <math>\geq 3</math> min</li> </ul>	<ul style="list-style-type: none"> <li>● Fetus with a high probability of having hypoxia/acidosis</li> </ul>	<ul style="list-style-type: none"> <li>● Urgently seek obstetric help</li> <li>● If there has been an acute event (e.g. cord prolapse, suspected placental abruption or uterine rupture) expedite the birth</li> <li>● Correct any underlying causes, e.g. hypotension or uterine hyperstimulation</li> <li>● Start <math>\geq 1</math> conservative measure</li> <li>● Make preparations for urgent birth</li> <li>● Talk to woman and her birth partner(s) about what is happening and take her preferences into account</li> <li>● Expedite birth if acute bradycardia persists for 9 min</li> <li>● If FHR recovers at any time <math>\leq 9</math> min, reassess decision to expedite birth in discussion with woman</li> </ul>

## INTERPRETATIONS AND ACTIONS

### Frequency of assessment

- Undertake systematic assessment every hour to categorise CTG trace based on classification in **Table 1**
- if concerns about CTG findings, undertake assessment more frequently
- 'Fresh Eyes' according to local practice
- Document findings as per local practice

### Conservative measures

- If there are any concerns about baby's wellbeing, be aware of possible underlying causes
- Inform senior midwife or obstetrician whenever conservative measures are implemented
- Encourage the woman to mobilise or adopt an alternative position (and to avoid being supine)
- Offer intravenous fluids if woman is hypotensive

- Reduce contraction frequency by:
  - reducing or stopping oxytocin if it is being used and/or
  - offering tocolytic drug [e.g. subcutaneous terbutaline 0.25 mg (unlicensed)]

### Inadequate quality

- Check maternal pulse
  - use pulse oximetry to record maternal pulse
- Check position of transducer or fetal scalp electrode
- Unless contraindicated (e.g. prematurity  $< 34$  weeks, hepatitis B or C, HIV, malpresentation, fetal bleeding disorders, maternal ITP), consider applying fetal scalp electrode

### Fetal scalp stimulation and fetal blood sampling (FBS)

- If CTG trace is pathological offer digital fetal scalp stimulation
- if this leads to an acceleration in FHR, only continue/consider FBS if the CTG trace is still pathological – see **Fetal blood sampling** guideline
- If digital scalp stimulation (during vaginal examination) leads to an acceleration in FHR, regard this as a sign that the baby is healthy

### RECORDING AND DOCUMENTATION

- **Machine:** set speed 1 cm/min, set date and time, ensure identification, ensure adequate quality of FHR and uterine contraction recordings and improve quality with necessary adjustment
- if there are artefacts, change machine
- ensure setting in multiple pregnancy mode
- Ensure the following are recorded on EFM trace:
  - date, time and signature of midwife at commencement of trace
  - **maternal:** label name, hospital number, pulse rate, date and time
  - **fetal:** auscultation
  - **events:** note any events on trace during monitoring e.g. vaginal examination, FBS
  - **opinion:** add comment on CTG trace e.g. normal, suspicious, or pathological with date time and signature
  - **completion:** sign again, enter name, date, time and mode of delivery
- **Storage:** follow local practice for storing trace

## INTRODUCTION

Epidural analgesia is the most effective method of pain relief in labour. If epidural analgesia is available on a 24 hr basis, time from informing anaesthetist until he/she is able to attend should ideally not exceed 30 min. Discuss the following risks and benefits with the mother:

- Reduced neonatal respiratory depression (repeat doses of IM opioids)
- Improved uteroplacental blood flow in the compromised fetus
- Assists with controlled birth (e.g. breech or multiple pregnancy)
- Can be used as regional anaesthesia if required

## If delay anticipated

- Review necessity of epidural: purely analgesic or medical indication
- If only for analgesia, midwife to discuss alternative form of pain relief (remifentanyl PCA) with the woman until epidural service is available
- Document 'exceptional circumstances', cause of delay and discussion with woman in maternal healthcare record. Involve on-call consultant anaesthetist in the discussion

## INDICATIONS

- Maternal request
- Obstetric indications (e.g. pre-eclampsia, breech, multiple pregnancies, prolonged labour)
- Medical indication (CVS and respiratory diseases, etc.)
- Morbid obesity

## CONTRAINDICATIONS

### Absolute

- Patient refusal
- Local or systemic sepsis
- Known hypersensitivity to local anaesthetic drugs
- Coagulopathy – see **Investigations**

- Raised intracranial pressure
- Inadequately trained or competency assessed staff

## Anticoagulant therapy

- Do not insert epidural:
  - for  $\geq 12$  hr after last prophylactic dose
  - for  $\geq 24$  hr after last therapeutic dose

## Relative

### Discuss with consultant obstetric anaesthetist

- Neurological disorders (spinal bifida occulta)
- Significant cardiac disease
- Anatomical deformity or back surgery
- Haemorrhage, hypovolaemia

## PREPARATION

### Patient

- Explain technique, and risks and benefits
- Provide information leaflet if available locally
- Obtain and document verbal consent
- Obtain IV access

## Investigations

- In pre-eclamptic women, check FBC. If platelet count  $< 100,000$  – APPT, INR
- Intra-uterine death  $> 1$  week: detailed coagulation profile, including D-dimer and fibrinogen levels
- In septic woman: FBC and CRP

## Equipment

- Oxygen and suction available
- Epidural trolley with:
  - epidural pack (16 G/18 G Tuohy needle) or 19 G/23 G catheter
  - yellow epidural infusion lines labelled with yellow label from pack
  - sterile gown, gloves, hat and mask
  - chlorhexidine skin preparation 0.5%
- Use specific epidural pumps with locking ability

### Optional equipment

- CSE pack/spinal needles 25 G

### Drugs

- Lidocaine 1%
- Standard mixture (bupivacaine 0.1% with fentanyl 2 microgram/mL) or a bag of bupivacaine 0.1% and fentanyl ampoule for mixture preparation
- Levobupivacaine (0.25 and 0.5%) (for bolus administration in second stage of labour)
- Vasopressors
- Sodium chloride 0.9%

### INSERTION OF EPIDURAL

- Use full aseptic technique wearing gloves, gown, hat and mask
- Clean insertion site with alcoholic chlorhexidine gluconate solution and allow to **air dry**
- Evidence suggests that loss of resistance to sodium chloride 0.9% is a better technique than loss of resistance to air
- If technical difficulty, seek help early or consider alternative analgesia e.g. remifentanyl PCA

### ESTABLISHING AND MAINTAINING EPIDURAL ANALGESIA

#### Accepted regimens:

1. Continuous infusion
2. Patient controlled epidural analgesia (PCEA)
3. Bolus administration PRN

#### Drug used for all 3 procedures

- Mixtures of low concentration of local anaesthetic (e.g. bupivacaine 0.1% or levobupivacaine) with an opiate (e.g. fentanyl 2 microgram/mL), as per local Trust protocol

### Test dose for all epidural procedures

- Administer a test dose of 5 mL from the epidural solution
- Wait for 5 min to check for rapid onset of sensory changes and significant decrease in blood pressure

### Procedures for establishing analgesia in labour

#### 1. Procedure for continuous infusion of dilute mix of local anaesthetic and opioid

- After verification of correct catheter placement, administer loading dose (usually 10–15 mL of the mixture), then:
  - commence an infusion rate of 10–12 mL/hr for maintenance
  - rate may be increased up to 15 mL/hr and rescue analgesia may be provided by a single bolus of 10 mL of the infusion mixture. Can be administered by midwife via pump

#### 2. Procedure for use of PCEA

- Anaesthetist will set up the machine
- Administer the first 10 mL bolus dose of mixture
- Set patient administered bolus of 10 mL infusion. Set a bolus lockout of 20 min or as per local protocol
- Commence a background infusion rate of 0–5 mL/hr of the mixture
- **Do not give** first patient administered dose before 30 min after first therapeutic dose
- **Do not give PCEA handset to woman until 30 min after infusion commenced**
- if pain relief remains ineffective after 2 boluses, request duty anaesthetist to assess woman

### 3. Procedure for bolus epidural top-up

- Anaesthetist will administer first bolus dose of epidural (10–15 mL of the drug mixture) after the test dose
- Subsequent boluses are 10 mL of mixture administered by either midwife or anaesthetist

#### Top-up by midwife

- Midwife will check each prescribed top-up (10 mL of drug mixture) with another qualified professional before administering. Following administration, both will sign and record on regional anaesthesia chart or as per Trust policy

### INTRAPARTUM CARE

- **Monitor:**
  - pulse, blood pressure, respiratory rate, sensory, motor block and conscious level – as per local practice
  - woman's temperature rises to 37.5–38°C with epidural (0.33°/hr) – maternal and fetal implications of this are still unclear
- Maintain venous access for as long as epidural analgesia is maintained
- Continuous electronic fetal monitoring when receiving epidural blockade throughout labour

***If there are concerns for fetal wellbeing at any stage, abandon the procedure until a proper assessment of fetal status is made***

#### Positioning

- To reduce the risk of hypotension, do not allow woman to lie flat on her back
- For pressure care encourage woman to change position regularly

#### Mobility

- Assess ability to ambulate 20–30 min after initial injection:
  - ability to raise each leg from bed for ≥5 sec
  - ask if she feels capable of weight-bearing

#### Before weight-bearing

- Other requirements to be satisfied include:
  - no postural hypotension
  - co-operative woman
- A partner and/or midwife must be available at all times to accompany woman while mobilising

#### Bladder care

- Epidural analgesia may make passing urine difficult and woman may not be aware of a full bladder. Encourage her to void her bladder every 2–4 hr. See **Bladder care** guideline

#### Diet and fluids

- Acceptable drinks include water, tea, coffee, squash and non-fizzy isotonic sports glucose
- Oral ranitidine 150 mg every 6–8 hr while in labour

#### Epidural management during second and third stage of labour

- Do not withhold epidural analgesia in second stage
- Usual top-up dose for second stage of labour is 10 mL levobupivacaine 0.25% via epidural catheter. Do not leave woman unattended for 20–30 min after bolus
- Maintain epidural analgesia until perineal suturing has been performed

#### An anaesthetist must give top-ups in the following situations

- Midwife is concerned about level of block
- An unusual prescription has been ordered
- A hypotensive episode (systolic blood pressure <100 mmHg) after previous top-up
- Analgesia is persistently inadequate
- To extend the block for caesarean section
- After suspected dural tap and with intrathecal catheter *in situ*

### HIGH CONCENTRATION TOP-UPS

**Caution:** *This type of epidural top-up has a higher rate of hypotension, significant intravascular injection, difficulty in pushing and instrumental delivery*

#### Indications

- Has a role in managing inadequate analgesia (OP position), premature desire to push and instrumental delivery

#### Administration

- Requires levobupivacaine 0.25% or lidocaine 2% (dose dependent on circumstances and anaesthetist assessment) with or without 100 microgram fentanyl
- Care for woman on bed and encourage to change position regularly

### EPIDURAL CATHETER REMOVAL

- **Do not** remove for  $\geq 12$  hr after prophylactic and 24 hr of therapeutic LMWH administration
- In severe PET and after a massive bleed, ensure normal FBC and clotting profile before removal
- Unless otherwise directed by anaesthetist, remove just before discharge back to ward
- Pull firmly on catheter, but **do not** use excessive force – catheter should come out easily with minimal resistance. If not, seek senior or consultant anaesthetist's advice
- Remove catheter and check blue tip is complete
- Document removal of catheter and whether tip intact
- Inform anaesthetist of any problems

### TRANSFER BACK TO WARD

- Before transferring to ward, midwife should ensure:
- vital signs are normal

- adequate return of motor power to legs and document – if not, contact anaesthetist

### COMPLICATIONS AND MANAGEMENT

#### Managing incomplete analgesia

##### Incomplete block

- Check – has the catheter fallen out? Leak/disconnection?
- Try bolus of standard mix or stronger solution as indicated

##### Unilateral block

- Anaesthetist may consider pulling catheter back 1–2 cm and try another dose with the painful side dependent. Optimum is 3–4 cm of catheter in epidural space
- If still not effective, consider resiting epidural

##### Missed segment, patchy block

- Try using 5 mL levobupivacaine 0.25%
- If block patchy and high, consider possibility of a subdural block – see **Accidental dural puncture** below
- If still not effective, consider resiting epidural

##### Perineal pain

- Give bolus of 10 mL infusion mixture
- If pain persists, try topping up with 50–100 microgram fentanyl in 8–10 mL levobupivacaine 0.25%
- If inadequate analgesia after bolus, anaesthetist to review

##### Breakthrough pain through a good block

- Consider uterine rupture or abruption
- Assess woman and progress of labour

**If inadequate analgesia after 1 or 2 top-ups and woman still unhappy, anaesthetist to review in person, resite or seek senior help**

## Pruritus

- If of sufficient severity to warrant treatment, administer one dose of naloxone 40 microgram IV
- Alternatively, consider chlorpheniramine (Piriton®) 4 mg oral or 10 mg IM

## Accidental dural tap

- Incidence of dural puncture whilst siting an epidural is 1–2%
- Overall incidence of post dural puncture headache (PDPH) following inadvertent dural puncture is 75%

## If recognised at time of insertion

- Leave catheter intrathecally for at least 24 hr or resite
- Label clearly as a spinal/intrathecal catheter
- Give 1 mL bupivacaine 0.25% with fentanyl 25 microgram. Alternatively, use 2 mL of the infusion mixture. Flush with 2 mL sodium chloride 0.9% after every top-up
- Subsequent boluses must be 2 mL of the infusion mixture administered by anaesthetist only

## Monitor

- Regular BP (timing according to local practice)
- Keep vasopressors handy
- Keep woman on labour ward until catheter removed

***If intrathecal catheter placement difficult, seek senior help or provide alternative methods of analgesia e.g. remifentanyl PCA***

## Follow-up after dural puncture

- Anaesthetist to discuss dural puncture management with woman
- assess for symptoms of PDPH and treatment options available with attendant risks and benefits

- Provide information leaflet (if available locally)
- Ensure details recorded in audit book or according to local practice
- Offer postnatal anaesthetic clinic appointment if available locally
- Notify GP

## MANAGING SERIOUS COMPLICATIONS

### Total spinal and unanticipated high block

- Can occur after first dose of epidural or any time during labour
- Monitor as per local protocol

### *It is an acute emergency, characterised by:*

- Rapidly progressive sensory and motor block of legs and arms
- Severe hypotension and bradycardia
- Reduced or absent respiration
- Altered level of consciousness

## Management

- Call for help – including an anaesthetist
- Relieve aortocaval compression by left lateral displacement of the uterus – manually or with a wedge
- If CPR not required, full lateral position
- Use ABC approach
- Administer 100% oxygen and, if respiration inadequate or woman has lost consciousness, be ready to intubate
- Cardiovascular support in the form of fluids, vasopressors (phenylephrine, ephedrine, adrenaline)
- In case of cardiac arrest or severe cardiac depression, initiate CPR – see **Maternal collapse algorithm** in **Collapse** guideline
- If no return of spontaneous circulation, consider peri-mortem caesarean section within 5 min
- After successful resuscitation, woman must be managed by on-call consultant anaesthetist (if not already there)

**Intravascular injection of local anaesthesia**

- Arises as a result of incorrect site of administration (IV) or incorrect dose administered

**Symptoms and signs**

- Peri-oral numbness, difficulty speaking
- Tinnitus
- Dizziness
- Restlessness
- Dysrhythmia (bradycardia, VT and VF)
- Hypotension
- Convulsions
- Loss of consciousness

**Immediate management**

- **Stop injecting drug**
- Commence resuscitation, all principles of basic and advanced life support apply
- Summon help immediately including anaesthetist if not present
- If lateral tilt of 15–30° cannot be applied, manually displace uterus
- Give benzodiazepine, thiopental or propofol in small incremental doses to control seizures
- Bag-mask ventilate with 100% oxygen before intubation
- Perform caesarean section

**Use of 20% Intralipid®**

- Early use of Intralipid® 20% 1.5 mL/kg IV over 1 min, followed by an infusion of 15 mL/kg/hr
- **After 5 min**, give **maximum of 2** repeat boluses (same dose) if:
- CVS stability is not achieved or adequate circulation deteriorates
- Leave **5 min** between boluses
- maximum of **3** boluses can be given (including the initial bolus), followed by infusion dose to 30 mL/kg/hr

- Continue infusion until stable and adequate circulation restored or maximum dose of lipid emulsion given
- Recovery after a cardiac arrest will take > 1 hr
- Consider drawing blood for analysis

**Do not exceed a maximum cumulative Intralipid® dose of 12 mL/kg**

## DEFINITION

A surgical incision of the perineum to increase the diameter of the vulval outlet during childbirth to facilitate delivery but minimise harm to mother and baby

**Perform mediolateral episiotomy only**

## Mediolateral episiotomy

- Cut starts at centre of the vaginal fourchette and directed to the right side at an angle of 60° to the vertical axis (see diagram below)

## INDICATIONS

The list below is not exhaustive – use clinical judgement on an individual basis

- Fetal distress
- Maternal reason to expedite delivery (e.g. pre-eclampsia/eclampsia)
- Rigid perineum preventing delivery
- Instrumental delivery (particularly forceps)
- Occipitoposterior position (OP)
- Shoulder dystocia
- Breech presentation

## Equipment

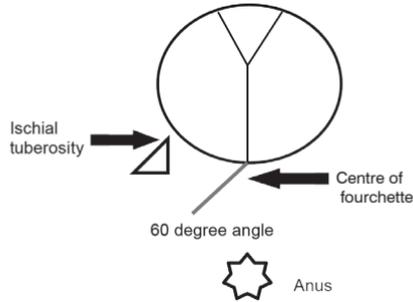
- Sterile or tap water to clean area before procedure
- 1 x 10 mL syringe
- 1 x 22 gauge (green) infiltration needle
- 10 mL lidocaine 1%
- Mayo episiotomy scissors

## Consent

- Reassure woman and partner
- Explain procedure and indications
- Obtain and record consent

## PROCEDURE

***This procedure must only be performed by appropriately trained practitioners or under direct supervision of a mentor***



## Position and preparation of woman

- Place in comfortable legs-open position
- Cleanse perineal area using aseptic technique
- Place index and middle fingers into vagina between presenting part and perineum
- Insert needle fully into perineal tissue starting at centre of fourchette and direct it midway between ischial tuberosity and anus (protect fetal head)
- Draw back plunger of syringe before injecting 5–10 mL lidocaine 1% slowly as needle is withdrawn

## Episiotomy incision

- Insert middle and index fingers into vagina and gently pull perineum away from fetal part to protect fetal head
- Perform incision when presenting part has distended perineum
- Insert open scissors between 2 fingers and make incision in 1 single straight cut to minimise damage and allow/facilitate optimal realignment
- begin at the centre of the fourchette and extend 4 cm in a right mediolateral direction midway between the ischial tuberosity and anus, ideally at a 60° angle to vertical axis

## EPISIOTOMY • 2/2

- Withdraw scissors carefully
- Control delivery of the presenting part and shoulders to avoid extension
- If delay in delivery, apply pressure to episiotomy between contractions to control bleeding
- After third stage, with informed consent, thoroughly inspect vagina, perineum and rectum to ascertain extent of trauma prior to repair in the appropriate setting

### COMPLICATIONS

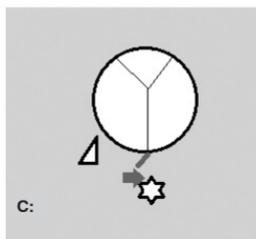
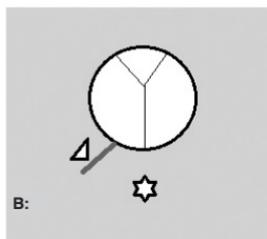
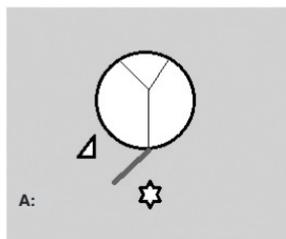


Figure A	Figure B	Figure C
<b>Correct anatomical position</b>	<b>Incorrect</b> <ul style="list-style-type: none"><li>● Cut begins lateral to the centre of the fourchette</li><li>● Will not increase diameter of vulval outlet</li><li>● Will cause damage to bartholins gland</li><li>● Will affect lubrication and may cause complications e.g. dyspareunia</li></ul>	<b>Incorrect</b> <ul style="list-style-type: none"><li>● Cut is too small resulting in extension of incision towards the anus and increasing risk of anal sphincter injury</li></ul>

### Suturing

See **Third and fourth degree perineal tears – OASIS guideline** and **Perineal trauma suturing (tears and episiotomy) guideline**

### Pain management

See **Perineal trauma suturing (tears and episiotomy) guideline**

### Discharge and follow-up

See **Perineal trauma suturing (tears and episiotomy) guideline**

**INTRODUCTION**

- Management of babies born at the threshold of viability presents some of the most testing ethical and clinical problems
- If it seems likely that delivery will occur at an extremely premature gestation, there may be a variable amount of time to counsel and prepare woman and partner for the outcome
- Unless circumstances dictate otherwise, senior staff should always be involved
- Document all information given to parents in the maternal healthcare record

**Table 1**

<b>Gestation</b>	<b>Senior neonatologist to counsel</b>	<b>Neonatal middle grade* or consultant at delivery</b>	<b>Electronic fetal monitoring</b>	<b>Caesarean section (CS) indicated</b>	<b>CS indicated if breech/ non-cephalic</b>
<22 weeks	No	No	No	Not for fetal indications	No
22–22 <sup>+6</sup> weeks	Yes, if parents request	No	No	Not for fetal indications	No
23–23 <sup>+6</sup> weeks	Yes	Yes	No	Not for fetal indications	No
24–24 <sup>+6</sup> weeks	Yes Parents visit NNU if possible	Yes	Fetal heart auscultated 2 <sup>nd</sup> stage	Not for fetal indications	No
25–25 <sup>+6</sup> weeks	Yes Parents visit NNU if possible	Yes	Yes	<b>May</b> be justifiable for fetal indications	No
26–26 <sup>+6</sup> weeks	Yes Parents visit NNU if possible	Yes	Yes	Indicated for fetal compromise	Uncertain
27–27 <sup>+6</sup> weeks	Yes Parents visit NNU if possible	Yes	Yes	Indicated for fetal compromise	Uncertain
28 weeks	Yes Parents visit NNU if possible	Yes	Yes	Indicated for fetal compromise	Advise CS

\* ST3–7 or equivalent e.g. staff grade, clinical fellow

***These are guidelines only***

***An alternative management plan, based on individual circumstances, can be made by a middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant***

***Record management plan clearly in maternal healthcare record and ensure it is accessible to all staff***

## OBSTETRIC RESPONSIBILITIES

### Calculating gestational age

- Management of extreme prematurity depends on gestation. Knowledge of precise gestation is important, preferably calculated from an ultrasound scan at 9–14 weeks
- Dating scans are accurate within 1 week below 14 weeks. However, even at 20 weeks they are accurate to within one-and-a-half weeks
- If only late ultrasound scan is available, use best estimate gestation to determine management
- If estimated gestation is  $\geq 23$  weeks and fetal heart is audible before delivery, a neonatologist experienced in resuscitation to attend birth

### Counselling

- Middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant to provide patient information leaflet (if available) and counsel mother addressing the following questions:
  - how sick is baby now
  - how sick is baby likely to be at birth
  - is baby likely to die or survive
- Use EPICure data (see **Tables 2 and 3**)
- Discuss the role of operative delivery (risks and benefits) and the use of fetal monitoring with woman and family and take their views into account

### Electronic fetal monitoring (EFM)

- Perform EFM **only** if it has been agreed with parents after discussion that an emergency CS would be performed for a pathological EFM
- It is often difficult to monitor a fetus <28 weeks' gestation
- If an adequate trace cannot be obtained, baby's wellbeing is not being monitored

- as a minimum, a middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) must discuss with parents whether to deliver or continue labour without monitoring
- document discussion and decision in maternal healthcare record

### Antenatal steroids

- Decision to give betamethasone to improve fetal lung maturity <24 weeks' gestation must be discussed with consultant obstetrician

### MAGNESIUM SULPHATE

- Magnesium sulphate protects premature babies' brains from cerebral palsy. Consider for all babies <30 weeks' gestation likely to deliver in  $\leq 24$  hr regardless of mode of delivery
- Can be given to women with multiple pregnancy and irrespective of whether steroids have been given
- ideally, commence infusion 4 hr before delivery, but there may still be benefit if given <4 hr before delivery but do not delay delivery in time-critical situations e.g. fetal distress
- administration may be impractical when delivery is imminent. Consultant obstetrician will decide whether to administer

### Side effects

- Inform woman about the possibility of side effects. The most common are:
  - facial flushing
  - nausea and vomiting
  - sweating
- Tachycardia and hypotension have also been observed
- The effect may be more pronounced when magnesium sulphate is given with calcium channel blockers e.g. nifedipine

**Dosage**

- Give loading dose of 4 g (8 mL) IV over 20 min
- mix 4 g (8 mL) magnesium sulphate 50% with 12 mL sodium chloride 0.9% (total 20 mL) and set syringe driver at 60 mL/hr
- Give maintenance dose of 1 g/hr IV via syringe pump until delivery or for 24 hr, whichever is sooner
- mix 5 g (10 mL) magnesium sulphate 50% with 40 mL sodium chloride 0.9% (total 50 mL) and set syringe driver at 10 mL/hr
- If woman did not deliver as expected, a repeat dose can be given later in the pregnancy

**Observations and monitoring**

- Commence hourly observations of:
  - respiratory rate
  - level of consciousness
- Check deep tendon reflexes regularly (according to local practice). In general, use patella tendon reflexes, use reflexes at elbow or wrist in women who have a working epidural *in situ*
- Check reflexes more often when:
  - there is oliguria
  - woman is also taking nifedipine
  - magnesium sulphate dosage has required adjustment
- Monitor oxygen saturation continuously with pulse oximeter. Stop infusion immediately and call middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) if:
  - tendon reflexes absent
  - respirations <12/min
  - SpO<sub>2</sub> <96%
  - abnormal conscious level
  - urine output <1.5 mL/kg over 4 hr

**Antidote**

- Calcium gluconate 1 g (10 mL 10% solution) IV over 3 min

**NEONATAL RESPONSIBILITIES**

- Wherever possible, inform neonatal team of woman's admission to delivery suite
- If appropriate, neonatologist will review woman and discuss care of baby following delivery
- Counselling provided by a senior neonatologist, depending on gestation (see **Table 1**), should include the role of resuscitation, use of cardiac drugs and risks and benefits
- Use EPICure research study data to give a percentage for survival and risk of disability (see **Tables 2 and 3**). Local data may also be useful

**Neonatal resuscitation**

**Certain gestation of <22<sup>+0</sup> weeks**

- Advise parents that survival is not possible

**Certain gestation of 22<sup>+0</sup>–22<sup>+6</sup> weeks**

- Advise parents that survival is extremely rare (see EPICure data) and it would be in baby's best interests, and standard practice, not to resuscitate

**Certain gestation of 23<sup>+0</sup>–23<sup>+6</sup> weeks**

- Decision **not** to start resuscitation may be appropriate, particularly if parents have expressed this wish
- If resuscitation is started, initiate mask ventilation and observe heart rate response
- if there is a very rapid improvement, intubation, stabilisation and transfer to NNU is appropriate
- There is no evidence to support the use of chest compression or epinephrine in babies <25 weeks

**Certain gestation of 24<sup>+0</sup>-24<sup>+6</sup> weeks**

- Unless parents and clinicians have considered baby will be born severely compromised, start resuscitation
- Initiate mask ventilation and observe baby's heart rate. If there is a very rapid improvement, intubate, stabilise and transfer to NNU
- There is no evidence to support the use of chest compressions or epinephrine in babies <25 weeks

**Certain gestation of 25<sup>+0</sup>-25<sup>+6</sup> weeks**

- Start resuscitation
- Initiate mask ventilation and observe heart rate response. If there is a very rapid improvement, intubate, stabilise and transfer to NNU
- If appropriate, initiate chest compressions and epinephrine – follow NLS guidelines and **Cardiopulmonary resuscitation of the newborn** guideline

**Certain gestation of ≥26<sup>+0</sup> weeks**

- Advise parents that survival at this gestation is usual
- It is considered good practice to offer parents the opportunity to raise questions regarding care of the newborn with a member of the neonatal team. Include a visit to the NNU if feasible
- If complications anticipated e.g. known congenital anomaly, provide counselling by a senior member of the neonatal team (who should document the discussion in the woman's healthcare record)

**EPICURE STUDIES OF SURVIVAL AND DISABILITY**

**Table 2: EPICure 2 study – Survival and disability**

Completed weeks of gestation		22	23	24	25	26
Survival to discharge as % live births	%	1	15	36	62	75
Survival to discharge as % babies admitted to NICU	%	16	29	46	69	78
Survival without disability at 3 years	%	1	15	36	43	59
Survival without disability of those admitted to NICU	%	5	15	28	47	61

**Table 3: Factors affecting chance of survival**

Increase	Decrease
Female sex	Prolonged membrane rupture interval
Birth weight 50–85 <sup>th</sup> centile	Sepsis
Birth weight >600 g	Birth weight <500 g
Delivery in unit with level 3 NICU	Abnormal umbilical artery Doppler flow

### COMMUNICATION WITH PARENTS

- Dependent upon labour timescales etc., a second counselling session may be useful
- Following discussion, parents should be aware of the options, their risks, benefits and the implications of alternatives
- Reinforce verbal information by providing printed leaflets (if available). Give details of support services available e.g. bereavement counselling and BLISS information (<http://www.bliss.org.uk/shop>)
- When talking to parents, survival outcomes may need to be modified in light of clinical information available see **Table 3**
- The RCOG states that 'conveying the concept that fetal death is not the worst outcome, and that severe neonatal morbidity and maternal and fertility morbidity are also important considerations to the woman and her partner, must be conducted with kindness and sensitivity'
- Doctor counselling parents should not impose his/her cultural or religious convictions on those whose beliefs may differ. When a doctor's beliefs prevent the disclosure of all available management options, he/she has a duty to refer woman to a colleague
- If there is a difference of opinion between clinical staff and parents regarding management, seek second opinion
- When completing the certificate, the doctor prints his/her name after the signature and records their GMC number
- If it is not possible for a doctor to see baby before he/she dies, document this clearly in the healthcare record. Doctor should see baby as soon as possible after death
- In some areas, all deaths must be discussed with the coroner's office. Check your local coroner's requirements before issuing death certificate and requesting post mortem consent

### Definition of signs of life

- It is extremely important to distinguish between involuntary, physiological movements and signs of life
  - A live birth is delivery of a baby, regardless of duration of pregnancy, which, after delivery, breathes or shows any other evidence of life, such as beating of the heart, pulsation of umbilical cord, or any definite movement of voluntary muscles, whether or not umbilical cord has been cut or placenta delivered
  - observed movement, such as a jerk of a limb or occasional gasp, are involuntary, physiological movements and not necessarily signs of life or viability
  - in these circumstances, explanations should be given to parents by a senior member of staff and registration as a neonatal death is not necessary
  - Where signs of life are evident at birth, inform parents that their baby may continue to show such signs for minutes or even hours following delivery and reassure them that baby will be treated with respect and dignity
  - Give parents the opportunity to keep baby with them until he/she dies
  - Baby must then be registered as a neonatal death
  - Once a baby is born alive he/she acquires the same legal status as any other human being and is owed a duty of care
- Baby must be seen by a doctor while alive (if possible). This does not have to be a neonatologist
  - Doctor who saw baby before death issues a medical certificate certifying death. The certificate must always be issued even if baby lived for only a few minutes
  - Neonatal death certificates can **only** be issued by a doctor. Midwives do **not** certify neonatal deaths

### CERTIFYING NEONATAL DEATH

## INTRODUCTION

- Prenatal screening for fetal abnormalities using second trimester ultrasound scan and maternal serum screening is offered routinely in the UK
- Routine second trimester ultrasound scans increase detection rate for fetal abnormalities compared to scans offered on a selective basis only
- Abnormalities may be detected on an ultrasound scan at any stage of pregnancy
- sensitivity of detection is determined by severity and type of abnormality. More severe abnormalities and those developing earlier have a higher detection rate
- false positive rates from ultrasound scanning are <1%

## SECOND TRIMESTER ANOMALY SCANNING

- To identify fetal conditions associated with high morbidity and long-term disability
- Performed between 18–23 weeks' gestation

***Ultrasound imaging must only be performed by person fully trained in its use and qualified in detection of fetal abnormality using this technique***

## Before scan

- Ensure ultrasound equipment is of appropriate standard and in working order
- Check woman's identity
- Inform woman of nature and purpose of the screening proposed and discuss the limitations of ultrasound scanning in detecting fetal abnormality i.e. sensitivity of detection is only 76% even for life-threatening abnormalities
- Treat woman sympathetically and address anxieties or concerns

- If woman does not wish to be informed of any fetal abnormalities, give her the opportunity to decline anomaly scanning but to have a scan to determine placental site and fetal growth

## ABNORMALITY DETECTED

- Sonographer performing ultrasound examination must report findings to woman and document the discussion
- Inform woman and her partner in descriptive but not diagnostic terms

***If there is doubt about a diagnosis or a scan feature, refer woman to appropriate expert, giving reason for referral***

## Referral

- Within 1 working day, refer to consultant obstetrician with fetal medicine expertise
- Fetal medicine consultant will re-scan within 5 days and explain findings to woman and her partner
- it may be necessary to repeat information. Written information and diagrams can be helpful
- When major fetal abnormalities are identified, give parents the Antenatal Results and Choices (ARC) booklet (if used locally)
- It may be appropriate for consultant with expertise in fetal medicine to offer fetal karyotyping by amniocentesis or chorionic villus sampling
- Refer confirmed fetal abnormalities in ongoing pregnancies to neonatologist
- Feticide is recommended for termination of pregnancy >22 weeks' gestation, which is associated with increased difficulty in managing a woman who elects termination later than this stage
- More complex cases may benefit from referral to a tertiary centre e.g. to obtain access for magnetic resonance (MR) imaging or to receive antenatal counselling from neonatal surgeon
- Complete notification to the regional congenital anomaly register

### Normal variants

- It is no longer recommended to screen for 'soft markers for Down's syndrome'. However, the following appearances should be reported and the woman referred for further assessment:
- nuchal fold >6 mm
- ventriculomegaly (atrium >10 mm)
- echogenic bowel (with density equivalent to bone)
- renal pelvic dilatation (AP measurement >7 mm)
- standard growth measurements compared to dating scan (significantly <5<sup>th</sup> centile on national charts)

### Documentation

- A printed formal report must be produced and a copy placed in maternal healthcare record
- Record positive and relevant negative findings that are important to that particular clinical situation
- Store relevant images
- Trigger a neonatal alert

### SCREENING FOR DOWN'S SYNDROME

- Offer Down's syndrome screening
- combined test (11<sup>+2</sup>–14<sup>+1</sup> weeks) with nuchal scan or quad test (14<sup>+2</sup>–20 weeks)
- Women with a multiple pregnancy who wish to have Down's screening:
  - offer combined test (11<sup>+2</sup>–14<sup>+1</sup> weeks) or quad testing, having had the opportunity to discuss implications of screening in twin pregnancy with either an antenatal screening midwife or fetal medicine midwife – see **Multiple pregnancy** guideline
- Some women choose to have a blood test to examine cell free fetal DNA (not currently available on the NHS)

### INVASIVE TESTING FOR FETAL ABNORMALITY

- Performed for fetal karyotyping or other genetic testing

### Amniocentesis

- Performed > 15 weeks, by an appropriately trained operator
- rate of miscarriage associated with amniocentesis is approximately 1%

### Chorionic villus sampling (CVS)

- Performed > 11 weeks, by an appropriately trained operator
- rate of miscarriage following CVS is approximately 1–2%

**BACKGROUND**

- Fetal blood sample (FBS) is a sample of blood taken using aseptic technique from the presenting part of the fetus in-utero
- Fetal pH can identify fetal hypoxemia and acidosis
- when the fetus is hypoxemic, metabolism changes from aerobic to anaerobic, producing lactic acid and a subsequent drop in pH, providing a measure of the degree of hypoxaemia
- Electronic fetal monitoring (EFM) without supporting FBS in suspected fetal distress in labour is associated with significant increase in caesarean delivery, with no apparent improvement in neonatal outcome (see **Electronic fetal monitoring** guideline)

**INDICATIONS**

- Consider fetal pH:
- with abnormal EFM, FBS can be helpful in planning further management and can be performed in first and second stage of labour
- if CTG is classified as abnormal, but urgent intervention is not required, confirmation of fetal wellbeing to be obtained through FBS where possible, along with conservative measures (see below)

***Do not undertake FBS where there is clear evidence of acute fetal compromise. Make preparations for urgent birth***

***Assess and manage each woman individually and, where there is cause for concern, seek advice from on-call consultant obstetrician***

- Take 2 samples, to ensure reliability of result. Remember an FBS only reflects the condition of the fetus at the time of sampling

**CONTRAINDICATIONS**

**Absolute**

- Acute fetal compromise (e.g. prolonged deceleration): FBS should not be undertaken and baby delivered urgently
- Maternal infection e.g. HIV [viral load >50 copies/mL not taking highly active antiretroviral therapy (HAART)], hepatitis viruses or herpes simplex virus. FBS increases risk of transmission to baby
- Group B streptococcus carrier status does not preclude FBS
- Fetal bleeding disorders e.g. haemophilia
- Prematurity (<34 weeks' gestation)
- Face presentation

**Cautions with maternal bleeding disorders**

- Sampling acceptable:
  - type 1 von Willebrand disease (vWD)
  - idiopathic thrombocytopenic purpura (ITP) – providing previous children did not have low platelet count immediately following birth
- If vWD or ITP in first pregnancy/previous children born with thrombocytopenia, **do not** undertake FBS without discussion with consultant obstetrician and consultant haematologist

**Relative**

- Gestation 34–36<sup>+6</sup> weeks
- Maternal pyrexia >38°C
- Suspected/confirmed intrauterine sepsis
- Discuss with consultant obstetrician

**FBS NOT POSSIBLE**

- If FBS necessary but cannot be obtained due to technical difficulties or contraindications consider delivery – discuss with consultant obstetrician
- Urgency to deliver should take into account:
  - severity of CTG abnormality
  - relevant maternal factors

## PREPARATION

### Equipment

- Sterile FBS pack
- Chlorhexidine acetate BP 0.05% cleansing solution
- Sponge holder
- Amnioscope
- Light source
- Blade
- Blade holder
- Capillary tube pack
- White soft paraffin
- Lubricant gel
- Ethyl chloride spray
- Urinary catheter (if required)
- Fetal scalp electrode (if required)

### Consent

- Explain procedure to woman and obtain verbal consent
- document consent in maternal healthcare record

## PROCEDURE

*Take preparation time into consideration when performing repeat samples.*

*If sample result is not available  $\leq 30$  min, consider need for delivery*

*Timing of any subsequent test(s) should take into account the time also required to obtain sample(s)*

### Midwife

- Prepare equipment
- Assistant to (ideally) position woman in left lateral position
- Continue EFM. If significant fetal deterioration e.g. bradycardia, proceed to urgent delivery
- Inform delivery suite team leader, who will escalate to other staff involved e.g. anaesthetist

- Avoid leaving woman alone while sample is processed, especially if her legs are on supports

### Obstetrician

- Cleanse vulva
- Drape with sterile towel
- Insert lubricated amnioscope to access fetal scalp and connect/position light source
- Clean fetal scalp
- Spray scalp with ethyl chloride spray
- Apply white soft paraffin to area of scalp where FBS sample is to be taken
- Incise scalp with blade, collect sample with capillary tube and give to assistant
- Take a second sample (for immediate analysis in blood gas analyser)
- Clean the area and reposition woman to minimise discomfort
- Attempts to obtain sample not  $>30$  min

### Analysing sample

- A healthcare professional trained in the use of the blood gas analyser will take samples to the analyser, process sample and inform obstetrician of result

### *pH values may be altered by the following events:*

- Contamination with amniotic fluid
- Contamination with meconium
- Presence of air bubbles (↑pH value)
- Fetal scalp oedema or caput (↓pH value)
- Delay in processing (↓pH value)

### Umbilical cord samples

- For all deliveries requiring FBS in labour, take paired cord umbilical cord samples at delivery – see **Umbilical cord sampling** guideline

**INTERPRETATION OF RESULT**

- Interpret results taking into account:
  - previous lactate/pH measurement
  - rate of progress of labour
  - maternal/fetal clinical features

**Response to fetal scalp stimulation**

- If fetal scalp stimulation leads to acceleration in FHR – regard as reassuring feature
  - take into account when reviewing whole clinical picture
- If FBS unsuccessful or contraindicated – use FHR response after fetal scalp stimulation during vaginal examination to elicit information about fetal wellbeing

**Table 1: Results classification**

Lactate (mmol/L)	pH	Interpretation	Range	Action
≤4.1	≥7.25	Normal	–	–
4.2–4.8	7.21–7.24	Borderline	Pre-acidotic	Repeat ≤30 min, or sooner if deteriorates further
≥4.9	≤7.20	Abnormal	Acidotic	Inform consultant obstetrician delivery indicated

- If results seem completely out of keeping with clinical picture (lactate or pH higher/lower than expected) discuss with consultant obstetrician
- Timing of repeat samples should take into consideration time taken to obtain another sample

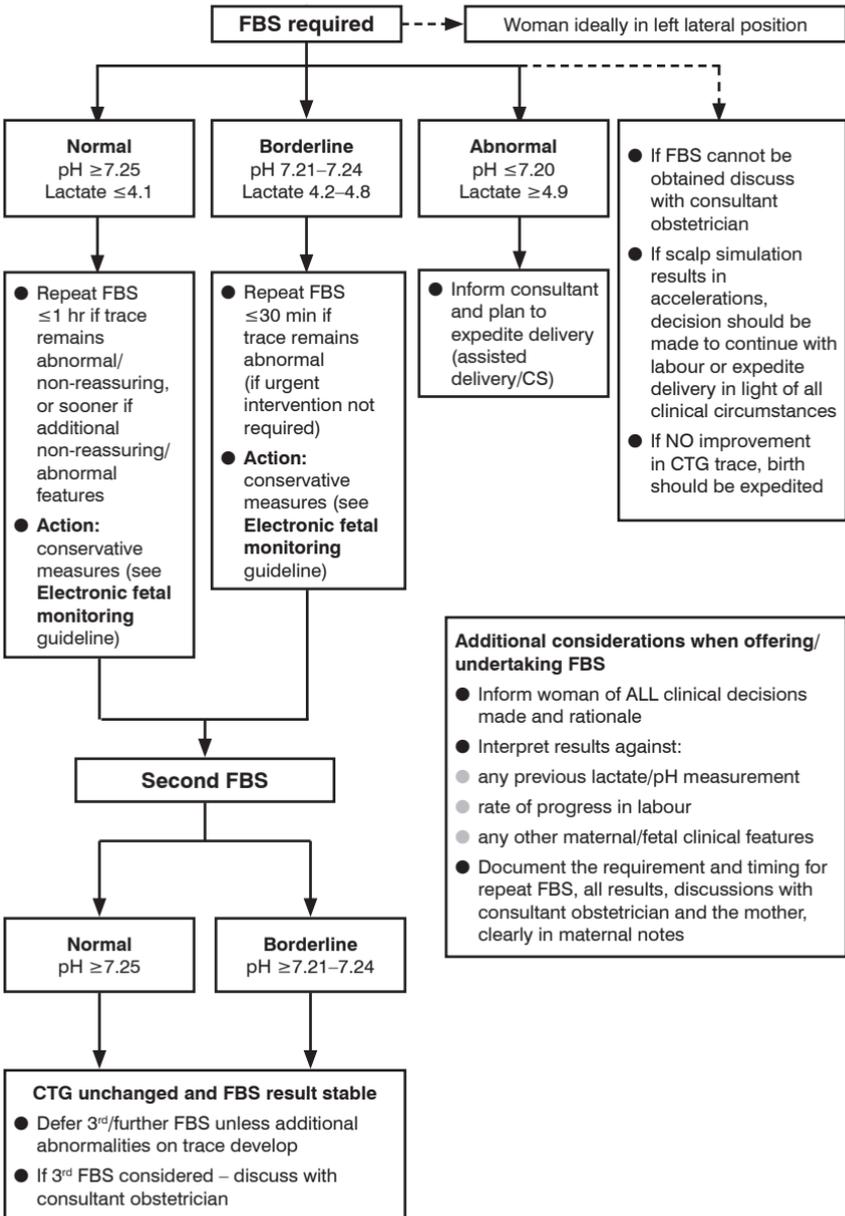
**DOCUMENTATION**

- Ensure results sheet is secured in maternal healthcare record and written in intrapartum documentation
- If expediting birth, record time at which decision is made and the management plan

**Communication**

- Ensure parents and family are reassured and fully informed of procedures, individualised plan of care and sequence of events at all times by attending obstetric, neonatal and midwifery staff
- parents may also require a debrief following delivery

Flowchart – Fetal blood sampling



## INTRODUCTION

**Read this guideline in conjunction with the Caesarean section guideline**

Risk of failed intubation in the obstetric population is approximately 10 times greater than in non-obstetric population. Most difficult airways are unanticipated

## SAFE OBSTETRIC GENERAL ANAESTHESIA

### Pre-induction planning and preparation

- Perform anaesthetic risk assessment at antenatal clinic through an anaesthetic referral to:
  - provide counselling for woman
  - prepare a team management plan

### Risk factors for identifying difficult intubation

- Previous surgery, radiotherapy or injury to head and neck
- Previous history of difficult intubation
- Congenital craniofacial abnormalities
- Raised BMI at booking and full term
- Large protruding incisors
- Restricted neck movement (full, unhindered range of at least 90°)
- Restricted mouth opening (<3 fingers breadth), jaw slide
- Abnormal Mallampati view (pharynx should be visible)

### Consent

- Obtain and record consent
- Discuss:
  - rapid sequence induction (cricoid pressure)
  - awake extubation
  - failed intubation

## Antacid regimen

- High-risk labouring women – ranitidine 150 mg oral 6-hrly
- Elective lower segment caesarean section (LSCS) – ranitidine 150 mg night before and on morning of surgery
- Emergency LSCS – ranitidine 50 mg IV (if not already receiving orally)
- Consider prokinetic drug e.g. metoclopramide
- Sodium citrate: 30 mL of 0.3 M sodium citrate drink  $\leq$ 20 min of anaesthesia for all grade 1–3 general anaesthesia caesarean section (CS) and, if local policy to grade 4 CS

## Intrauterine resuscitation for emergency CS

- If appropriate employ intrauterine resuscitation
  - left lateral position
  - 1 L Hartmann's solution
  - tocolytic e.g. terbutaline
  - pressors to correct hypotension
- Reassess urgency in theatre before general anaesthesia

## Rapid sequence induction

**If difficult intubation envisaged, call for senior help. Mark cricothyroid membrane with use of ultrasound**

## Equipment

- Appropriately checked anaesthetic machine and suction
- Oro-pharyngeal airways and laryngeal masks [supraglottic airway device (SAD)]
- Range of endotracheal tubes (ETT)
- Range of laryngoscopes – including video laryngoscope (if available)
- Other difficult airway adjuncts as per local protocol (e.g. gum elastic bougie)
- Cricothyrotomy kits/jet ventilation equipment

## INDUCTION

- Keep noise to minimum during induction
- Establish full monitoring
  - pulse oximeter
  - non-invasive BP
  - ECG
  - capnography and airway gas monitoring
  - airway pressure
- Confirm sodium citrate and ranitidine have been given, if not, consider ranitidine 50 mg IV slowly after induction
- Establish free-running IV infusion with a 16 G (or larger) cannula
- Position woman supine on table with a 20–30° head up and 15° left lateral tilt
- In morbidly obese use ramped up position – align external auditory meatus with supra-sternal notch
- Remove oral piercings and hair bands
- Give appropriate antibiotics – according to local practice

## Pre-oxygenation

- Consider attaching nasal cannulae 5 L/min before pre-oxygenation
- Pre-oxygenate for 3 min with 100% oxygen > 10 L/min via close-fitting face mask

## Anaesthetic administration

- Administer rapid bolus dose of  $\geq 5$  mg/kg thiopentone or propofol
- follow with suxamethonium 1 mg/kg
- Use rocuronium 1–1.2 mg/kg only if Sugammadex® 16 mg/kg available
- in high risk woman, consider use of short-acting opiate to obtund sympathetic response
- Initially apply 10N cricoid pressure, then increasing to 30N after loss of consciousness
- Inflate cuff
  - check for audible leak
  - check correct placement
  - release cricoid pressure

- Use atracurium **or** rocuronium after suxamethonium wears off
- Maintain anaesthesia with oxygen and air **or** oxygen and nitrous oxide (usually 50% N<sub>2</sub>O pre- and 67% post-delivery), with an inhalational agent (isoflurane/sevoflurane) to keep a MAC of  $\geq 1$
- Remember the possibility of patient awareness at all times

## AFTER DELIVERY

- After cord clamped, give opioid – e.g. fentanyl 100 microgram and morphine 10 mg. Alternatively, if epidural *in situ*, top-up with local anaesthetic and epidural opioid
- At end of surgery, and if not contraindicated, give 100 mg diclofenac rectally
- Perform TAP blocks at the end of surgery for post-operative pain relief
- Extubate woman awake in left lateral position in theatre
- Obese women may benefit from waking up in upright position

## Transfer to recovery room

- Transfer to recovery room for  $\geq 30$  min
- See **Recovery** guideline

## OBSTETRIC FAILED TRACHEAL INTUBATION

### Laryngoscopy

- **During first attempt:** if failed call for consultant anaesthetist help urgently
- **Second attempt:** consider simple changes in technique (head position, laryngoscope blade, alteration of cricoid pressure). If failed focus on oxygenation
- Ventilate with 100% oxygen with bag and mask or SAD
- Immediately insert SAD before drugs wear off (2<sup>nd</sup> generation SAD advised)
- Consider temporary release of cricoid during insertion – 2 attempts only

**'Can't intubate but can ventilate' situation**

- Decision to wake will depend upon on the following factors:
  - woman's life at risk (cardiac arrest, massive haemorrhage)
  - baby's life at risk (severe fetal distress)
  - aspiration risk
  - anaesthetist seniority

**Anaesthesia with spontaneous respiration**

- Call for senior help
- Deepen anaesthesia with sevoflurane (non-irritant) or total intravenous anaesthesia (TIVA)
- Paralyse with rocuronium only if Sugammadex® available
- Maintain cricoid pressure
- Prevent awareness
- Pass a nasogastric tube with 2<sup>nd</sup> generation SAD to suction gastric contents
- **Do not** attempt intubation through an LMA or fibre optic intubation without experienced senior help
- Anticipate laryngospasm
- Senior obstetrician to operate

**MANAGEMENT AFTER FAILED INTUBATION**

**'Can't intubate, can't ventilate' situation**

- Declare emergency: call for senior help and ENT surgeons
- If due to intrinsic patient factors (laryngospasm, poor chest compliance) – consider giving muscle relaxants
- Follow current Difficult Airway Society (DAS) guidelines for front of neck access

**After waking patient**

- Review urgency of surgery
- Intrauterine resuscitation

**Anaesthetic options**

- Regional anaesthesia
- Secure airway before general anaesthesia

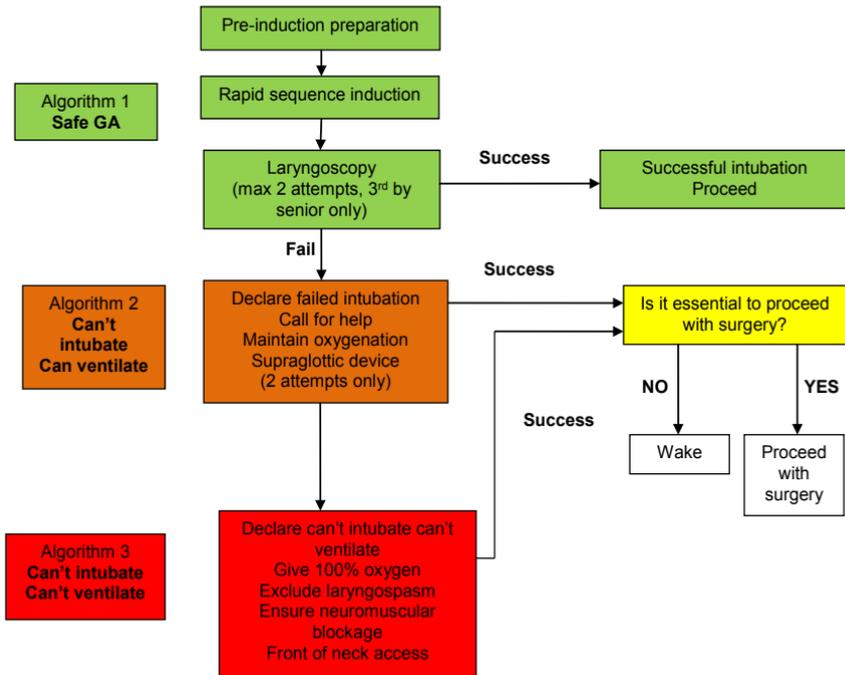
**Extubation strategy**

- Ensure senior help has arrived
- Evaluate general clinical factors that may have an adverse impact on ventilation before extubation
- Ensure there is no upper airway oedema (leak around a deflated cuff)
- Consider a strategy for reintubation if necessary
- Always perform an awake extubation

**Follow-up care**

- Document description of airway difficulties encountered (in ventilation and intubation). Include airway management techniques employed
- Enquire directly about awareness
- Counsel woman appropriately post-operatively
- Follow-up for potential complications: oedema, bleeding, tracheal and esophageal perforation, pneumothorax and aspiration
- Inform GP and woman in writing
- In complex cases offer anaesthetic outpatient appointment

Flowchart: Failed intubation algorithm



## GENITAL HERPES • 1/2

Neonatal herpes is a rare (1.65/10,000 in the UK) but serious disease with a significant mortality

### Causes

Herpes simplex virus type 1 (HSV-1) or herpes simplex virus type 2 (HSV-2)

### Transmission

Transmission of virus from mother to fetus occurs mostly by direct contact with virus in the genital tract during birth, although cases of transplacental infection and postnatal transmission have been reported

### Maternal infection

May be primary or recurrent

### Primary infection

- Risks are greatest in the third trimester, particularly  $\leq 6$  weeks of delivery, as viral shedding may persist and baby is likely to be born before the development of protective maternal antibodies

### Recurrent infection

- Is associated with a very low risk of neonatal herpes
- Recurrent herpes at the time of delivery causes localised forms of neonatal herpes only

## ANTENATAL DIAGNOSIS AND MANAGEMENT

- Refer women who present with lesions that are thought to be herpes to genitourinary medicine (GUM). Make it clear the woman is pregnant
- GUM clinic will arrange screening for other sexually transmitted infections
- Active herpes is painful and analgesia with lidocaine 2% gel may be required
- Ask directly whether woman can pass urine. It is not unusual for an indwelling catheter to be required

## Antiretroviral therapy

- Women with a history of recurrent herpes may reduce the risk of active lesions at time of delivery by taking oral aciclovir for the last 4 weeks of pregnancy. Refer them to GUM for further discussion
- If woman develops primary infection before or earlier in pregnancy, prophylactic oral aciclovir is not recommended in the last 4 weeks of pregnancy

## DELIVERY

### Mode of delivery

- If woman develops her first episode of active herpes  $> 28$  weeks' gestation or  $\leq 6$  weeks of the onset of labour, offer delivery by caesarean section (CS)
- If an attack occurs in the third trimester that is thought to be primary, send swab and blood for HSV antibodies
- If the virus types on swab and blood match the attack is recurrent – advise against CS
- There is no indication to deliver a woman by CS because of a history of genital herpes before pregnancy or earlier in pregnancy
- Advise women with active recurrent herpes lesions at the onset of labour that the risk of neonatal herpes is very small and that CS is not routinely recommended

## Care in labour

### Primary infection

- If woman refuses delivery by CS, avoid fetal scalp electrodes, fetal blood sampling and, where possible, instrumental delivery to minimise risk of vertical transmission
- Inform neonatologists during labour
- Give aciclovir, 5 mg/kg (350 mg for a 70 kg woman) IV 8-hrly over 60 min

## GENITAL HERPES • 2/2

### Recurrent infection

- Women with active recurrent genital herpes and confirmed rupture of membranes – augment labour as soon as possible
- In women with active recurrent genital herpes, avoid invasive procedures during labour and inform neonatologists

### Preterm labour

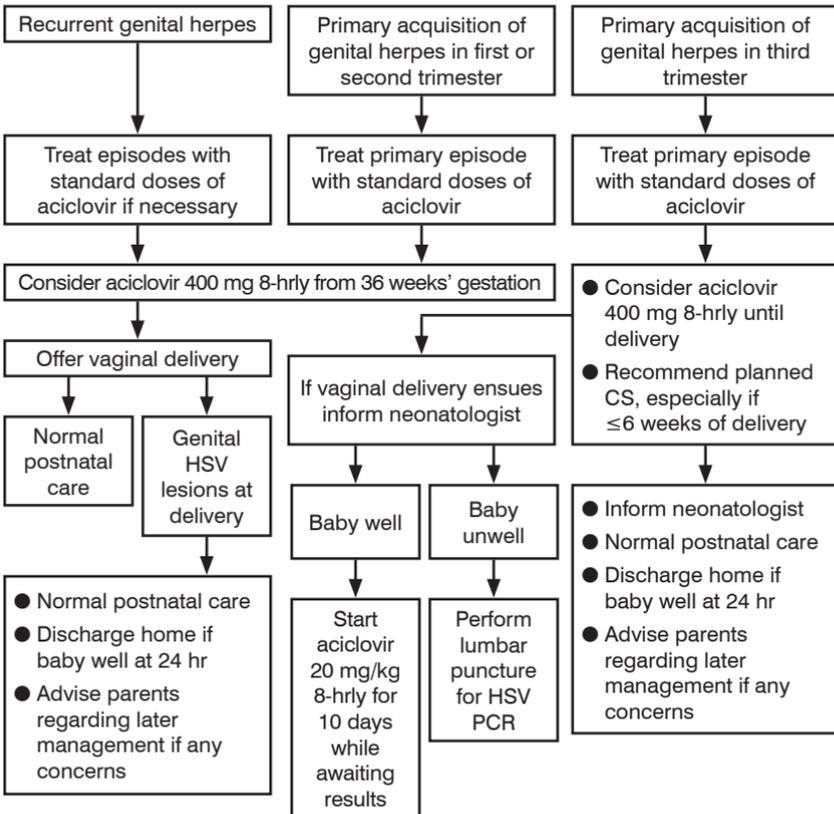
- If woman has primary genital herpes and delivery is induced, deliver by CS
- If managing conservatively give betamethasone for neonatal lung function

- Give woman aciclovir 5 mg/kg IV 8-hrly over 60 min
- If woman has recurrent genital herpes and has preterm pre-labour rupture of membranes <34 weeks, give aciclovir 400 mg oral 8-hrly

### Care of neonate

- Encourage breastfeeding unless woman has herpetic lesions around nipple
- Advise woman and family about good hand hygiene
- Those with oral herpetic lesions (cold sores) should not kiss neonate

### Algorithm for the management of herpes in pregnancy and care of neonate



### BACKGROUND

- Group B *streptococcus* (GBS) disease in the newborn is defined as **early onset** within first 7 days of life – over 90% present within first 24 hr of birth
- often with rapid onset in first hours after birth
- There is a 10% mortality rate in affected neonates
- Risk can be reduced by giving maternal intrapartum antibiotics – see **Intrapartum antibiotics** below
- Late onset cannot be prevented

### ANTENATAL MANAGEMENT

- Routine antenatal screening not recommended

### GBS detected in current pregnancy

#### **MSSU positive**

- Recommend antenatal and intrapartum antibiotics
- **Antenatal antibiotics** – oral penicillin preparations. If allergic to penicillin, according to sensitivities (e.g. erythromycin) and local guidance. If none available, discuss with microbiologist
- **Intrapartum antibiotics** – see **Intrapartum antibiotics** below
- Clearly document the need for intrapartum antibiotics in maternal healthcare record

#### **Vaginal swab positive**

#### **From high vaginal swab (HVS)/low vaginal swab (LVS)**

- If detected at any gestation, advise intrapartum antibiotic prophylaxis (IAP). Place of birth will be dependent on locally agreed pathway for women with GBS detected in pregnancy – see **Intrapartum antibiotics** below

- Antenatal antibiotics are **not** recommended as GBS is normal vaginal flora for many women
- Clearly document the need for intrapartum antibiotics in maternal healthcare record

### INTRAPARTUM MANAGEMENT

#### **Indications for intrapartum antibiotics**

- Any one of the following:
  - previous infant with invasive GBS disease; arrange consultant-led unit care
  - GBS bacteriuria this pregnancy
  - GBS on vaginal swab in this pregnancy
  - fever  $\geq 38^{\circ}\text{C}$  during labour at any gestation. Refer to local policy for treatment of intrapartum pyrexia
- Inform mother of the risk of adverse reaction to antibiotics and that, despite attempts at prophylaxis, some babies will still acquire infection
- In women with GBS and spontaneous rupture of membranes at term in the absence of labour, advise immediate induction of labour with intrapartum antibiotics once in labour

#### **Intrapartum antibiotics**

- Vaginal delivery – give **mother** benzylpenicillin 3 g IV in 100 mL sodium chloride 0.9% over 10 min then 1.5 g 4-hrly until delivery
- if allergic to penicillin, give clindamycin 900 mg IV in 50 mL sodium chloride 0.9% over 30 min 8-hrly until delivery
- give intrapartum antibiotics as soon as possible after the onset of labour and  $\geq 2$  hr before delivery

### Antibiotic prophylaxis not indicated

- Caesarean section – no investigation or treatment necessary if intact membrane, no suspicion of chorioamnionitis and no maternal fever

***If chorioamnionitis suspected, give broad-spectrum antibiotics, which will also cover Group B streptococcal disease***

### NEONATE

#### Risk factors for infection

- Maternity service to inform neonatal service of risk factors
- antenatal detection of GBS colonisation (unless intrapartum antibiotics received)
- pre-labour rupture of membranes
- preterm birth (<37 weeks), especially with pre-labour rupture of membranes
- confirmed or suspected chorioamnionitis (e.g. intrapartum fever)
- invasive group B streptococcal (GBS) infection in a previous baby
- antibiotic treatment given to mother for confirmed or suspected invasive bacterial infection 24 hr before, during, or post labour
- Breastfeeding does not increase risk of neonatal GBS disease

#### Observations

- If antibiotics indicated but not given or received an inadequate dose of IAP, observe baby for 12–24 hr after birth on postnatal ward with regular assessment of:
  - general wellbeing
  - feeding
  - heart rate
  - respiratory rate
  - temperature

### Recognition and assessment

- Signs of early GBS infection are non specific and could include:
  - grunting/tachypnoea/respiratory distress
  - pallor/cyanosis
  - lethargy
  - irritability
  - poor feeding
  - tachycardia/bradycardia
  - hypotension
- Treat all babies from a multiple pregnancy if infection suspected in 1
- For red flag signs, risk factors, and clinical indicators for treatment, follow **Infection in first 72 hours of life** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines, if used locally

## HEPATITIS B

### Introduction

Hepatitis B is a blood borne viral infection affecting the liver. It is caused by the hepatitis B virus (HBV) transferred in blood or body fluid

### Principles of isolation

- Body fluids are regarded as infectious material. Take appropriate infection control precautions in line with local Trust policy

### Antenatal care

- As part of antenatal care, provide all women with information on, and access to, HBV screening
- If mother positive for HBV:
  - review in consultant-led antenatal clinic, where an individualised management plan will be drawn up
  - alert neonatal team and inform Public Health team and GP of plan to immunise
- Arrange for prophylaxis
  - for multiple pregnancy arrange dose for each baby
- Refer women with HBV infection to a consultant with expertise in liver disease for further assessment

### Communication

- Give mother information about hepatitis B, modes of transmission and prevention of spread
- Obtain parental consent for immunisation

### Intrapartum care

- When an HBsAg positive mother arrives in labour or for CS, inform on-call neonatal team
- **Avoid fetal scalp sampling and fetal scalp electrodes**

- Hepatitis B infection is not an indication for CS as there is insufficient evidence that it reduces mother-to-child transmission
- If unbooked or untested woman accepts testing, send sample for antenatal screening to microbiology urgently (notify microbiologist on duty/on-call via switchboard) to allow immunisation within 24 hr of delivery if required
- If woman requires in-utero transfer, immunoglobulin (if indicated) must accompany her

### Postnatal care

- For all newborns, check antenatal screening results for mother's tests
- If antenatal testing not done (e.g. concealed pregnancy) request urgent maternal hepatitis B virus surface antigen (HBsAg) test and other infection screening bloods (HIV and syphilis) – see **HIV positive women** guideline
- Wash baby immediately following birth and cleanse oropharynx and nasal cavities of all visible maternal blood and secretions by gentle wiping
- Encourage and support breastfeeding (unless mother also HIV +ve) but do not allow mother to donate milk as the virus has been detected in breast milk
- Inform postnatal ward baby will require immunisation

## IMMEDIATE POSTNATAL TREATMENT OF BABY

### Immunisation

- Some babies require hepatitis B immunoglobulin (HBIG) as well as immunisation
- Order immunoglobulin [HBIG antenatally if required (see **Table**)], depending on mother's antigen status
- Immunise baby of HBsAg positive mother as follows, depending on other hepatitis B markers in mother during pregnancy:

Maternal status	Vaccine required by baby	Immunoglobulin (HBIG) required by baby
HBsAg positive, HBeAg positive	Y	Y
HBsAg positive, HBeAg negative, HBe antibody (anti-HBe) negative	Y	Y
HBsAg positive where e markers have not been determined	Y	Y
Acute hepatitis B during pregnancy	Y	Y
HBsAg positive and baby < 1.5 kg	Y	Y
HBsAg positive, anti-HBe negative	Y	N
HBsAg positive and > 10 <sup>6</sup> iu/mL Hepatitis B DNA in antenatal sample	Y	Y
Other high risk group (e.g. HIV)	Y	N

- Give low birth weight and premature babies full neonatal dose of hepatitis B vaccine
- Give HBIG and hepatitis B vaccine to babies with birth weight < 1.5 kg born to mother with hepatitis B, regardless of mother's HBeAg status
- obtain HBIG from regional virus laboratory service or local microbiology as applicable
- Give hepatitis B vaccine to HIV exposed/infected neonates

### When

- Give first immunisation +/- HBIG within 24 hr of delivery on postnatal ward. Check that arrangements are in place for further immunisations and follow-up to be provided in the community or by paediatrician – see **Hepatitis B and C** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)

### What

- Hepatitis B vaccine, 0.5 mL IM.  
**Caution:** brands have different doses [e.g. engerix-B® 10 microgram (recommended), HBVaxPro Paediatric® 5 microgram]

- HBIG 200 units additionally IM in opposite thigh to that of the hepatitis B vaccine soon after birth and no later than 24 hr simultaneously with vaccine to babies of highly infectious mothers (see **Table** above)
- 3 further doses of hepatitis B vaccine will be given according to local policy at aged 1 month, 2 months and 1 yr

### How

- Use 2 separate injection sites for hepatitis B vaccine and HBIG, in anterolateral aspect of the thighs (not buttocks)
- Give hepatitis B vaccine IM, except in bleeding disorder where it may be given deep subcutaneously

### Dose regimen for infants of mothers with hepatitis B

- Vaccine is given at 0, 1, 2 and 12 months
- Book hospital outpatient appointment for 12 months for testing for HBsAg
- see the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal **Hepatitis B and C** guideline (if used locally)

### Relationship to other immunisations

- No need to delay BCG following HBIG
- Hepatitis B vaccine may be given with other vaccines, but use separate site. If same limb used, give vaccines >2.5 cm apart

**HEPATITIS IMMUNISATION****To whom**

- Hepatitis B immunisation is recommended with other routine immunisations for high risk babies born to mothers:
- with partners who are hepatitis B surface antigen (HBsAg) positive
- who are or with partners who are IV drug users (even if HBsAg negative)
- who change sexual partners frequently (e.g. commercial sex workers)
- with close family contacts known to be HBsAg positive
- who intend to live in a country with high prevalence of hepatitis B (Africa, Asia, Eastern Europe, Northern Canada, Alaska)

**Dose regimen for infants of mothers HBsAg negative with other indications for vaccination**

- Vaccine is given at aged 0, 1 and 6 months – see **Hepatitis B and C** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)

**HEPATITIS C****Introduction**

- Hepatitis C is a blood borne viral infection carrying a high risk of chronic infection and liver disease. Only 1–2% of pregnant women are anti-HCV +ve in the UK
- It is caused by the hepatitis C virus (HCV) transferred in blood and body fluids

**High risk groups**

- Current or former intravenous drug use or women with partners who are intravenous drug users
- From a country of high prevalence [e.g. North Africa (particularly Egypt), Middle East]

**Principles of isolation**

- All body fluids are considered infectious material. Take appropriate infection control precautions in line with local Trust policy

**Antenatal care**

- A test for HCV infection is not part of routine antenatal screening, but should be offered to women who report a history of IV drug use in themselves or their partner, and to women who believe they had a positive test for HCV Ab in the past. A positive HCV RNA report confirms current HCV infection
- Refer pregnant women with HCV infection to a consultant with expertise in liver disease for further assessment
- Reassure woman with HCV infection that pregnancy will not affect the course of the HCV infection and HCV infection will not affect the course of the pregnancy, and that the risk of mother-to-child transmission of HCV is low in the absence of HIV infection
- Alert neonatal team

**Intrapartum care**

- **Avoid fetal scalp blood sampling and fetal scalp electrodes**
- Because of increased risk of fetal abrasion or scalp trauma, avoid difficult instrumental delivery
- Hepatitis C infection is not an indication for CS, as there is insufficient evidence that it reduces mother-to-child transmission. However, if woman is co-infected with HIV, CS is indicated

**Postnatal care**

- Presence of passively acquired maternal antibodies that can persist in infants until aged 15–18 months renders anti-HCV Ab detection of limited value for diagnosis of infection. To investigate vertical transmission, review child at aged 18 months and aged 3 and 12 yr
- There is no contraindication to breastfeeding unless dual HCV and HIV infection – see **HIV positive women** guideline

### INTRODUCTION

- High dependency care (also known as enhanced maternity care) on delivery suite provides an intermediate level of care between that on a ward and critical care unit (CCU). This can be level 1 and 2 critical care
- Women requiring multiple organ support or requiring mechanical ventilation (level 3 care) will require transfer to CCU

### PRINCIPLES OF MANAGEMENT

- To care for women who have been recognised as unwell using the MEWS system to safely provide more frequent observation and monitoring in individual clinical cases
- To provide individualised multidisciplinary care
- To stabilise woman before transfer to critical care facilities

### EQUIPMENT

- Ensure stock levels of appropriate equipment in the room used are maintained and checked as per local practice
- Resuscitation trolley with defibrillator and airway management equipment
- Resuscitation/emergency drugs
- Monitoring equipment and accessories for:
  - pulse
  - BP
  - ECG
  - SaO<sub>2</sub> and with transducer facility for invasive monitoring
- Equipment for insertion and management of invasive monitoring (arterial and CVP)
- Piped oxygen and suction
- Intravenous fluid warmer
- Forced air warming device
- Infusion pumps

### Available on delivery suite/unit

- Thermometer
- Intravenous fluid warmers, forced air warming devices
- Blood gas analyser
- Emergency major haemorrhage equipment
- Emergency eclampsia equipment
- Access to blood results
- O-ve blood
- Transfer equipment – monitor and ventilator

**LEVELS OF CRITICAL CARE**

<b>Level 0</b>	Needs can be met through normal ward care
<b>Level 1</b>	Women at risk of deterioration and requiring a higher level of observation
<b>Level 2</b>	<p>Invasive monitoring/intervention required that includes support for a single failing organ (excluding advanced respiratory support)</p> <p><b>Basic respiratory support</b></p> <ul style="list-style-type: none"> <li>● ≥50% oxygen via face mask to maintain oxygen saturation</li> </ul> <p><b>Basic cardiovascular support</b></p> <ul style="list-style-type: none"> <li>● IV anti-hypertensives e.g. pre-eclampsia</li> <li>● CVP and arterial line management</li> </ul> <p><b>Advanced cardiovascular support</b></p> <ul style="list-style-type: none"> <li>● Simultaneous use of ≥2 anti-arrhythmic/anti-hypertensive/vasoactive drugs IV</li> </ul> <p><b>Neurological support</b></p> <ul style="list-style-type: none"> <li>● Magnesium infusion to control seizures</li> </ul> <p><b>Hepatic support</b></p>
<b>Level 3 CCU</b>	<p>Advanced respiratory support required (mechanical ventilation) alone or basic respiratory support together with support of ≥1 additional organ</p> <p><b>Advanced respiratory support</b></p> <ul style="list-style-type: none"> <li>● Invasive mechanical ventilation</li> </ul> <p><b>Support of ≥2 organ systems</b></p>

**INDICATIONS FOR LEVEL 1 AND 2 CRITICAL CARE**

- **This list is not exhaustive**
- Women requiring invasive monitoring
- MEWS >6, or an increasing score despite intervention
- Severe pregnancy-induced hypertension
- PET, eclampsia, HELLP syndrome
- Acute fatty liver
- Major obstetric haemorrhage >2 L
  - causing maternal CVS compromise
  - requiring acute transfusion >4 units blood
- Management of sepsis/suspected sepsis utilising the Sepsis Six Bundle
- Sudden unexplained collapse
- Anaphylaxis

- Disseminated intravascular coagulation (DIC)
- Unstable medical condition e.g. diabetes, epilepsy, asthma

**Staff responsibilities**

- Women requiring maternal critical care must be discussed with consultant obstetrician, midwife co-ordinator and anaesthetist
- Midwives caring for the woman should be trained in providing critical care and A-Line management/use of magnesium sulphate and anti-hypertensive medication
- If woman receiving critical care, level 1 or greater, provide one-to-one care

- Clinical decisions should be made by consultant obstetrician in conjunction with anaesthetist and midwife
- consult specialist relevant to woman's specific condition early (need for this identified by triennial reports)
- advice from other disciplines should be preferably from consultant or  $\geq$  middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Consultant obstetrician and consultant anaesthetist review all women receiving level 2 care at least twice daily, and women receiving level 1 care at least once a day
- Inform obstetric and anaesthetic consultants early of any changes in clinical condition
- Perform detailed handover between clinicians at the end of each shift

### ON COMMENCEMENT OF HIGH DEPENDENCY CARE

- Formulate a management plan to include as a minimum:
  - frequency of observations and type of monitoring required
  - fluid balance
- VTE risk assessment, fit TED stockings unless contraindicated, and analgesia
- Pressure injury prevention (Bromage score)
- Monitoring of infusion sites (VIP score)
- Treatment of specific condition e.g. antibiotics, anti-hypertensives
- Clearly document handover to and from maternal critical care
- Use and complete all HDU documentation
- Provide and document the following information given to woman and her family:
  - reason for high dependency care
  - explanation of procedures, drugs and care given
- Duty of candour if required by consultant in charge of case
- complete incident report

- If possible keep baby with mother
- if not, ensure good communication with NNU
- promote breast feeding, collection of colostrum for baby

### MONITORING

#### Observations

- Undertake observations at frequency according to guidance for the underlying diagnosis and document in appropriate charts:
  - temperature
  - pulse
  - respiratory rate
  - oxygen saturations
  - blood pressure
  - fluid balance
  - consciousness level
  - blood results/arterial gas results

### CONSIDERATIONS FOR TRANSFER TO CRITICAL CARE AREA

- When woman requires:
  - level 3 critical care or respiratory support
  - level 2 critical care which cannot be provided on delivery suite
  - level 2 critical care of  $>1$  organ/system
  - level 2 critical care currently but at a significant risk of deterioration
- Start intensive care when it is needed with early involvement of ICU consultant. Do not delay until admission to CCU

***Decision to transfer woman to critical care area must be made by consultant obstetrician and consultant anaesthetist after discussion with intensive care specialists***

### Transfer

- Ensure documentation from all staff groups is complete as per local guidance, with details of how to contact them if further information is required
- Complete relevant transfer documentation including handover tool
- Refer to **Maternal transfer** guideline

### Discharge to non-maternity wards

- Where maternal condition dictates that ongoing care is required by another speciality, identify a named non-obstetric consultant to liaise with named obstetrician
- Named obstetrician is responsible for ensuring regular obstetric reviews
- Formally handover woman at each change of staff on labour ward as an outlier
- Continue midwifery input/checks daily or when appropriate document in departmental notes
- If woman is discharged home from a non-obstetric ward, inform labour ward co-ordinator to ensure community midwife is notified of discharge

### DISCHARGE FROM HDU

- Decision to discharge is made in consultation between obstetrician, anaesthetist and midwife, provided:
  - all observations are stable and organ support no longer required
  - woman is alert and orientated and no longer requires observation or treatment available on HDU
  - obstetrician has written an ongoing plan of care
  - there has been careful handover to the receiving ward using local handover tool
- After leaving HDU care, senior medical staff must review woman
- Provide woman with information about what has happened and encourage her to participate in decisions relating to recovery
- Outreach team to continue follow-up as appropriate
- Arrange outpatient appointment for consultant follow-up/debrief within 3 months

Check latest version of individualised maternal care plan

### TESTING

- Recommend HIV testing to all pregnant women as a routine part of antenatal screening
- if HIV testing declined, offer counselling by HIV specialist (if available)
- do not test without consent, explore reasons for refusal, promote testing to improve maternal health and reduce vertical transmission and document discussion
- Check HIV test result in notes at every visit; if no result available, recommend retesting. If not done early in pregnancy, offer at 28 weeks' gestation
- If in labour and no HIV test result, request urgent testing with consent

### ANTENATAL CARE

- Ensure consultant-led antenatal care in conjunction with HIV physician and, if available, HIV specialist nurses
- Amniocentesis or chorionic villus sampling should only be performed with antiviral cover
- Advise mother not to breastfeed and ensure she has formula and steriliser
- Ensure stock of zidovudine IV and zidovudine, lamivudine and nevirapine oral suspensions on labour ward
- See woman's individualised HIV care plan

### During pregnancy

- If an HIV positive woman becomes acutely unwell in pregnancy liaise with HIV physicians
- If a woman taking antiretrovirals presents with GI upset, fatigue, fever and breathlessness, check lactate levels; if raised do not give antiretrovirals and inform HIV team

### MODE OF DELIVERY

- Women known to be HIV positive will have been counselled antenatally and a plan made for mode of delivery and care on delivery suite
- Normal vaginal delivery is now recommended for women:
  - with a viral load of <50 copies/mL who have been treated antenatally with highly active antiviral therapy (HAART)
  - who are elite controllers (have a viral load of <50 copies/mL untreated) and who have been on zidovudine monotherapy (zidovudine IV in labour is not required)
- For women with a viral load of 50–400 copies/mL who have been treated antenatally with HAART, consider pre-labour caesarean section (CS), taking into account:
  - actual viral load
  - trajectory of viral load
  - length of time on treatment
  - adherence issues
  - obstetric factors
  - woman's views
- Pre-labour CS is advised for women with:
  - a viral load of >50 copies/mL who were not taking HAART, including women on zidovudine monotherapy
  - a viral load of >400 copies/mL for those who were taking HAART
  - women with an unknown viral load
  - untreated women
- Arrange pre-labour CS at 38–39 weeks' gestation

### INTRAVENOUS ZIDOVUDINE FOR DELIVERY

#### Indications

- Women with a viral load >1,000 copies/mL
- Untreated women with an unknown viral load

- Women on zidovudine monotherapy. An alternative for these women is to continue their oral regime
- There is no evidence that intrapartum zidovudine IV is beneficial for women taking HAART with a viral load of <1,000 copies/mL

### Medication

- Start zidovudine IV 4 hr before elective CS (or for as long as possible before emergency CS):
- prepare an infusion of 2 mg/mL in glucose 5%
- run 1 mL/kg/hr for first hour (for a 70 kg woman this is 70 mL/hr)
- after 1 hr, reduce rate to 0.5 mL/kg/hr (for a 70 kg woman this is 35 mL/hr)
- use actual body weight even if > 100 kg
- Stop infusion after cord is clamped

### VAGINAL DELIVERY

- Manage women with careful infection control procedures
- In women for whom intrapartum zidovudine IV is indicated, see **Intravenous zidovudine for delivery** above. It may be necessary to contact on-call pharmacist to ensure adequate supply of zidovudine
- If pre-labour rupture of membranes occurs at term, or in any gestation >34 weeks, commence oxytocin without delay – see **Oxytocin** guideline
- If labour is progressing normally, avoid amniotomy
- Be vigilant for pyrexia in labour and have low threshold for antibiotic therapy
- Continue oral HAART medication throughout labour
- Fetal blood sampling and fetal scalp electrodes are not contraindicated for woman with viral load <50 copies/mL taking HAART
- If instrumental delivery required, prefer low cavity forceps to Ventouse

### PRETERM DELIVERY

#### <34 weeks' gestation

- In threatened preterm labour or if baby has absent/reversed umbilical artery end diastolic flow, if mother's viral load >50 copies/mL, administer nevirapine 200 mg oral once to mother to load baby who will be **unable to take oral medication after birth**
- give nevirapine >2 hr before birth if possible
- Discuss with HIV consultant the use of double dose tenofovir +/- raltegravir to reduce risk of vertical transmission
- Continue mother's current antiviral therapy
- If preterm pre-labour rupture of membranes occurs, on-call consultant obstetrician will weigh the risk of prematurity and vertical transmission. Most recent viral load can be helpful
- if conservative management is chosen give erythromycin
- There is no contraindication to steroids for mother to reduce risk of RDS in baby

### TERM RUPTURE OF MEMBRANES

- In all cases of term pre-labour spontaneous rupture of the membranes, expedite delivery following woman's individual HIV care plan for birth
- If indicated in individual care plan, prepare for CS as soon as the zidovudine infusion is commenced at initial rate. Do not wait to complete before delivering baby
- If pre-labour rupture of membranes occurs after 34 weeks' gestation expedite delivery

## CAESAREAN SECTION

### Preparation

- Midwife co-ordinator informs theatre team of woman's HIV status, which **must not** be recorded on theatre list
- For women who require intrapartum zidovudine IV
  - because delivery must occur during the zidovudine infusion, ensure first or very early on theatre list
- If first on list, admit night before for IV cannula before midnight. Woman must take oral antiretrovirals at usual times before CS even if nil-by-mouth
- Antibiotic prophylaxis is particularly important due to increased risk of postpartum fever

### Surgery

- Administer prophylactic antibiotics – see **Caesarean section** guideline
- Keep surgical field as haemostatic as possible
- Delay membrane rupture as long as possible
- All healthcare professionals performing or assisting at CS where woman is known to be HIV positive should wear double gloves to reduce risk of transmission

## AFTER DELIVERY

### Mother

- Advise woman not to breastfeed
- Prescribe cabergoline 1 mg single dose first day postpartum to all mothers to inhibit lactation
  - maternal hypertension is a contraindication
- On postnatal ward, follow infection control procedures
  - woman may need a side ward
- Follow mother's individualised HIV care plan with regard to discontinuing antivirals
- Ensure woman has follow-up with her HIV physician and team in 2 weeks

## Baby

- Bath the baby and remove any secretions in mouth or nose with gentle wiping
- Contact neonatal team while mother still on delivery suite
- **High-risk** (maternal viral load >50 copies/mL or unknown): give baby zidovudine, lamivudine and nevirapine <2 hr from birth
- **Low-risk** (maternal viral load <50 copies/mL in last 4 weeks): give baby zidovudine <4 hr of delivery
- Take 5 mL EDTA sample from mother to go with baby's sample for HIV DNA PCR testing
- For neonatal care see Staffordshire, Shropshire & Black Country Newborn and Maternity Network **Neonatal HIV** guideline (if used locally)

### COMMUNICATION WITH WOMAN

- Inform woman that:
  - giving birth is generally very safe for both her and her baby
  - there is a higher likelihood of a normal birth with less intervention among women who plan to give birth at home
  - there are rare events that, if occurring at home, may have worse outcome for mother and baby than if occurring in hospital

*Midwives undertaking home births must be competent in obstetric and neonatal emergencies and must attend annual mandatory training*

- **34–36 weeks' gestation:**
  - carry out risk assessment and discuss home birth arrangements/birth plan
- **36–37 weeks' gestation:**
  - check and arrange delivery of home birth equipment to woman's home
  - Women **must be** informed of possible complications during labour and delivery which may necessitate transfer to hospital via ambulance
  - midwife must document in detail that discussion has taken place

*If, at any time, woman's risk category changes, appropriate referral must be made*

### Referral for home birth

- On confirmation of pregnancy, woman can either refer herself to a community midwife who is attached to a GP surgery, or ask GP to refer her

### MANAGEMENT PLAN

#### Community midwife

- Take a comprehensive booking history and perform risk assessment
- Offer woman a choice of planning birth at home, in a midwife-led unit or in an obstetric-consultant-led unit, according to assessed risk
- Provide antenatal care
- Provide contact details, together with those of the local maternity unit and document in maternal healthcare record
- Arrange a dating scan. Subsequent mid-trimester scan will be arranged
- Encourage woman to attend regular antenatal visits as per local care pathways
- Complete notification of home birth as per local policy
- While home birth is predominantly a choice available for women meeting the low-risk criteria, occasionally women who **do not** fit these criteria may request a home birth. In these cases, see **High-risk care** below

#### Pethidine

- Follow local policy for making pethidine available
- Midwife checks and administers the injection of pethidine according to NMC standards for medicines management (2008) and NMC Rules and Standards (2012)

#### Home birth cover

- Woman contacts the maternity hospital, as discussed during her birth plan visit
- Maternity unit will contact midwife as per local arrangements
- Community midwife will ensure all equipment is available and attend woman
- refer to local Lone worker policy
- A second midwife will be requested by the midwife at a time she considers appropriate

#### Intrapartum care at home birth

- First midwife is responsible/accountable for care in labour and delivery
- Second midwife attends and supports first midwife during delivery and with any obstetric/neonatal emergency as required
- Intrapartum care record is used to record progress of labour and delivery

- Intrapartum auscultation of the fetal heart using a sonic aid – see **Intermittent auscultation** guideline. If deviations from normal are identified at any time during home birth, midwives must act accordingly – see **Maternal transfer** guideline (or follow local practice) and **NMC midwives rules**
- Inform local maternity hospital when labour and placenta delivery are complete

### Born before arrival

- If born at home, unattended by a midwife, follow local **Born before arrival** policy
- Consider safeguarding issues. Depending on condition of woman and/or baby, admission to hospital via paramedic ambulance may be necessary

## POSTNATAL CARE AT A HOME BIRTH

### Mother

- As routine, record a full set of maternal observations
- Initiate skin-to-skin contact and breast or bottle feeding according to woman's preference and document time – see Staffordshire, Shropshire & Black Country Newborn and Maternity Network **Breastfeeding** guideline or follow local practice
- If breastfeeding, arrange breastfeeding support
- Suture if required, see **Perineal trauma suturing (tears and episiotomy)** guideline
- Assist mother with personal hygiene
- If the woman is Rhesus negative, make arrangements to check cord blood and Kleihauer results, and to administer anti-D if required
- Provide local contact numbers and tell mother who to contact for emergency medical relief (e.g. 999)

### Baby

- As routine following delivery:
  - obtain parental consent and administer vitamin K (Konakion® MM paediatric) 1 mg in 0.1 mL IM

### General

### First midwife

- Arranges home visit for next day or later that day if required (depending on time of delivery)
- Returns equipment to local maternity unit
- Obtains NHS number for baby
- Records delivery in maternal healthcare record
- Initiates Red Book
- Restocks home birth bag as per local practice and records this has taken place
- Ensures neonatal resuscitation equipment is clean, complete and signed back in as per local practice
- On-call community midwives inform local maternity unit that they have returned home
- Arrange hearing screening for baby using appropriate request form
- Arrange appointment for initial examination of the newborn to take place
- ≤72 hr of birth as per local policy
- Inform woman's GP that home delivery has taken place

### HIGH-RISK CARE

- Women who are booked for high-risk care may also wish to deliver their baby at home, and have a right to do so
- Midwives discuss woman's wishes with her in a non-judgemental manner, providing detailed information, options for care and outlining any potential risks, so that the woman may make a fully informed decision about place of delivery
- If in line with local policy, offer high-risk woman the opportunity to deliver on the midwifery-led unit as a safer option, in agreement with her consultant, named midwife and unit manager
- A professional midwifery advocate (PMA) must be available (contact via delivery suite) at all times for advice

***Good preparation is key.***

***Midwives must not practice outside the scope of their abilities (NMC rules). He/she must ensure PMA is contacted and must not be drawn into unsafe practice***

- Consultant providing care will discuss woman's wishes with her during antenatal period
- Community midwife must make every effort to attend the appointment to ensure all parties have explored the risks of home birth. If it is not possible for the community midwife to attend the appointment, she should discuss with consultant before appointment date
- If a woman chooses not to accept the advice provided by the consultant and community midwife, make an appointment for her to meet with PMA or attend a birth choice clinic (if available locally) to ensure all possibilities have been explained

### Documentation

- Document all discussions between mother/community midwife/consultant/PMA in the maternal healthcare record
- Formulate a detailed plan (agreed by all parties) and place copies in:
  - woman's hand held records
  - local maternity unit
  - woman's healthcare record

## HYPERTENSION IN PREGNANCY • 1/7

Hypertensive disorders during pregnancy occur in women with pre-existing primary or secondary chronic hypertension, and in women who develop new-onset hypertension in the second half of pregnancy (gestational hypertension)

***If occurring with significant proteinuria it is termed pre-eclampsia – see Eclampsia and Severe pre-eclampsia guidelines***

### DEFINITION

#### Chronic hypertension

- Hypertension present at booking visit or <20 weeks' gestation or if woman already taking antihypertensive medication when referred to maternity services. Can be primary or secondary in aetiology

#### Gestational hypertension (GHT)

- New hypertension presenting >20 weeks' gestation without significant proteinuria

#### GHT with significant proteinuria

- New hypertension presenting >20 weeks' gestation with urinary protein:creatinine ratio >30 mg/mmol or a validated 24 hr urine collection result shows >300 mg protein

### Degrees of hypertension

Mild	Moderate	Severe
Systolic BP 140–149 mmHg Diastolic BP 90–99 mmHg	Systolic BP 150–159 mmHg Diastolic BP 100–109 mmHg	Systolic BP ≥160 mmHg Diastolic BP ≥110 mmHg

### RISKS

#### Woman

- Increase in lifetime risk of chronic hypertension and cardiovascular disease

#### Baby

- Higher rates of perinatal mortality, preterm and low birth weight

### PREVENTION OF GESTATIONAL HYPERTENSION

#### Risk factors

- High risk factors:
  - hypertensive disease during a previous pregnancy
  - chronic kidney disease
  - autoimmune disease e.g. systemic lupus erythematosus or antiphospholipid syndrome

- type 1 or type 2 diabetes
- chronic hypertension
- Moderate risk factors:
  - first pregnancy
  - age ≥40 yr
  - pregnancy interval of >10 yr
  - body mass index (BMI) ≥35 kg/m<sup>2</sup> at first visit
  - family history of pre-eclampsia
  - multiple pregnancy

#### Aspirin therapy

- Women with ≥1 high risk factors or ≥2 moderate risk factors of pre-eclampsia, start 75 mg aspirin daily from 12 weeks until delivery

**SYMPTOMS AND SIGNS**

- Advise woman to report any of the following to a healthcare professional:
  - headache
  - visual disturbance (blurring or flashing)
  - pain below ribs
  - sudden swelling of face, hands or feet
  - vomiting

**INVESTIGATIONS**

- BP and urinalysis on each visit to a healthcare professional

**TREATMENT**

**Antihypertensive treatment and prenatal counselling**

- Base antihypertensive treatment on pre-existing treatment, medication side-effect profile and risk of teratogenicity

- Stop angiotensin-converting enzyme inhibitors (ACEI) and/or angiotensin II receptor blockers (ARBs) **within 2 days** of notification of pregnancy and offer alternative medication
- ACEI and ARB carry an increased risk of congenital abnormalities
- Limited evidence shows no increased risk of congenital abnormalities with other antihypertensive treatments but discuss with healthcare professional responsible for managing the hypertension
- The antihypertensive medications commenced/used in pregnancy are methyldopa, labetalol and nifedipine
- Avoid anaemia – see **Anaemia in pregnancy** guideline

**Intrapartum care**

<b>Mild or moderate hypertension (BP ≤ 159/109 mmHg)</b>	<b>Severe hypertension (BP ≥ 160/110 mmHg)</b>
<ul style="list-style-type: none"> <li>● Continue antenatal antihypertensive treatment</li> <li>● Measure BP hourly</li> <li>● See <b>Epidural analgesia</b> guideline – <b>Investigations</b></li> <li>● If BP stable &lt;150 mmHg systolic, do not routinely limit duration of second stage</li> </ul>	<ul style="list-style-type: none"> <li>● Continue antenatal antihypertensive treatment</li> <li>● Measure BP continuously</li> <li>● If BP controlled &lt;150 mmHg systolic, do not routinely limit duration of second stage</li> <li>● If BP does not respond to initial treatment, advise operative birth</li> </ul>

**Postnatal care**

**Antihypertensive treatment**

- Continue antenatal antihypertensive treatment
- If methyldopa was used during pregnancy, stop within 2 days of birth due to risk of depression
- If no antenatal antihypertensive treatment was required, commence antihypertensive treatment only if BP ≥ 150/100 mmHg
  - Measure BP:
    - daily for first 2 days after birth
    - at least once 3–5 days after birth
    - as clinically indicated if antihypertensive treatment changed
  - Maintain BP at 140/90 mmHg
  - See **Breastfeeding advice for women taking antihypertensive medication** below

### Follow-up care

- At transfer to community care, ensure care plan in place, including:
  - who will provide follow-up care (including medical review if required)
  - frequency of blood pressure monitoring
  - thresholds for reducing or stopping treatment
  - indications for referral to primary care for blood pressure review
- If antihypertensive treatment is to be continued, offer medical review 2 weeks after transfer to community care
- Offer medical review at 6–8 week postnatal GP review
- If antihypertensive treatment is to be continued after the 6–8 week postnatal review, offer a specialist assessment of hypertension

### Breastfeeding advice for women taking antihypertensive medication

- If breastfeeding or expressing milk, avoid diuretic treatment
- Inform woman the following antihypertensive drugs have no known adverse effects on babies receiving breast milk:
  - labetalol
  - nifedipine
  - enalapril
  - captopril
  - atenolol
  - metoprolol
- Inform woman that there is insufficient evidence regarding the safety of babies receiving breast milk where mother is receiving:
  - ARBs
  - amlodipine

- ACEI other than enalapril and captopril
- Assess clinical wellbeing of baby, especially adequacy of feeding, at least daily for first 2 days after delivery

### CHRONIC HYPERTENSION

#### Antihypertensive treatment

- See **Antihypertensive treatment and prenatal counselling** above
- In uncomplicated chronic hypertension, maintain blood pressure at <150/100 mmHg
- In target-organ damage secondary to chronic hypertension (e.g. kidney disease), maintain BP at <140/90 mmHg
- Refer pregnant women with secondary chronic hypertension to a specialist in hypertensive disorders

#### Aspirin therapy

- 75 mg daily from 12 weeks until delivery

#### Antenatal care

- Consultant obstetrician as lead professional
- Plan additional antenatal consultations according to individual needs of woman and baby

#### Fetal monitoring

- At 28–30 and 32–34 weeks perform:
  - ultrasound for fetal growth and amniotic fluid volume assessment
  - umbilical artery Doppler velocimetry
- If results normal, do not repeat >34 weeks unless clinically indicated
- If fetal activity abnormal, perform electronic fetal monitoring – see **Electronic fetal monitoring (EFM)** guideline

**Timing of birth**

- Chronic hypertension with blood pressure <160/110 mmHg, with or without antihypertensive treatment:
  - do not offer delivery <37 weeks
- Chronic hypertension with blood pressure <160/110 mmHg >37 weeks, with or without antihypertensive treatment:
  - woman and obstetrician will agree timing of birth
- Severe, uncontrolled chronic hypertension:
  - offer delivery after a course of corticosteroids completed (if required)

**Intrapartum care**

- See **Intrapartum care** above

**Postnatal care**

- See **Postnatal care** above

**GESTATIONAL HYPERTENSION WITHOUT PROTEINURIA**

**Antenatal care**

- Assessment by middle grade obstetrician (ST3-7 or equivalent e.g. staff grade, clinical fellow) or consultant
- Consultant obstetrician as lead professional

**Assessment and antihypertensive treatment (see Antihypertensive treatment and prenatal counselling above)**

<b>Mild hypertension (BP 140/90–149/99 mmHg)</b>	<b>Moderate hypertension (BP 150/100–159/109 mmHg)</b>	<b>Severe hypertension (BP ≥ 160/110 mmHg)</b>
<ul style="list-style-type: none"> <li>● Do not admit to hospital</li> <li>● Do not treat hypertension</li> <li>● Measure BP weekly</li> <li>● Test for proteinuria at each visit using an automated reagent-strip reading device or urinary protein:creatinine ratio</li> <li>● Perform routine antenatal blood tests</li> <li>● If presenting at &lt;32 weeks or at high risk of pre-eclampsia, test for proteinuria and measure BP twice a week</li> </ul>	<ul style="list-style-type: none"> <li>● Do not admit to hospital</li> <li>● Treat with first-line oral labetalol to maintain BP at &lt;150/80–100 mmHg (monitor via community midwife or assessment unit)</li> <li>● Measure BP at least twice a week</li> <li>● Test for proteinuria at each visit</li> <li>● Test renal function, electrolytes, FBC, transaminases, bilirubin</li> <li>● If no subsequent proteinuria, no further blood tests required</li> </ul>	<ul style="list-style-type: none"> <li>● Admit to hospital</li> <li>● Keep mobile in hospital</li> <li>● Treat with first-line oral labetalol to maintain BP at &lt;150/80–100 mmHg</li> <li>● Measure BP ≥ 4 times daily</li> <li>● Test for proteinuria daily using an automated reagent-strip reading device or urinary protein:creatinine ratio</li> <li>● Test LFT, U&amp;E, FBC, transaminases, bilirubin at presentation and then monitor weekly</li> <li>● If receiving outpatient care after severe hypertension has been effectively controlled in hospital:                             <ul style="list-style-type: none"> <li>● measure BP and test for proteinuria twice a week</li> <li>● perform weekly blood tests</li> </ul> </li> </ul>

## Fetal monitoring

Mild or moderate hypertension (BP 140/90–159/109 mmHg)	Severe hypertension (BP ≥160/110 mmHg)
<ul style="list-style-type: none"> <li>● If diagnosis confirmed before 34 weeks, perform:                             <ul style="list-style-type: none"> <li>● ultrasound for fetal growth and amniotic fluid volume assessment</li> <li>● umbilical artery Doppler velocimetry</li> </ul> </li> <li>● If results normal, do not repeat after 34 weeks</li> <li>● If fetal activity abnormal:                             <ul style="list-style-type: none"> <li>● EFM</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● At diagnosis, if conservative management planned, perform:                             <ul style="list-style-type: none"> <li>● ultrasound for fetal growth, amniotic fluid volume assessment and umbilical artery Doppler velocimetry (not &gt;2 weekly)</li> <li>● EFM</li> </ul> </li> <li>● Do not repeat more than weekly if all fetal monitoring normal</li> <li>● Repeat EFM if any of the following:                             <ul style="list-style-type: none"> <li>● change in fetal movement reported by woman</li> <li>● vaginal bleeding</li> <li>● abdominal pain</li> <li>● deterioration in maternal condition</li> </ul> </li> <li>● If results of any fetal monitoring abnormal, inform consultant obstetrician</li> </ul>

### Timing of birth

- **GHT with blood pressure <160/110 mmHg**, with or without antihypertensive treatment
  - do not offer delivery before 37 weeks
- **GHT with blood pressure <160/110 mmHg after 37 weeks**, with or without antihypertensive treatment
  - woman and middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant agree timing of birth, and maternal and fetal indications for birth

- **Refractory severe gestational hypertension:**
  - offer delivery after a course of corticosteroids (if required) has been completed

### Intrapartum care for woman with GHT

- See **Intrapartum care** above

### Postnatal care

- See **Postnatal care** above

### Recurrence risk and long-term health risks

- Women who experienced gestational hypertension risk developing:
  - gestational hypertension in future pregnancy ranges from about 1 in 6 (16%) pregnancies to about 1 in 2 (47%) pregnancies
  - pre-eclampsia in future pregnancy ranges from 1 in 50 (2%) to about 1 in 14 (7%) pregnancies

### Long-term health risks of cardiovascular disease

- Women who have experienced gestational hypertension or pre-eclampsia have an increased risk of developing hypertension and its complications in later life

### Long-term risk of end-stage kidney disease

- Inform women with a history of hypertension without proteinuria and no hypertension at the postnatal review (6–8 weeks after delivery) that although the relative risk of end-stage kidney disease is increased, the absolute risk is low and no further follow-up is necessary

**GESTATIONAL HYPERTENSION WITH PROTEINURIA  
(PRE-ECLAMPSIA)**

**Introduction**

- Once a diagnosis of pre-eclampsia is made, risk of maternal and perinatal mortality and morbidity is increased (see **Severe pre-eclampsia** guideline)
- Clinical management is often determined by drawing a balance between maternal and fetal considerations. For example, the timing of birth depends on mother's condition and risk of intrauterine death of baby or, if born, neonatal death or morbidity as a result of prematurity

**Antenatal care** (see **Antihypertensive treatment and prenatal counselling** above)

<b>Mild hypertension (BP 140/90–149/99 mmHg)</b>	<b>Moderate hypertension (BP 150/100–159/109 mmHg)</b>	<b>Severe hypertension (BP ≥160/110 mmHg)</b>
<ul style="list-style-type: none"> <li>● Do not treat hypertension</li> <li>● Measure BP ≥4 times a day</li> <li>● Test kidney function, electrolytes, FBC, LFT twice a week</li> </ul>	<ul style="list-style-type: none"> <li>● Treat with first-line oral labetalol to keep BP &lt;150/80–100 mmHg</li> <li>● Measure BP ≥4 times a day</li> <li>● Test kidney function, electrolytes, FBC, LFT 3 times a week</li> </ul>	<ul style="list-style-type: none"> <li>● Urgent referral to hospital</li> <li>● Obstetric middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant assessment</li> <li>● Consultant obstetrician as lead professional</li> <li>● Treat with first-line oral labetalol to keep BP &lt;150/80–100 mmHg</li> <li>● Measure BP &gt;4 times daily depending on clinical circumstances</li> <li>● Test kidney function, electrolytes, FBC, LFT 3 times a week</li> <li>● VTE risk assessment</li> </ul>

**Timing of birth**

**<34 weeks**

- Aim to manage conservatively until 34 weeks
- Obstetric consultant or middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) to assess daily to review management plan
- If delivery likely <35 weeks' gestation, give corticosteroids
- Offer birth (after discussion with neonatologist and anaesthetist) if:
  - severe refractory hypertension
  - maternal or fetal clinical condition deteriorates

**34–36<sup>+6</sup> weeks**

- If required course of corticosteroids completed, recommend birth after 34 weeks if pre-eclampsia with severe hypertension
- If pre-eclampsia with mild or moderate hypertension, offer birth at 34–36<sup>+6</sup> weeks depending on maternal and fetal condition, risk factors and availability of neonatal intensive care

**>37<sup>+0</sup> weeks**

- Recommend birth within 24–48 hr

### Fetal monitoring

- Ultrasound for fetal growth and amniotic fluid volume. Umbilical artery Doppler velocimetry at diagnosis if conservative management planned
- Do not repeat more than every 2 weeks
- EFM at diagnosis. Repeat if change in fetal movement reported by woman, vaginal bleeding, abdominal pain, deterioration in maternal condition
- In women with pre-eclampsia who have given birth, carry out a urinary reagent-strip test at the postnatal review (6–8 weeks after birth)
- In women who had pre-eclampsia and still have proteinuria (1+ or more) at postnatal review (6–8 weeks after birth) offer a further review at 3 months after birth to assess kidney function and consider referral for specialist renal assessment

### Intrapartum care

- Mild and moderate hypertension (140/90–159/109 mmHg)
- See **Intrapartum care** above

### Postnatal care

- See **Postnatal care** above

### Haematological and biochemical monitoring

- In women who have pre-eclampsia with mild or moderate hypertension, or after step-down from critical care:
  - measure platelet count, LFT and serum creatinine 48–72 hr after birth or step-down
  - if results are normal at 48–72 hr, do not repeat platelet count, transaminases or serum creatinine measurement
- If biochemical and haematological indices are improving but stay within the abnormal range in women with pre-eclampsia who have given birth, repeat platelet count, LFT and serum creatinine measurement as clinically indicated and at postnatal review (6–8 weeks after birth)
- If biochemical and haematological indices are not improving relative to pregnancy ranges in women with pre-eclampsia who have given birth, repeat platelet count, LFT and serum creatinine measurement as clinically indicated

## DEFINITION

Artificially initiated uterine contractions leading to progressive dilatation and effacement of the cervix and delivery of baby. Includes women with intact membranes and those with spontaneous rupture of membranes but who are not in labour

## INDICATIONS

### Prevention of prolonged pregnancy (term plus 10–14 days)

- Ultrasound at <20 weeks to confirm gestation reduces induction for perceived post-term pregnancy
- In uncomplicated pregnancies, offer induction of labour between term plus 7–14 days
- Pre-labour rupture of membranes (>37 weeks' gestation) – see **Pre-labour rupture of membranes (PROM) at term** guideline
- Intrauterine fetal death – see **Perinatal bereavement** guideline

### Other (this list is not exhaustive)

- Diabetes
- Hypertension
- Fetal growth restriction (FGR)
- Antepartum haemorrhage (APH)
- Multiple pregnancy
- Cholestasis
- Previous stillbirth
- Breech presentation
- Previous caesarean section (CS)

### Maternal request <41 weeks' gestation

- Do not offer routinely at maternal request alone
- Consider when compelling psychological or social reasons >40 weeks. Refer to a consultant clinic

## CONTRAINDICATIONS

- Severe FGR with confirmed fetal compromise (requires LSCS)

- History of precipitate labour
- routine induction of labour to avoid unattended birth not recommended
- Macrosomia – in the absence of other indications, other than healthcare suspicion is not an indication for induction

## PREGNANCY

### >42 WEEKS' GESTATION

- Advise women choosing to continue pregnancy >42 weeks, despite adequate explanation of risks, to closely monitor fetal movement pattern
- Refer to obstetric consultant for plan of care
- ultrasound estimation of maximum amniotic pool depth
- umbilical artery Doppler study
- electronic fetal monitoring (EFM)

## METHODS OF INDUCTION OF LABOUR

### Membrane sweeping

- Before considering other methods for induction, offer membrane sweep according to local practice. This has been shown to increase probability of labour starting naturally within 48 hr
- May be carried out in woman's home, antenatal clinic or hospital
- Offer nulliparous membrane sweep at 40 and 41 weeks
- Offer parous women membrane sweep at 41 weeks
- If labour does not start spontaneously additional membrane sweeps may be offered

**Membrane sweep not recommended if membranes have ruptured**

### Midwife/doctor will:

- Provide full explanation of procedure
- Obtain and record consent

## INDUCTION OF LABOUR • 2/5

- Inform woman that membrane sweeping is not associated with an increase in maternal or neonatal infection but the procedure can result in increased levels of discomfort and bleeding
- Provide 'Induction of labour' leaflet (if available locally)
- Ensure woman has relevant contact telephone numbers

### MEDICAL INDUCTION OF LABOUR

- In nulliparous or multiparous women with intact membranes with unfavourable cervix, use prostaglandin in preference to oxytocin unless specific clinical contraindications

- In nulliparous or multiparous women with ruptured membranes regardless of cervical status, prostaglandin or oxytocin are equally effective in induction of labour

### Midwife/doctor will:

- Provide full explanation of procedure, including associated risks of hyperstimulation
- Obtain and record consent

Nulliparous women	Multiparous women
<ul style="list-style-type: none"> <li>● Administer first dose prostaglandin:                             <ul style="list-style-type: none"> <li>● 2 mg gel <b>or</b></li> <li>● 3 mg tablet <b>or</b></li> <li>● 10 mg dinoprostone (Propress®) pessary (times will be unit specific)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Administer first dose prostaglandin                             <ul style="list-style-type: none"> <li>● 1 mg gel <b>or</b></li> <li>● 3 mg tablet <b>or</b></li> <li>● 10 mg dinoprostone (Propress®) pessary (times will be unit specific)</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● Midwife/doctor will perform vaginal examination to assess state of cervix, whether contracting or not:                             <ul style="list-style-type: none"> <li>● 6 hr after initial dose of gel or tablet</li> <li>● 24 hr after initial dose of dinoprostone (Propress®) pessary</li> </ul> </li> <li>● If, at next examination, artificial rupture of membranes (ARM) is possible, perform regardless of Bishop's score</li> <li>● If ARM not possible, administer second dose but withhold if woman is contracting regularly, painfully and palpably</li> </ul>	
<p><i>For primips, maximum dose of prostaglandin is 3 mg gel, 6 mg tablet or 10 mg dinoprostone (Propress®) pessary in 24 hr</i></p>	
<p><i>For multips, maximum dose of prostaglandin is 2 mg gel, 6 mg tablet or 10 mg dinoprostone (Propress®) pessary in 24 hr</i></p>	

### Contraindications to induction of labour with prostaglandin

- Sensitivity to prostaglandins
- Clinical suspicion or definite evidence of pre-existing fetal distress
- Uncontrolled asthmatic
- Contraindications to vaginal birth e.g. uncontrolled severe pre-eclampsia, mechanical obstruction to delivery, placenta praevia

### Relative contraindications

- Previous CS – see **Vaginal birth after caesarean section** guideline
- Predisposition to uterine rupture
- Acute cervicitis and vaginitis

## INDUCTION OF LABOUR • 3/5

### Inducability rating (modified Bishop's score)

For the purpose of this guideline modified Bishop's score is used to assess cervical condition

Cervical feature	Pelvic score (circle appropriate number)			
	0	1	2	3
Cervix position	Post	Central	Anterior	–
Consistency	Firm	Medium	Soft	–
Length (cm)	3	2	1	0
Dilatation (cm)	0	1–2	3–4	5+
Station* to spines	-3	-2	-1	0+

\*Station is measured in cm relative to ischial spines

### OXYTOCIN

- After ARM or spontaneous rupture of membranes, discuss commencement of oxytocin with woman and obstetric medical staff – see **Oxytocin** guideline for dose regimen

**Do not begin oxytocin infusion until 6 hr elapsed following administration of prostaglandin gel or tablets, or 30 min after removal of dinoprostone (Propress®) pessary**

### ANTENATAL MANAGEMENT AND BOOKING OF PLANNED INDUCTION OF LABOUR (LOW-RISK PREGNANCIES)

41 weeks

#### Community midwife/doctor will:

- Perform routine antenatal assessment, to include:
  - blood pressure
  - urine for proteinuria and glycosuria
  - measure fundal height and plot on growth chart
  - check position of baby
  - auscultate fetal heart and enquire about fetal activity

- Following explanation of procedure, perform membrane sweep and inform woman of findings
- Explain she may experience discomfort and the passing of a show and advise to contact maternity unit if she experiences bleeding, spontaneous rupture of membranes, abdominal pain or contraction
- Arrange admission date and time for induction at 40 weeks plus 7–14 days' gestation
- Provide 'Induction of labour' information leaflet (if available locally)
- Record all discussions indicating woman's understanding of her plan of care

### ADMISSION AND MANAGEMENT OF PROSTAGLANDIN INDUCTION (LOW-RISK PREGNANCIES)

- Admit and perform general observations:
  - temperature
  - pulse
  - blood pressure
  - respiratory rate and document MEOWS score
  - repeat in accordance with local guidance
  - urinalysis
  - full antenatal examination

- Obtain and review full history, confirm gestation and reason for induction and carry out:
  - abdominal examination to determine lie and fifths of the head palpable in the abdomen
  - fetal heart assessment
- Give woman information regarding discomfort associated with procedure and pain relief options
- Explain there is no association with an increase in maternal or neonatal infection or bleeding
- Obtain consent
- Perform external EFM for 20 min to confirm fetal wellbeing
- Assess cervix using Bishop's score and record findings
- Administer prostaglandin as per local guidance
- Advise woman to remain recumbent for 30–60 min
- Provided initial monitoring on admission is within normal parameters, reassess fetal wellbeing:
  - EFM trace of 20 min once contractions have commenced
  - discontinue EFM after 20 min providing fetal heart remains within normal parameters
- If, at any time throughout the procedure, fetal heart rate is outside normal parameters, continue EFM and inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant
- Encourage woman to mobilise freely, eat and drink normally, and consider using non-pharmacological pain relief/simple analgesia

### Uterine hypercontractility with prostaglandin

- In the presence of abnormal fetal heart rate patterns and uterine hypercontractility, consider administration of subcutaneous terbutaline 250 microgram

### ANTENATAL MANAGEMENT OF PLANNED INDUCTION OF LABOUR (HIGH-RISK PREGNANCIES)

- Consultant obstetrician will be lead professional for all cases
- Obstetric medical staff will decide place of induction (routine antenatal wards are not appropriate in certain circumstances e.g. vaginal birth after CS)
- Obstetric medical staff will determine and document frequency of maternal and fetal observations required over and above those for low-risk pregnancy
- Discuss plan of care with all high-risk women to decide timing and method of induction of labour
- Provide 'Induction of labour' information leaflet (if available locally)
- Follow procedure in **Low-risk pregnancies**

### INDUCTION OF LABOUR WITH A PREVIOUS CS

- The decision to induce a woman with a previous CS should be made by an obstetric consultant following a vaginal examination. Vaginal examination is useful in determining method of induction
- Offer membrane sweeping
- Discuss risks of induction of labour with woman (e.g. failed induction/repeat CS, scar rupture) and document in maternal healthcare record
- risk of scar rupture is approximately doubled with ARM and oxytocin and increased five-fold with prostaglandin. If both oxytocin and prostaglandin used risk is further increased 9–15 times
- With a relatively low modified Bishop's score, consider proceeding directly to ARM or use of transcervical catheter induction – see **Transcervical catheter induction** guideline
- Discuss and document individualised management plan using local proforma

- For women with a previous CS undergoing induction, insert cannula and take blood for FBC and group and save
- Inform obstetric anaesthetic middle grade (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- EFM continuously from onset of even mild contractions or any pain until delivery
- If only indication for induction is post-term pregnancy, consider monitoring fetal wellbeing >42 weeks' gestation

### **FAILED INDUCTION OF LABOUR**

- If amniotomy still not possible after 2 doses of prostaglandin gel or tablet or 24 hr dinoprostone (Propress®) use, induction of labour has failed
- give third dose of prostaglandin (1 mg gel or 3 mg tablet) or extend dinoprostone (Propress®) use for a further 6 hr
- If amniotomy still not possible, discuss with consultant obstetrician and arrange review
- Discuss the following options with the woman:
  - CS
  - transcervical catheter induction (if used locally) – see **Transcervical catheter induction** guideline
  - abandon process and repeat after an interval i.e. 24 hr

### INTRODUCTION

- Unless otherwise stated, this guideline applies to healthy term infants
- Where expressed breast milk (EBM) is mentioned, it refers to mother's own EBM

### ANTENATAL PERIOD

- Promote the value of breastfeeding as protection from infection, comfort and food
- If woman chooses to formula feed, give support and information on safe practices – see **Formula feeding**
- Avoid asking feeding intention, which can limit further discussion and does not allow for change of mind

### SKIN-TO-SKIN CONTACT

- Skin-to-skin contact immediately after birth (following delayed cord clamping) promotes an early feed
- Aim to provide an uninterrupted period of skin-to-skin contact in a quiet environment for 1 hr, or at least until after first feed
- Ensure mother comfortable and avoid excessive heat-loss in baby
- Throughout period of skin-to-skin contact continue normal observations of baby's:
  - temperature
  - breathing
  - colour
  - tone
- Continue to observe mother
- Remove baby promptly if health of mother or baby gives rise for concern
- Ensure baby cannot fall to the floor, or become trapped in bedding or by the mother's body
- Position baby ensuring head is supported so baby's airway does not become obstructed

- Never interrupt skin-to-skin contact to perform routine procedures (e.g. weighing baby)
- Where condition of mother or baby requires medical intervention, this will take precedence over immediate skin-to-skin contact
- commence contact once condition of mother and baby stable
- Reassure woman undergoing a caesarean section (CS) that skin-to-skin contact will be initiated as soon as possible after birth, in theatre or recovery room, depending on clinical situation
- Document skin-to-skin contact and record reason for any delay in maternal healthcare record
- If mother wishes to end skin-to-skin contact before first breastfeed, advise that ending contact for anything other than a short time may be detrimental to initiation of breastfeeding. Document mother's decision in maternal healthcare record
- Allow mother to transfer to postnatal ward with baby still in skin-to-skin contact
- Women who choose to formula feed to give first bottle feed in skin-to-skin contact

### Benefits

- Keeps baby warm
- Promotes bonding
- Helps baby's heartbeat and breathing to settle after birth

### POSTNATAL WARD

- Check baby's temperature was normal before transfer
- On admission to postnatal ward, observe colour and general appearance of baby
- If baby is well and not showing signs of wanting to feed, discuss early feeding cues with woman

- When baby showing feeding cues, offer assistance to breastfeed
- Unless it is necessary, for clinical reasons, to separate mother and baby, mother has primary responsibility for baby's care on postnatal areas. Baby will remain with mother 24 hr/day to allow her to recognise feeding cues (see **Responsive feeding**) and encourage night-time breastfeeds/formula feeds

***Do not routinely separate mother and baby at night whether formula-fed, breastfed or delivered by CS***

- If mother requests separation from baby for 'settling' by staff, explain the benefits of staying close to baby and document decision and length of separation in maternal healthcare record. Return baby to mother as soon as baby settles

### RESPONSIVE FEEDING

- Encourage woman to breastfeed not only for nutrition, but for comfort and calming of baby, or if woman has full breasts or needs to rest
- Ensure mother understands the nature of feeding cues, the importance of quick response (rather than waiting until baby cries) and is aware of normal feeding patterns, including cluster feeding and 'growth spurts'. This is applicable to breast and formula-fed babies
- Unless, clinically inappropriate, encourage responsive feeding, allowing baby to feed for as long and as often as he/she wants. Where clinical procedures are necessary, they should not interfere with this process
- Observation of the sleepy baby (for either method of feeding) is important to ensure vital signs such as colour, respiration rate, heart rate and temperature are stable and that there are no signs of hypoglycaemia

### Breastfed babies

- Early and frequent breastfeeding has many benefits including:
  - enhances milk supply – the more milk removed from the breast, the more milk the mother will produce
  - reduces incidence of physiological jaundice
- Inform mother that it is acceptable to wake baby for feeding if her breasts become overfull. Explain the importance of night-time feeding for milk production
- Length of individual feeds will vary considerably. The length of the feed is determined by the rate of milk transfer from mother to baby. Encourage mother to allow baby to empty the first breast before offering the second
- Babies who are not removed from the breast but allowed to finish a feed spontaneously are more likely to take the high fat hind milk which will encourage satisfaction and weight gain

### Formula-fed babies

- After explaining the avoidance of 'over feeding', encourage mothers to feed in the same way taking amounts of milk that the baby wishes at each feed, and allowing baby to 'pace' the feed
- ensure number of feeders are limited

### BREASTFEEDING

- Human milk is important in establishing enteral nutrition
- To promote optimum health benefits, babies should be breastfed exclusively until aged 6 months and should continue to breastfeed until aged 2 yr
- Frequent feeds during the initial period will help prevent breast engorgement and encourage a good milk supply
- Midwife or skilled support worker to be available during mother's hospital stay to assist with breastfeeding
- support should also be available to mothers who choose to deliver at home

**Information for mother**

- Give mother information on how to obtain advice and support in hospital and at home
- Give verbal and written information on how to recognise effective feeding (UNICEF 'Recognising breastfeeding is going well' tool if available locally). Including signs that baby is receiving sufficient milk and what to do if not
- Recognise when breastfeeding not progressing normally e.g. sore nipples, breast inflammation

**Health benefits**

Baby	Mother
<ul style="list-style-type: none"> <li>● Reduced risk of:                             <ul style="list-style-type: none"> <li>● gastroenteritis</li> <li>● diarrhoea</li> <li>● urinary tract infection</li> <li>● chest infection</li> <li>● ear infection</li> <li>● obesity</li> <li>● diabetes</li> <li>● leukaemia</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Reduced risk of:                             <ul style="list-style-type: none"> <li>● ovarian and breast cancer</li> <li>● osteoporosis</li> </ul> </li> </ul>

**Initiating breastfeeding immediately after delivery**

- Encourage mother to hold baby (skin-to-skin contact) in a calm environment as soon as possible after delivery – see **Skin-to-skin contact**
  - Midwife will assist with first breastfeed as soon as baby shows interest
  - following a period of uninterrupted skin-to-skin contact many babies will self-attach
  - Early suckling helps promote uterine contraction, facilitating early passage of meconium and baby's blood glucose stabilisation
  - If first feed not achieved ≤4 hr, start active intervention – see **Healthy term baby who is slow to establish feeding**
- if necessary for clinical reasons, trained midwife or neonatologist will make the decision to offer supplementary feeds after discussion with parents
  - Before introducing artificial milk to breastfed babies, encourage mother to express breast milk to be given by feeding cup or syringe to reduce the need for artificial feeds
  - If supplements of formula are given, provide optimal care and support, and review each feed to ensure:
    - minimal formula use
    - maximum breast milk use
    - support to increase milk production
    - cup feeding rather than teat feeding
    - support to express and stimulate breasts
  - This proactive approach will reduce the need to offer artificial feeds and help to support mother's lactation

**Exclusive breastfeeding/artificial supplements**

- Unless medically indicated or is parents' fully informed choice, do not give food or drink (including water or artificial feed) other than breast milk to newborn breastfeeding infants

### How to breastfeed and maintain lactation

#### Correct positioning and attachment

- Good positioning and attachment are key to successful breastfeeding. It ensures:
  - good milk supply and transfer from mother to baby
  - prevents sore nipples
  - pain-free feeding
- Poor positioning and attachment may result in unsettled baby in immediate postpartum period. Assist mother to attach baby to breast correctly
- Document assistance given and outcome in appropriate healthcare record

#### Avoid teats and dummies

- Teats and dummies can hinder baby's ability to attach to the breast while learning to breastfeed in the early weeks and can interfere with responsive feeding

#### Assessment

- Midwife will assess breastfeeding daily in hospital, and on Day 3 and Day 5, to determine whether effective milk transfer is taking place and if further support required
- Document findings using local breastfeeding assessment tool
- If assessment indicates a potential feeding problem, observe a full breastfeed and document
- If mother experiences difficulty breastfeeding, consider referral to the maternity infant feeding team

#### Expressing breast milk

- It is important that mothers understand why and when hand-expressing is useful
- In hospital: As routine, before transfer home, teach mother to hand-express breast milk and, if available locally, give information leaflet

- Home birth: Instruct mother as soon as possible after birth
- Offer a visit by community staff

#### Preterm/sick baby

- Encourage mothers who are separated from their babies to begin expressing milk as soon as possible after birth as early initiation has long-term benefits for milk production
- Neonatal nurse caring for baby, and mother's midwife, will show mother how to express milk by hand and by pump
- If available locally, give mothers the **How to express your breast milk** leaflet
- If baby very preterm or very low birth weight, more frequent expressing is advised (8–12 times in 24 hr)
- If baby known to be at risk of developing hypoglycaemia is receiving care on the postnatal ward, midwife responsible for mother and baby will assist in initiating and maintaining lactation
  - practical care and help may be delegated to a skilled maternity support worker or healthcare assistant, but the overall responsibility remains with the midwife
- See also the following guidelines:
  - **Promotion, initiation and maintenance of lactation in the mother of a preterm or sick infant** guideline (if available locally)
  - **Breastfeeding** guideline, **Breast milk expression** guideline, **Breast milk handling and storage** guideline and **Hypoglycaemia** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)

**Reasons why baby may not get enough breast milk** (Note: several factors may contribute in any one situation)

<b>Factors related to breastfeeding</b>	<b>Other factors</b>	<b>Factors occasionally associated with breast milk insufficiency</b>	<b>Factors rarely associated with breast milk insufficiency</b>
<ul style="list-style-type: none"> <li>● Poor attachment</li> <li>● Delayed start in breastfeeding</li> <li>● Inefficient suckling</li> <li>● Infrequent feeds</li> <li>● Scheduled feeds</li> <li>● Short feeds</li> <li>● Supplementary feeds</li> <li>● Use of a teat</li> <li>● Use of a dummy</li> </ul>	<ul style="list-style-type: none"> <li>● Lack of confidence in mother, either herself or those around her (indirectly)</li> <li>● Tiredness, stress, worry (indirectly)</li> </ul>	<ul style="list-style-type: none"> <li>● Dislike of breastfeeding (indirectly)</li> <li>● Medication (e.g. contraceptive pill, diuretics)</li> <li>● Pregnancy</li> <li>● Alcohol/smoking</li> <li>● Prematurity, illness/abnormality in baby</li> </ul>	<ul style="list-style-type: none"> <li>● Retained products of conception</li> <li>● Rejection of baby</li> <li>● Severe malnutrition</li> <li>● Inadequate breast development</li> </ul>

**Assessment of breastfeeding**

**At each postnatal visit/check**

Abnormal findings trigger further action, see **Table** below

<b>Baby</b>	<b>Breasts</b>	<b>Breastfeeding</b>
<ul style="list-style-type: none"> <li>● Jaundiced and sleepy or difficult to rouse for feeding</li> <li>● Feeding &lt;8 times in 24 hr and/or not sustaining effective suckling pattern</li> <li>● Feeding very frequently i.e. consistently &gt;12 times in 24 hr</li> <li>● Consistently feeding for &gt;45 min or &lt;5 min</li> <li>● Unsettled after or during feed</li> </ul>	<ul style="list-style-type: none"> <li>● Engorgement or mastitis</li> <li>● Trauma to nipples:</li> <li>● nipples misshapen or 'pinched' at end of feeds</li> </ul>	<ul style="list-style-type: none"> <li>● Difficult attachment</li> <li>● No change in sucking pattern i.e. from initial rapid sucks with pauses and audible swallows</li> <li>● Baby 'fussy' at breast e.g. on and off the breast frequently during feed or refusing to breastfeed</li> </ul>

**HEALTHY TERM BABY WHO IS SLOW TO ESTABLISH FEEDING**

- Hypoglycaemia is unlikely to be a problem in healthy, term, well grown babies. These babies are low risk and routine blood glucose monitoring is unnecessary
- There is no evidence that long intervals between feeds in the first 24 hr will adversely affect healthy term newborns
- Some babies will feed <4 times in the first 24 hr. At least 3–4 feeds are expected in this period increasing to 8–12 thereafter in any 24 hr period
- Encourage healthy term babies to breastfeed in the first hour after birth, preferably on delivery suite or, if not, when baby is ready
- Some babies may not be keen to feed soon after delivery

- Encourage skin-to-skin contact between mother and baby (see **Skin-to-skin contact**)
- Encourage responsive feeding from birth (see **Responsive feeding**)
- Assist mother to initiate breastfeeding

### Artificial teats, dummies and nipple shields

- **Discourage the use of** artificial teats or dummies to breastfeeding babies during the establishment of breastfeeding. If a breastfed baby seems unsettled, it is more important to assess carefully and, if necessary, improve mother's feeding technique
- If parents wish to use teats, dummies or nipple shields, advise that dummies may have a detrimental effect on breastfeeding and lactation. Document discussion and parent(s) decision in postnatal record
- If baby requires additional fluids, give these by cup rather than by bottle to avoid nipple/teat confusion and encourage baby to develop correct tongue technique. Offering bottles may encourage baby to develop a preference for a teat
- **Nipple shields** are not recommended except in extreme circumstances and then only for as short a time as possible. If used, mother must be supervised by a skilled practitioner and given assistance to discontinue use as soon as possible. Explain the disadvantages to mother before commencing use, which may include:
  - nipple soreness caused by incorrect positioning and attachment
  - difficulty in improving positioning and attachment
  - reduced milk transfer to baby
  - increased risk of mastitis and breast abscess

### SUPPLEMENTATION

#### Medical indications for formula supplementation:

- HIV positive mother – see **HIV positive women** guideline

- Recent cytotoxic chemotherapy
- Certain medications – see <https://toxnet.nlm.nih.gov/newtoxnet/lactmed.htm>
- Active herpes on breast

#### Medical indications when formula supplementation may be necessary:

- Each baby and situation will be individually assessed. Indications include:
  - low birth weight <1500 g
  - metabolic disorders e.g. galactosaemia, maple syrup urine disease, phenylketonuria (PKU)
  - very preterm e.g. <32 weeks' gestation
  - at risk of hypoglycaemia e.g. preterm, small for gestational age, intrapartum stress, illness or maternal diabetes – if blood glucose fails to respond to optimal breastfeeding in spite of frequent effective suckling
  - persistent faltering growth/significant weight loss/hypernatraemia
  - breast abscess where there is pus coming from the nipple
- See **Breastfeeding** guideline and **Abstinence syndrome** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)
- When breastfeeding is temporarily delayed or interrupted, assist mother in establishing and maintaining lactation e.g. through manual or hand pump expression of milk, in preparation for resumption of breastfeeding

#### Documentation

- Record the following in maternal healthcare record:
  - discussions with parent(s) and informed consent obtained
  - reason for administering supplements, whether for clinical reasons or parents' request
  - supplements used
- Complete appropriate formula audit form and send to breastfeeding co-ordinator

### Baby has breastfed at delivery

#### ≤6 hr of birth

- Offer assistance with second breastfeed and document
- If baby sleeping or unwilling to feed, try again in 2 hr, or earlier if baby shows signs of hunger/wakefulness

### Baby has not fed since birth

#### At 4 hr

- Check heart rate, temperature, respiration rate, tone, colour and baby's general appearance again. If baby appears well and is still reluctant to feed, gently stimulate by:
  - unwrapping
  - resuming skin-to-skin contact
  - gentle massage
  - tempt at the breast
- Encourage mother to hand-express colostrum and give via cup/syringe (use of a breast pump is unlikely to obtain any colostrum)
- Review baby 2-hrly and repeat above process until baby has successfully breastfed
- Document all care given on a feeding chart

### Baby not taken feed by 12 hr

- If baby refuses to breastfeed, is unable to cup feed, or no colostrum available, midwife to assess baby to determine whether neonatal referral necessary
- Midwife/neonatologist and mother will formulate an individualised care plan
- If baby will not accept cup or small syringe feeds, partnership decision-making with neonatal medical colleagues is recommended to establish why and agree management plan. Explain suggested care plan to mother
- If baby is otherwise well and clinical signs are stable, blood glucose testing is not routinely required

- low-risk babies can mobilise alternative fuels like ketones as an energy source in the presence of low glucose
- Encourage mother to express milk 8 times in 24 hr, (including during the night) and give colostrum, when available, via cup or syringe or by direct expression into baby's mouth
- Stop monitoring temperature, respirations, heart rate and muscle tone once baby is feeding regularly and neonatal/midwifery staff are happy with progress
- Use feeding chart to assess whether feeding is established for a minimum of 24 hr
- Observe a breastfeed to ensure correct positioning and attachment and take a thorough breastfeeding history
- Complete feeding assessment sticker in woman's hand held notes

***Reluctance to feed may be the only sign of a sick baby. Consider the possibility of septicaemia or inborn errors of metabolism. Careful clinical surveillance is key to management***

### Amount not increasing

- If, after 12 hr, amount of colostrum only 'droplets', support mother and attempt to allay anxiety, which is helpful in establishing colostrum/milk flow by the natural release of oxytocin
- Increase expressing frequency from 8 to 10–12 times in 24 hr to ensure more stimulation of breasts and increased amounts given to baby
- explain carefully to mother the rationale for temporarily increasing expressing frequency
- Ensure mother is hand-expressing and using the pump effectively and safely
- All colostrum expressed must be given to baby
- Observe breastfeeding attempts and encourage skin-to-skin contact as much as possible in a dimly lit quiet environment

- Complete feed chart until breastfeeding established and record baby's urine and stool output. Report any deviations from normal to neonatal medical staff

**Breastfed baby 'sleepy' or 'reluctant to feed' in second 24 hr of life**

- Refer to the neonatal team for assessment
- Ensure there are no anatomical reasons preventing breastfeeding attachment e.g. cleft palate/tongue tie/ mother's breast or nipple anatomy
- Keep baby close to mother – skin-to-skin contact
- Provide emotional reassurance and support for mother
- Ensure mother understands feeding cues and is trying at every opportunity to breastfeed
- Observe and assess a full breastfeed, and offer breastfeeding support where necessary
- Avoid teats and dummies

- Continue to express and cup feed colostrum frequently
- Maintain feed chart until breastfeeding established
- Record plan (agreed with mother, midwife and neonatal team) in maternal healthcare record/neonatal notes
- Review progress with mother 12-hrly, ensuring baby has at least 8–12 feeds in this time period
- Observe wet and dirty nappies
- Consider biological nurturing positions

**Assessment of output**

- At each postnatal visit, enquire about babies output, together with ongoing monitoring by mother
- inadequate output (less than that specified – see **Table** below) triggers weight assessment and implementation of appropriate management plan
- The following findings are 'reassuring' in a breastfed baby. Any deviation from this should trigger further assessment

Age	Day 1–2	Day 3–4	Day 5–6	Day 7–28 and beyond
<b>Urine</b> Number of wet nappies per day	≥1–2 Urates may be present*	≥3 Nappies feel heavier	≥5	≥6 Heavy
<b>Stools</b> Number per day, colour, consistency	≥1 Dark green/black 'tarlike' (meconium)	≥2 Change in colour and consistency – brown/green/ yellow becoming looser ('changing stool')	≥2 Yellow May be quite watery	≥2 At least size of £2 coin, yellow and watery, 'seedy' appearance

\* Urates are normal bladder discharges in the first few days but persistent urates may indicate insufficient milk intake

- After 28 days, baby will establish own frequency of passing stools – may pass several per day or have several days' gap between

### FORMULA FEEDING

#### Early postnatal period

- Encourage mother to hold baby in a calm environment as soon as possible after delivery – see **Skin-to-skin contact**
- Explain how mother may obtain help with feeding while in hospital
- Ensure mother is supported with feeding until she feels confident
- Document formula feeding progress and all information given on the feeding care plan, and maternal healthcare record

#### Sterilising equipment

- Equipment that is used to store formula or feed an infant must be kept very clean
- Discuss with parents and offer the following information:
  - wash milk-related feeding equipment thoroughly in hot soapy water, using a clean brush, inside and out (especially the rim) before sterilising, until baby aged 1 yr
  - rinse well in clean water after washing
  - check equipment regularly for signs of deterioration. If any doubt, throw away

#### Technique

- **Boiling (saucepan)** – all equipment must be under the water level of the pan, with no air bubbles trapped inside
- Do not allow the pan to boil dry
- Boil for  $\geq 10$  min
- Keep pan covered with a lid until equipment is used
- **Steam or microwave sterilisers** – follow manufacturer's instructions
- **Chemical sterilisation** (tablets or fluid) – follow manufacturer's instructions
- ensure all equipment is under the fluid – with no trapped air bubbles – a plunger or plate can be used to keep items under water
- leave submersed for  $\geq 30$  min or as per manufacturer's instructions

- always wash hands before removing equipment from the steriliser
- make a fresh solution every 24 hr
- rinse equipment with cool boiled water (optional)

#### Formula milk preparation/storage

- Discuss with parent(s) and give leaflets on bottle feeding (if available locally)
- Demonstrate technique in early postnatal period before discharge home and, if necessary, again in the home environment. Document in maternal healthcare record
- Wash, rinse and dry hands thoroughly
- Use a clean work surface
- Use boiled tap water that has been left to cool for a few minutes ( $<30$  min – it should still be  $>70^{\circ}\text{C}$ ) – to reduce the risk of growth of bacteria found in infant formula powder
- Remind parents **not to use** bottled water due to variable mineral content
- **Make up a fresh bottle for each feed**, following preparation instructions on tin

**Storing prepared formula milk increases the risk of bacterial growth (powdered infant formula is not sterile)**

- If using cold water sterilisation, rinse feeding equipment with cooled boiled water (not water straight from tap), or shake solution off well
- Fill bottle to required mark – always water first before powder
- Add powder using only the scoop provided with the tin – level off with a plastic knife or spatula (1 scoop of powder to 30 mL of water)
- Place the disc, teat and cap onto bottle, and shake well until all powder has dissolved
- To cool the milk, hold bottle, with cap covering teat, under cold running water, or stand in jug of cold water
- Remind parents to check temperature of feed on inner wrist before giving to baby

- After feeding, throw away any unused milk
- Freshly prepared powdered formula milk will keep for 2 hr at room temperature, after which time, discard

### How to bottle-feed

- Hold baby upright with head supported in a comfortable neutral position (twisted neck makes swallowing difficult)
- To start the feed, brush the teat against baby's lips. Baby will open mouth with tongue down, which helps draw the teat in
- Keep teat full of milk, to avoid intake of air
- Hold bottle horizontal to the ground, tilting just enough to ensure baby is taking milk
- Babies feed in bursts of sucking with short pauses. In this position the milk will stop flowing when baby pauses – allowing baby to rest
- There should be bubbles in the bottle as baby feeds, if not, break the suction – you should see bubbles rushing back into the remaining milk
- Babies may need short breaks during the feed and may need to be winded
- Discuss responsive feeding – babies may take different amounts at different times – and the tin provides a guide only
- Advise parents not to try to give more milk at 1 feed in the hope baby will go longer before needing another feed. If baby is given more milk than necessary, he/she is likely to gain too much weight, or be sick
- Discuss feeding cues with parents so that they can recognise when their baby is hungry and encourage parents to stay close to baby in order to recognise these cues
- Encourage parents to hold baby close for feeding, offering eye contact. Skin-to-skin contact can be enjoyed
- As with breastfeeding, bottle feeding is a social interaction, not just for delivering nutrition. Aim to keep number of people feeding baby to a minimum
- **Never** leave baby alone with a bottle

### Feeding away from home

- It is safest to carry a measured amount of milk powder in a small clean and dry container, a flask of hot water that has been boiled and an empty sterilised feeding bottle
- Bottle must be cooled before feeding
- If the above is not possible, the feed can be prepared at home and cooled at rear of fridge. Take out of fridge before leaving home and carry in a cool bag with an ice pack. Use within 4 hr or, if destination reached within 4 hr, store at rear of fridge
- Never store feeds for >24 hr. It is always safer to make up a fresh bottle
- Ready-to-drink, formula milk is an alternative

### Formula-fed baby who is reluctant to feed

- Encourage skin-to-skin contact to stimulate feeding cue
- Offer frequent opportunities to feed
- If unwilling to suck from teat – try cup feeding
- small volumes in first 2 days is normal
- Clinically assess baby at 12 hr (colour, tone, behaviour, temperature, respiration, heart rate). If concerns, seek neonatal team assessment
- If baby not waking for feeds or sucking eagerly at the bottle by 36–48 hr, request neonatal team assessment
- Alternative feeding methods may be required based on clinical indication

### DISCHARGE AND FOLLOW-UP

#### Before discharge home

#### Rooming in

- Explain and encourage parent(s) to stay close to baby, sharing the same bedroom at night for first 6 months of life
- Ensure parent(s) are aware of the appropriate age for introducing complimentary foods

Breastfed baby	Formula-fed baby
<ul style="list-style-type: none"> <li>● Give mother:                             <ul style="list-style-type: none"> <li>● verbal and written information about local support groups, including contact details for voluntary breastfeeding counsellors, 24 hr national help lines including National Breastfeeding helpline, the Breastfeeding Network, National Childbirth Trust, La Leche League and Association of Breastfeeding Mothers</li> </ul> </li> <li>● Ensure breastfeeding mothers:                             <ul style="list-style-type: none"> <li>● know how to recognise signs that baby is receiving sufficient milk, and what to do if this is not the case</li> <li>● know how to recognise signs that breastfeeding is not progressing normally (e.g. sore nipples, breast inflammation)</li> <li>● are confident with positioning and attaching baby for breastfeeding</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Complete bottle-feeding checklist</li> <li>● Offer demonstration of sterilisation of equipment and reconstitution</li> <li>● Document in postnatal section of mother's healthcare plan</li> <li>● Mothers who do not wish this, or request early transfer home before it can be arranged should at least be knowledgeable in the preparation, administration and storage of formula milk</li> <li>● give <b>Bottle feeding</b> leaflet and <b>A guide to infant formula for parents who are bottle feeding</b> leaflet if available</li> <li>● Where English is not the first language, seek assistance from an interpreter to ensure effective demonstration/discussion</li> </ul>
<ul style="list-style-type: none"> <li>● Ensure mother understands feeding cues and the importance of responding, and awareness of normal feeding patterns, including 'cluster feeding' and 'growth spurts'</li> <li>● Provide written and verbal information on what constitutes healthy newborn behaviour and the signs that should cause concern</li> <li>● Advise mother to seek help urgently if baby is sleepy and reluctant to feed, after discharge home. Give midwives' contact numbers (24 hr/7 days), infant feeding co-ordinator, breastfeeding support workers, and other professional support</li> <li>● Home support is provided by community midwives, and breastfeeding support workers</li> <li>● Further telephone support is available evenings, nights and weekends from local and national helplines, and services available from local maternity units</li> <li>● In order to identify potential difficulties, at each contact, healthcare professional will ask about the progress of breastfeeding and assess adequacy of milk transfer within the first 48 hr and on (or around) day 5 using local breastfeeding assessment form – see assessment tool <a href="http://www.babyfriendly.org.uk">www.babyfriendly.org.uk</a></li> </ul>	

**Support in the community**

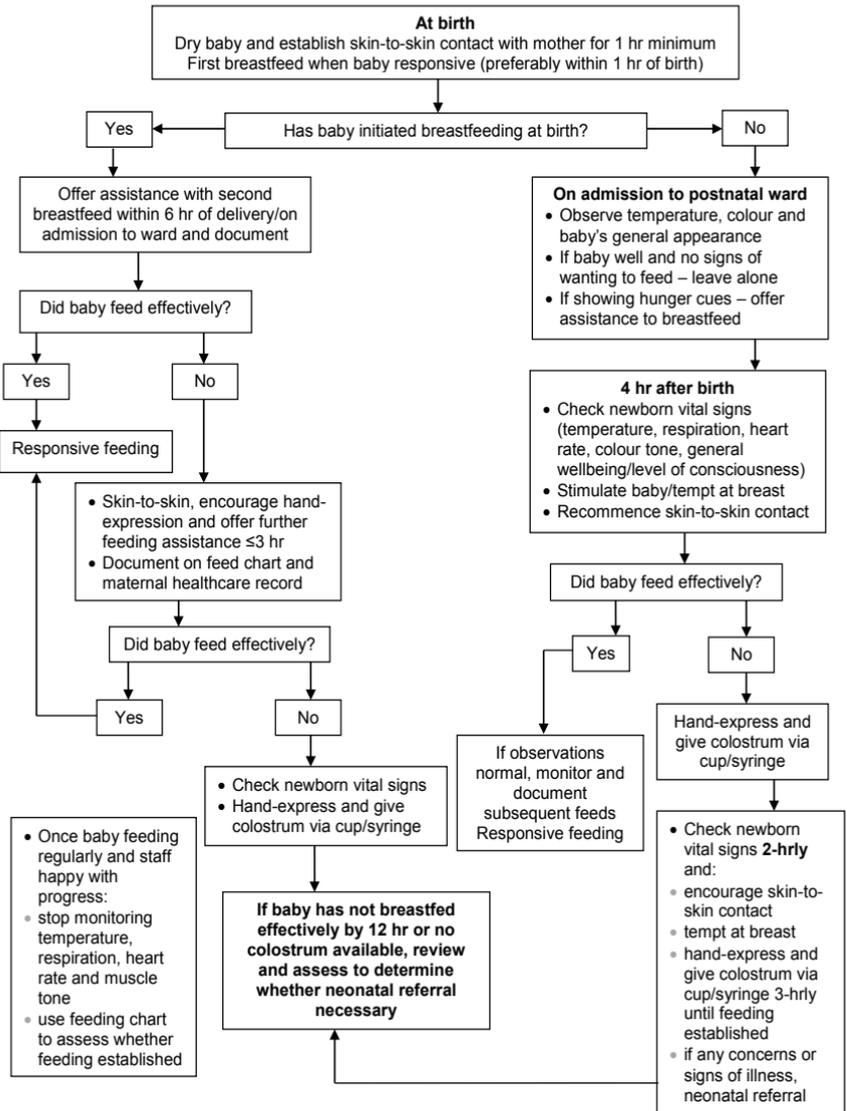
- Community midwives will check and reinforce learning
- Ensure particular care and planning so that mothers who begin breastfeeding but later change to formula feeding are given full support to breastfeed while they are doing so, but are provided with appropriate information about formula feeding when decision to change or combine is made

- Healthcare professionals and trained support workers will further instruct on expressing milk, explaining the importance of prevention and management of engorgement and mastitis
- If breastfeeding difficulties present, look for causal factors e.g. tongue tie, cleft palate

**Re-admission to hospital with feeding problems within first 28 days**

- Follow local follow-up process

Flowchart: Management of breastfeeding in healthy term babies



**DEFINITION**

- The interval monitoring of fetal heart using Doppler ultrasound or Pinard to assess fetal wellbeing in labour

**Who**

- Advise low-risk women to have baby's heart monitored by intermittent auscultation
- Risk factors below indicate the woman is not low-risk
- If risk factors present or structured intermittent auscultation not possible, use continuous electronic fetal monitoring (EFM) – see **Electronic fetal monitoring** guideline

**Contraindications**

**Maternal**

- Previous caesarean section/uterine scar
- Pre-eclampsia/eclampsia
- Recurrent antepartum haemorrhage
- Any vaginal blood loss other than a show
- Prolonged rupture of membranes >24 hr
- Prolonged pregnancy >42 weeks
- Diabetes or other significant medical disorders
- Raised blood pressure (see **Hypertension** guideline)
- Labour with oxytocin
- Abdominal pain without contractions
- Trauma/after a fall/RTC
- Cholestasis
- Previous stillbirth or early neonatal death

**Fetal**

- Intrauterine growth restriction/abnormal Doppler
- Macrosomia
- Prematurity <37 weeks' gestation
- Oligohydramnios/polyhydramnios
- Multiple pregnancy
- Abnormal presentation
- High (4/5–5/5 palpable) or free floating head in nulliparous woman
- Iso-immunisation
- Non-reassuring antenatal EFM
- Reduced fetal movements in last 24 hr
- Abnormality on auscultation (abnormal baseline, decelerations)

**How**

- Start intermittent auscultation as soon as established labour has been diagnosed
- Perform abdominal palpation to ascertain optimal position for auscultation of fetal heart
- Auscultate fetal heart using Doppler ultrasound or Pinard stethoscope whilst palpating maternal pulse to differentiate between maternal and fetal heart rates (FHR)
- Listen for 1 full minute after a contraction and record average rate
  - in first stage – at least every 15 min
  - in second stage – at least every 5 min
- Document maternal and fetal heart rates in maternal healthcare record
- Note any intrapartum events that may affect the FHR contemporaneously in maternal healthcare record, sign and note time
- If any concern about decelerations, palpate maternal pulse to differentiate the 2 heart beats

### Electronic fetal monitoring

- Transfer to EFM if:
  - abnormal FHR:  $\leq 100$  bpm or  $\geq 160$  bpm or any decelerations after a contraction
  - intermittent auscultation is not possible
  - significant meconium stained liquor
    - see **Meconium stained liquor** guideline
  - suspected chorioamnionitis or sepsis, or maternal pyrexia  $\geq 38.0^{\circ}\text{C}$
  - fresh bleeding developing in labour
  - severe hypertension  $> 160/110$  mmHg
  - oxytocin use for augmentation
  - epidural analgesia
  - woman's request
- Perform a full risk assessment and commence EFM if any of the following risk factors are present with another risk factor
  - $> 24$  hr since membrane rupture
  - confirmed delay in first or second stage of labour (see **Delay in labour** guideline)
  - non-significant meconium
  - pain different to contraction pain
  - moderate hypertension (single reading  $150/100$ – $159/109$  mmHg)
  - either, raised diastolic blood pressure of  $> 90$  mm/Hg or raised systolic blood pressure of  $> 140$  mmHg on 2 consecutive readings 30 min apart
  - 2+ protein on urinalysis and single reading of either diastolic blood pressure ( $> 90$  mmHg) or raised systolic blood pressure ( $> 140$  mmHg)
  - maternal pulse  $> 120$  bpm on 2 occasions 30 min apart
  - 2 consecutive readings of temperature  $> 37.5^{\circ}\text{C}$  1 hr apart

**DEFINITION**

<b>Latent phase</b>	● Period of time, not necessarily continuous, where there are painful contractions and some cervical change $\leq 4$ cm dilatation – see <b>Latent phase of labour</b> guideline
<b>First stage</b>	● Regular painful uterine contractions and progressive cervical dilatation $>4$ cm
<b>Second stage</b>	<b>Passive</b> ● Full dilatation of cervix before or in the absence of expulsive contractions <b>Active</b> ● Expulsive contractions with full dilatation of cervical os ● Presenting part of baby visible or active maternal effort in the absence of expulsive contractions
<b>Third stage</b>	● Time of birth of baby to expulsion of placenta and membranes – see <b>Third stage of labour</b> guideline

**ADVICE TO WOMAN AT ONSET OF LABOUR**

- Advise woman to telephone nearest labour ward for advice
- **If homebirth** planned, community midwife will attend
- **If inpatient birth** planned, advise woman to attend the unit for assessment if:
  - contraction pattern suggesting established labour
  - history suggestive of rupture of membranes
  - woman was advised during antenatal period to present early in labour

**INITIAL ASSESSMENT OF LABOUR**

- In all clinical settings and in all women, midwife must perform an initial assessment
- Review clinical records, ideally before admission, including any safeguarding concerns and anaesthetic and neonatal alerts
- Take history
- Assess emotional and physical needs
- Review of birth plan

**Maternal and fetal observations**

- Perform the following observations:
  - maternal pulse
  - blood pressure
  - temperature
  - respiratory rate
  - urinalysis

**Examination**

- Abdominal palpation
  - fundal height in centimetres
  - lie
  - presentation and position
  - engagement
- Vaginal loss:
  - liquor colour (e.g. clear or meconium)
  - show
  - blood loss and amount

**Vaginal assessment**

- If in established labour, offer vaginal assessment
  - explain reason and what is involved
  - obtain verbal consent

### **Fetal wellbeing**

- Auscultate fetal heart rate (FHR) for a minimum of 1 full minute immediately after a contraction
- Ask about fetal movements in last 24 hr
- Palpate maternal pulse rate to differentiate between maternal and FHR
- If there is a clinical indication, perform electronic fetal monitoring (EFM) – see **Electronic fetal monitoring** guideline

### **Blood and blood products**

- If not already done, ask woman if she is prepared to accept blood or blood products – see **Refusing blood and blood products** guideline

### **Thromboembolism**

- Carry out VTE risk assessment using local protocol

### **Communication and documentation**

- Document findings of assessments
- Discuss findings, birth plan and analgesia with woman/and her partner

### **CLINICAL RISK ASSESSMENT**

- Must be performed in all women by a midwife in all clinical settings, whether in maternity unit or at home
- Once labour diagnosed, complete intrapartum risk assessment and devise individualised management plan
- If an obstetrician is involved in woman's care, he/she should repeat risk assessment

### **Full risk assessment**

- Determine level of risk based on:
  - medical comorbidity
  - anaesthetic history
  - previous obstetric history
  - lifestyle history
  - any concerns with this pregnancy e.g. IUGR

- examination
- observations
- current complaint

### **Identified risks**

- To minimise risk to mother and baby, instigate a management plan for each risk identified
- If risk is such that midwifery-led care is no longer appropriate, discuss with middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) and transfer care to obstetric team
- Advice for management can also be obtained from resident anaesthetist

***Assess risk status continuously and change management plan accordingly***

### **Documentation and handover**

- Document risk assessment clearly in maternal healthcare record
- Ensure thorough face-to-face verbal handover between midwives and document (including identified risks) using appropriate structured handover tool
- Repeat risk assessment at handover of care from each midwifery shift and document any supplementary risks identified

### **FIRST STAGE OF LABOUR**

#### **Observations and assessment during first stage**

- As a minimum, perform and document the following on partogram at frequencies indicated, unless other clinical reasons to document more frequently:
  - temperature: 4-hrly
  - blood pressure: 4-hrly
  - maternal pulse: hourly
  - abdominal palpation followed by vaginal assessment: 4-hrly
  - frequency of contractions: every 30 min
  - frequency of bladder emptying (test and measure amount voided) – see **Bladder care** guideline

# LABOUR MANAGEMENT (including clinical risk assessment) • 3/4

- If not EFM, auscultate fetal heart rate for  $\geq 1$  full minute every 15 min following a contraction
- If FHR abnormality suspected, palpate maternal pulse to differentiate – see **Electronic fetal monitoring** guideline
- Once in established labour, complete partogram
- VE: 4-hrly

**Carry out continuous risk assessment to determine whether to transfer to high-risk labour care**

## Woman's comfort

- Midwife must provide:
  - 1:1 care when labour is established when possible
  - regular assessment of woman's emotional and physical state
  - support and ensure that the woman is fully informed at all stages
  - ongoing discussion regarding pain relief
- Encourage the woman to have support from her birth partner(s) of her choice

## Diet and fluids

- Throughout first stage of established labour offer a light, easily digestible diet and encourage fluid intake
- If clinical evidence of dehydration, give IV fluids, either 1 L sodium chloride 0.9% or compound sodium lactate (Hartmann's) solution IV (according to local practice)
- **High-risk women – no diet**, clear fluids (including isotonic drinks) only

## H<sub>2</sub> receptor antagonists (antacids)

- **Low-risk women** – not routinely offered (unless opioid analgesia used in labour)
- **High-risk women** – offer ranitidine 150 mg oral 6-hrly (if oral inappropriate, 50 mg IM 6-hrly)

## Position and mobility

- An upright position during labour facilitates efficient uterine contractions, shortens latent phase and reduces need for analgesia
- Encourage mobilisation
- Allow woman to adopt a position she is comfortable with

## Delay in first stage of labour

- See **Delay in labour** guideline

## SECOND STAGE OF LABOUR

**Risk to mother and fetus increases during second stage of labour**

## Presumptive diagnosis of second stage

- Overwhelming urge to push
- Presenting part becomes visible
- Woman wants to empty bowels and has heavy mucoid show

## Definitive diagnosis

- Full dilatation of cervix on vaginal examination

## Maternal observations

- Monitor and record on partogram:
  - temperature: 4-hrly (unless clinical indications for more frequently)
  - blood pressure: hourly (unless other indications e.g. medical reasons, epidural *in situ*)
  - pulse rate – every 15 min to differentiate between the 2 heart rates
  - vaginal assessment hourly in active second stage (after abdominal assessment and assessment of vaginal loss)
  - frequency and length of contractions: 30 min intervals
- Encourage woman to void bladder and test each void for ketones and protein
- Document fluids given

**Fetal observations**

*Carry out continuous risk assessment to see if transfer to high-risk labour care necessary*

- Unless continuous fetal monitoring, intermittent auscultation of FHR after each contraction for  $\geq 1$  full minute every 5 min
- If fetal bradycardia suspected, palpate maternal pulse rate
- Record FHR on partogram (even if using continuous monitoring)
- Note colour of any liquor draining
- Palpate fetal position and abdominal descent of fetal pole
- Document all findings

**Care and positioning during second stage**

- Provide emotional and psychological support
- Respect woman's choice of position but discourage from lying supine or semi-supine

**Delay in second stage/fetal distress**

- If delay in second stage suspected, see **Delay in labour** guideline

**Preparation for delivery**

- Prepare environment and equipment

**THIRD STAGE LABOUR**

- See **Third stage of labour** guideline

### INTRODUCTION

- Latent phase of labour is a normal process during which dynamic physiological and emotional changes (unique to each woman) occur. It is vital that healthcare professionals caring for women in the latent phase of labour appreciate this physical and psychological process
- This guideline is applicable to women expecting a vaginal birth 37–42 weeks' gestation

### DEFINITION

- Onset of short, mild, irregular contractions that soften, efface and begin to dilate the cervix from 0–4 cm. Average duration is poorly understood

### ANTENATAL ADVICE

- Midwife will discuss process of latent phase of labour with woman in antenatal period <37 weeks' gestation, providing her with a realistic understanding of what to expect
- Include this topic in parent education classes and, if available locally, provide woman with an information leaflet
- Provide woman and her birth partner(s) with information about the type of support available during the latent phase of labour
- When developing birth plan, discuss coping strategies, as anxiety can impact on the effectiveness of other relaxation techniques

### MANAGEMENT

#### Telephone assessment

- Most women who feel they are in labour make their first contact with midwife by telephone, in order to seek help and advice. This first contact is an important initial assessment, and it is preferable for a midwife to speak directly with the woman

- if contact is from woman's support person, advise him/her that it would be more appropriate for midwife to speak to the woman directly
- In order that advice and reassurance can be based on individual need, obtain a detailed history
- Document discussions, information and advice given
- retain a record for future reference if woman makes contact again regarding her labour
- Midwife must exercise professional judgement when diagnosing latent phase of labour

### Action

- If appropriate, encourage woman to stay at home and continue normal daily activities, light diet and plenty of fluids, ideally with company, but to make further contact if her needs change or she requires midwife support
- Advise about pain relief strategies (see below)
- On the third telephone assessment made by a midwife, arrange for woman to attend maternity unit for full maternal and fetal assessment and plan of care

**After 3 telephone assessments, midwife must see woman**

### Assessment on admission

- See **Labour management** guideline
- Midwife should undertake a full assessment, taking into consideration the woman's reactions to the physiological and emotional changes

### Vaginal examination

- Following discussion with woman, consider need for vaginal examination
- if, after examination, it is decided woman is not in active labour, encourage her to go home with advice about when and who to contact

### Prolonged latency

- If woman readmitted for a third time, and still not in established labour, consider electronic fetal monitoring and repeat assessment
- discuss with obstetrician/delivery suite co-ordinator
- Advise woman to inform midwife if:
  - intensity and frequency of contractions increases
  - any change in fetal activity
  - vaginal loss
  - any other concerns, whether at home or within maternity unit
- If woman unable or reluctant to go home for whatever reason, or requires pain relief and support, care for her in a non-intrusive environment with access to food and drink
- Women remaining in hospital but not deemed to be in established labour require fetal and maternal assessment, depending on risk assessment
- Women in the latent phase of labour should eat and drink as their appetite dictates. Fasting can lead to dehydration and ketosis, resulting in the need for intervention

### Pain relief in latent phase

- Relaxation techniques including breathing methods, massage, hydrotherapy, and effective support from birth partner(s)
- Birthing ball
- TENS machine
- Hydrotherapy – consider upright positions using a shower as a more effective alternative to soaking in the bath. However if woman becomes tired, soaking in a bath may provide some relief
- Do not offer or advise aromatherapy, yoga or acupuncture for pain relief during the latent first stage of labour
- if a woman wants to use any of these techniques, respect her wishes
- Paracetamol can be given 1 g every 4–6 hr, up to 4 g in 24 hr
- Consider giving pethidine or morphine prescribed by a medical practitioner
- Women who have been given pethidine during the latent phase should not go home for  $\geq 6$ –8 hr after administration, and have CTG before discharge home

***Induction of labour may be considered for those women having a long latent phase. Decision must be taken based on individual risk factors following discussion with the woman and obstetrician***

### DEFINITIONS

#### Definition of nationally reportable maternal deaths

Death while pregnant or within 1 yr of end of pregnancy, childbirth or abortion from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes

#### *Direct*

Resulting from obstetric complications of the pregnant state (pregnancy, labour, and puerperium) from interventions, omissions, incorrect treatment or chain of events resulting from any of the above

#### *Indirect*

Resulting from previous existing disease or disease that develops during pregnancy not due to direct obstetric causes, but aggravated by the physiological effects of pregnancy

#### *Late death*

Occurring between 42 days and 1 yr after abortion, miscarriage or delivery owing to direct or indirect maternal causes

#### *Coincidental death*

Occurring from unrelated causes that occur in the pregnancy or puerperium, e.g. road traffic collision

#### Legal requirements

It is a statutory requirement that healthcare professionals provide information and participate in confidential enquiries. Head of midwifery must ensure other areas of the Trust e.g. A&E, ICU are aware of this requirement

#### Support for staff

Maternal death is a distressing event for all staff involved. Support should be provided as per local protocols

### DIRECT MATERNAL DEATH WHILE UNDER MATERNITY CARE

#### Immediate action

#### *Senior midwife in charge of shift*

- Allocate a member of staff to act as support
- Inform:
  - head of midwifery
  - on-call midwifery manager
  - bereavement officer (where available) as soon as possible within working hours
  - on-call consultant
  - mortuary

#### *On-call consultant*

- Will meet and support relatives
- If cause of death **known**, request permission for post mortem
- If cause of death **unknown**, inform Coroner who will order a post mortem, if he/she feels necessary
- Issue death certificate
- Inform woman's consultant as soon as possible after the death and transfer responsibility for the case if appropriate
- Ensure relatives meet with named obstetric consultant

#### *Midwife in charge of the case*

- Offer support to family
- Document events and secure in maternal healthcare record
- Forward photocopy of documents to head of midwifery and/as per local protocol (original documents may have to go to Coroner)
- Participate in review of records
- Inform GP
- Inform named community midwife
- Inform health visitor
- If death occurs outside own area boundaries, notify senior midwife in area woman is booked
- Complete local Trust checklist
- Complete adverse incident form

### **Member of staff supporting relatives**

- Provide 'What should I do now?' booklet (if available locally)
- Liaise with hospital bereavement officer to arrange religious/spiritual support and completion and issuing of death certificate
- Ensure adequate provision made for baby: consider social services for help and advice particularly if parents not married

### **Bereavement officer (where available)**

- Will be the point of contact for family and medical and midwifery staff
- Offer expert advice and support

### **Head of midwifery and risk manager**

- Act as co-ordinator
- Maintain confidential and accurate record of each stage of procedure
- Retain information to feed into current national process
- Work closely with professional midwifery advocate (PMA)
- Provide report detailing events and cause of death to departmental clinical managers, divisional clinical governance manager and Trust chief executive
- Ensure that the duty of candour is fulfilled
- Ensure that it is reported as Strategic Executive Information System (STEIS) incident
- Ensure that details are reported to MBRRACE UK (Mothers and Babies Reducing Risk through Audits and Confidential Enquiries across the UK) <https://www.mbrrace.ox.ac.uk/>

### **PMA**

- Will notify local supervising authority (LSA) officer using appropriate form

- Review maternal healthcare record with midwife in charge of case and complete a summary. Note names of all staff involved, particularly those who do not normally work within the maternity department e.g. resuscitation team, operating department practitioners

***Through the risk management process, identify and arrange support for all staff concerned***

### **MATERNAL DEATH (NOT IN MATERNITY UNIT)**

- In the event of a maternal death in hospital but not in the maternity unit, department concerned must notify head of midwifery as soon as possible within normal working hours
- A designated PMA will inform LSA officer
- It is the responsibility of the department in which the maternal death occurred to inform Coroner's office (where necessary) and to ensure multidisciplinary decision-making in the management of maternal death and level of investigation required (e.g. post mortem) is documented
- In the case of a death occurring within A&E this is an automatic requirement

### **DEATH IN PRIMARY CARE**

#### **Indirect, coincidental and late**

- Deaths in primary care setting may include, murder, suicide, road traffic collision, women with known terminal illness and should be dealt with on an individual basis
- Woman's midwife is responsible for ensuring supervisor of midwives is informed of any maternal death in the primary care setting that comes to her attention
- Supervisor of midwives will inform head of midwifery and LSA
- GP should notify the hospital where woman had delivered or received care
- If maternal death occurs in the community, GP must notify director of Public Health

# MATERNAL TRANSFER (INCLUDING IN-UTERO TRANSFER) • 1/4

## BACKGROUND

- Safe transfer or retrieval of a woman from one clinical care setting to another to provide care in specialist area or centre
- Transfers may be made for maternal or neonatal reasons and can occur at any stage of antenatal, intrapartum or postnatal period
- It may be necessary to transfer between community and hospital or from one hospital to another (e.g. where specific maternal/neonatal facilities are required)

## This guideline covers

- Transfer into hospital from community
- Transfer to another specialist unit within Trust
- Transfer to maternity unit from within Trust
- Transfer to another Trust
- In-utero transfer
- Postnatal transfer

## PREPARATION FOR ALL TRANSFERS

- Before transfer, perform risk assessment and complete local handover tool (e.g. ACCEPT, SBAR)
- Inform clinical staff and woman of reason for transfer
- Document events leading up to decision to transfer, together with a provisional diagnosis
- Before transfer complete local handover tool including:
  - summary of woman's condition
  - provisional diagnosis
- Woman and baby's medical record must accompany them when they transfer
- There should be local agreements with the ambulance service regarding attendance at emergencies or when transfer required
- Urgency of transfer will determine personnel required and mode of transport

## Equipment

- Ensure accompanying equipment functioning with charged batteries
- Supply sufficient drugs and fluids for entire journey
- Secure lines (e.g. IV, CVP, urinary catheter)

## Woman

- Explain reason for transfer to woman and partner and document discussion in healthcare record
- Obtain and record consent (where able)
- Stabilise woman for transfer

## Documentation (requirements for each staff group)

### Midwife

- Documentation and handover responsibility, to include:
  - summary of maternal transfer documented in woman's healthcare record and continue to complete appropriate tool for handover as per local policy
  - ensure full photocopy of maternal healthcare record (including electronic fetal monitoring (EFM) traces, drug charts, investigation results etc.) accompany woman. If results not available at time of transfer, telephone as soon as available

### Medical staff

- If transferring to another hospital, middle grade obstetrician (ST3-7 or equivalent e.g. staff grade, clinical fellow) to complete appropriate handover tool as per local policy, including:
  - drugs prescribed and administered
  - investigation reports/results
  - description of fetal heart rate (FHR) trace
  - anaesthetic chart (if applicable)

# MATERNAL TRANSFER (INCLUDING IN-UTERO TRANSFER) • 2/4

## Prepare for transportation

### Personnel

- Midwife must accompany woman
- Specialist personnel (e.g. anaesthetist, obstetrician) may be required to accompany woman, depending on her condition and current condition of the fetus after assessment by person(s) making decision to transfer

## Monitoring during transportation

- Continue appropriate monitoring during ambulance transfer until handover at receiving unit

## TRANSFER IN FROM COMMUNITY/FREESTANDING MATERNITY UNIT (FMU)

- Midwife caring for woman will:
  - identify need for transfer
  - inform team leader of appropriate clinical area (depending on condition necessitating transfer)
  - outline patient history and current maternal and fetal/baby condition using local risk assessment tool

## Requesting emergency ambulance transfer

- Midwife caring for woman will call 999 and request ambulance with paramedic assistance
- Follow local home birth and transfer from FMU guidelines

## On admission to delivery suite

### If admitted to delivery suite (e.g. from home birth)

- Woman to be seen and reviewed by middle grade (ST3–7 or equivalent e.g. staff grade/clinical fellow) or consultant obstetrician
- aim for within  $\leq 30$  min of arrival onto delivery suite

- Wherever appropriate and possible, community midwife responsible for transfer should continue to care for woman

## TRANSFER TO OTHER SPECIALIST UNIT WITHIN TRUST

- Booking transport:
  - midwife will arrange transport (e.g. ambulance or porter) as per local practice
- Daily review by middle grade (ST3–7 or equivalent e.g. staff grade/clinical fellow) or consultant obstetrician
- delivery suite team leader to make daily contact with the specialist unit to ensure antenatal/postnatal care maintained as required
- document subsequent treatment/discussions in woman's healthcare record

*Decision to transfer woman to other specialist unit within Trust (e.g. critical care area) must be made by consultant obstetrician and consultant anaesthetist after discussion with senior staff in receiving area (e.g. intensive care consultant)*

## TRANSFER TO MATERNITY UNIT FROM WITHIN TRUST

*Multidisciplinary decision involving transferring team, receiving team, consultant obstetrician and midwife*

- Delivery suite team leader will inform all appropriate members of maternity team of impending arrival
- Transferring department to ensure robust handover provided using appropriate tool as per local policy, to include:
  - reason for:
    - admission
    - referral
  - history
  - healthcare record (accompanies woman)
  - drugs prescribed/administered
  - investigation requests/results

## TRANSFER FROM DELIVERY SUITE TO ANOTHER TRUST

- On-call consultant obstetrician will make decision to transfer woman
- Once decision confirmed, delivery suite team leader and middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) will co-ordinate arrangements and allocate tasks to team members
- If anaesthetic referral required, consultant anaesthetist will contact consultant anaesthetist at receiving unit directly

## Requesting ambulance transfer

- Person making decision will indicate transportation required. Consultation with neonatologist and anaesthetist may be necessary
- Transfer co-ordinator will allocate the task of booking ambulance (as per local agreement with ambulance service) to a team member, who will:
  - book ambulance, indicating urgency
  - request specific equipment (e.g. stretcher, oxygen, portable ventilator)
  - indicate number of personnel accompanying woman (dependent upon multidisciplinary team assessment)
  - request estimated time of arrival

## Arrival at receiving unit

- Escorting staff should:
  - complete appropriate handover tool as per local policy
  - ensure copy of relevant medical/ maternity notes/records
  - document details of transfer process in maternal healthcare record until transfer of care completed

## IN-UTERO TRANSFER

- In-utero transfer is a major disruption for women and their families and often carries significant risks. It is essential that the woman and her family are involved in the decision-making process and have given their consent to proceed
- If woman is being transferred antenatally due to lack of neonatal facilities, delivery suite team leader or consultant obstetrician to locate unit able to accept both mother and neonate
  - agreements with local units may be in place
- Regional Cot Locator can assist in finding appropriate unit. Telephone: 0300 200 1100
- Consultant obstetrician makes decision for in-utero transfer after individualised risk assessment based on current clinical situation

## Indications for in-utero transfer out

- Suspected or actual preterm labour <34 weeks' gestation when no appropriate level neonatal cots available in unit
- Women <34 weeks' gestation requiring delivery for fetal or maternal reasons when no NICU cot available
- Unit unable to safely facilitate management of high-risk cases due to delivery suite activity – see local maternity escalation and closure policies
- Specialist neonatal care not available at local unit e.g. elective early postnatal surgery indicated for neonate

### Indications not to transfer out

- Where transfer may pose a significant risk to mother or baby, continue management locally and instigate ex-utero transfer as necessary e.g.:
  - advanced labour
  - non-reassuring features on CTG
  - unstable mother
  - obstetric complications e.g. antepartum haemorrhage
- This list is not exhaustive – discussion with neonatal and obstetric teams for agreed plan

### Procedure

- Ensure ongoing consideration of maternal and fetal condition throughout the transfer process, looking for any deterioration in maternal/fetal wellbeing. Follow your local Trust in-utero transfer guideline
- It is good practice to ensure woman receives appropriate follow-up

### POSTNATAL TRANSFER

- If transferring woman alone postnatally, midwife will discharge baby to the care of woman's partner/relatives
- If unable to discharge baby to family, arrange care as per local policy (e.g. as lodger on special care baby unit)

### BACKGROUND

- Meconium stained liquor occurs in 10–20% of deliveries, increasing to over 30% after 42 weeks' gestation
- Meconium aspiration syndrome occurs in 2–5% of babies born through meconium stained liquor
- Significant meconium at onset of labour carries the worst prognosis and is associated with five to seven-fold increased risk of perinatal death

### DEFINITION

#### Significant

- Dark green or black amniotic fluid that is thick or tenacious or any meconium stained amniotic fluid containing lumps of meconium

#### Light

- Staining of lesser severity

### MANAGEMENT

- Unless birth imminent, transfer from low-risk setting to care of an obstetrician as per local protocol
- If woman is not in labour and thick meconium is present, arrange induction of labour
- Continuous electronic fetal monitoring (EFM) is advised for women with significant meconium stained liquor – see **Electronic fetal monitoring (EFM) - Labour** guideline

#### In labour

- Whatever the degree or time of passage of meconium, fetal risks are increased
- Document the presence or absence of significant meconium
- If fetal heart rate abnormalities also present, perform fetal blood sampling – see **Fetal blood sampling** guideline
- When delivery imminent, call neonatal team according to local practice

- Take umbilical cord sample – see **Umbilical cord sampling** guideline
- Report meconium change from light to significant to middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)

### RESUSCITATION OF BABIES BORN FROM MECONIUM STAINED LIQUOR

*Ensure resuscitation equipment is checked and ready for use before delivery*

#### In the presence of any degree of meconium:

- **Do not** suction baby's upper airways:
  - before birth of shoulders and trunk
  - if baby has normal respiration, heart rate and tone
- **Do not** intubate if baby has normal respiration, heart rate and tone
- Tracheal intubation should not be routine in presence of meconium, and should only be performed for suspected tracheal obstruction
- Emphasis should be on initiating lung inflation within first minute of life in non-breathing or ineffectively breathing infants, and this should not be delayed
- If baby does not have normal respiration, heart rate and tone, follow nationally accredited guidelines on neonatal resuscitation, including early laryngoscopy and suction under direct vision
- Obtain arterial and venous cord blood to assess pH and blood gases – see **Umbilical cord sampling** guideline. Record values in maternal healthcare record and, if local practice, in neonatal notes
- In the presence of significant meconium, or light with other fetal risk factors:
  - ensure that neonatologist/advanced nurse practitioner is available at birth
  - if baby is floppy and apnoeic and born through thick particulate meconium it is reasonable to inspect oropharynx rapidly to remove potential obstructions

### Active baby

- If baby crying and active at birth:
- dry and cover to avoid hypothermia
- **do not** aspirate airways
- neonatologist **does not** inspect larynx or aspirate trachea (unnecessary intubation and lower airway suction does more harm than good)

### Floppy baby

- If baby floppy, pale and makes no immediate respiratory effort at birth, call neonatal team (if not already present) and commence neonatal resuscitation – see **Cardiopulmonary resuscitation of the newborn** guideline (**Airway**) or follow local guidance

### Postnatal observations

- For any baby delivered with a history of significant meconium, perform the following observations at aged 1 and 2 hr and then 2-hrly until aged 12 hr or as per local policy. Document in neonatal observations chart:
  - general wellbeing
  - chest movement and nasal flare
  - skin colour including perfusion by capillary refill
  - feeding
  - muscle tone
  - temperature
  - heart rate and respiration
- If light meconium staining occurred, observations for baby as above at aged 1 and 2 hr and document in neonatal observations chart
- If baby's condition causes concern at any time, review by neonatologist

# MEDICAL TERMINATION OF PREGNANCY FOR FETAL ABNORMALITY AND FETOCIDE • 1/2

## PROCEDURE

- Obtain written informed consent, together with written agreement of 2 certified medical practitioners who have signed HSA1 form (Abortion Act 1967 revised 1991)
- Guidance from Royal College of Obstetricians and Gynaecologists on termination of pregnancy for fetal abnormality stresses that a legal abortion 'must not be allowed to result in a live birth'. Therefore, method of termination of pregnancy >21 weeks, should ensure fetus is born dead
- Where termination is planned >21<sup>+6</sup> weeks for abnormalities that are not lethal, consultant in fetal medicine must discuss fetocide with woman
- If woman refuses fetocide, document clearly in maternal health care records that it has been offered and declined
- Inform women that even before cut off of 21<sup>+6</sup> weeks there is a chance the baby may show signs of life
- this does not mean the baby will survive
- the baby then needs to be registered as a neonatal death

## RECOMMENDED DRUG REGIMEN

### Initial drug dose

- Mifepristone (Mifegyne® RU 486) 200 mg oral is administered by middle grade obstetrician (ST3-7 or equivalent e.g. staff grade, clinical fellow) or consultant on licensed premises and a healthcare professional must observe woman take tablet
- Inform woman of possibility of abdominal discomfort and/or a small amount of bleeding
- reassure that this is normal and can be treated with regular paracetamol at home
- Ask woman to remain on premises for 1 hr to observe side effects
- if vomiting occurs, repeat dose

- Provide contact telephone numbers with instructions to call if she has any concerns while at home. Give patient information leaflet, if available locally

### Further drug regimen

- No more than 24–72 hr after initial dose of mifepristone 200 mg oral, give misoprostol:
  - <27 weeks' gestation: 100 microgram vaginally 6-hrly – **maximum 4 doses**
  - ≥27 weeks' gestation: 25–50 microgram vaginally 4-hrly – **maximum 6 doses**

*In previous caesarean section (CS) or uterine surgery, where the cavity has been breached (e.g. myomectomy, uterine perforation) use 25–50 microgram dosage*

### Side effects/complications associated with misoprostol

- Pyrexia
- Diarrhoea
- Retained placenta
- Hypovolaemic shock
- Ruptured uterus
- Extra vigilance in women with:
  - severe asthma
  - previous operative delivery
  - cardiovascular insufficiency
  - previous CS
  - anticoagulant treatment
  - renal/hepatic failure
  - long-term corticosteroid therapy
- Advise woman she may experience flu-like symptoms e.g. feeling feverish or rise in temperature

# MEDICAL TERMINATION OF PREGNANCY FOR FETAL ABNORMALITY AND FETOCIDE • 2/2

## INTRAPARTUM MANAGEMENT

- See **Perinatal bereavement** guideline

### Management of third stage

- Actively manage according to **Third stage of labour** guideline
- In general, woman should be cared for as if she had experienced any other fetal loss (see **Perinatal bereavement** guideline)
- Give anti-D and send Kleihauer for Rhesus-negative women
  - 250 IU <20 weeks' gestation
  - 500 IU ≥20 weeks' gestation

### Notifying Department of Health

- Doctor responsible for commencing termination of pregnancy is required, by law, to notify Department of Health by submitting relevant (yellow HSA4) form

## FETOCIDE

*If not performed locally, refer to regional centre*

### Definition

- Intracardiac injection of potassium chloride to induce fetal death before termination of pregnancy

### Informed consent

- Counsel woman about reasons for carrying out fetocide and explain legal position and ethical implications should baby be born alive

### Pre-termination assessment

- Carried out by trained staff who will provide counselling and support
- Obtain informed consent
- Perform ultrasound scan immediately before procedure to confirm presence of fetal abnormalities and select suitable site for needle entry

- For fetus with chromosomal abnormality, scan features may not be present. Laboratory report must be available to consultant before fetocide performed

### Procedure

- Obtain potassium chloride solution from pharmacy in accordance with Trust policy
- Midwife to provide emotional and psychological support
- Identify suitable entry site and clean abdomen and probe with antiseptic solution
- Anaesthetise skin and subcutaneous tissues with lidocaine 1% 5–10 mL
- Draw 1.5 g (10 mL potassium chloride 15% KCl) into a new syringe
- Place sterile aqueous gel onto probe to facilitate scanning
- Under ultrasound guidance, insert 21 gauge echo tip needle into fetal heart
- Using a 5 mL syringe, withdraw a small volume of fetal blood to confirm correct placement of needle. If required, send blood for cytogenetic analysis
- Slowly inject 5–8 mL KCl solution into fetal heart until cardiac activity stops
- Allow mother to rest for several minutes before performing a confirmatory scan to check fetal cardiac activity has not resumed
- Administer anti-D to Rhesus-negative women
- Transfer mother to delivery suite to complete termination

*Be aware of the nature of your local perinatal mental health service provision*

### INTRODUCTION

- When managing women with mental health problems in pregnancy, there are 3 groups to consider:
- at increased risk of antenatal and postnatal depression
- mental health concerns in current pregnancy
- pre-existing severe and enduring mental health issues

### GENERAL PRINCIPLES

- Provide non-judgemental compassionate care
- Discuss role of partner, family and carers, and involve if acceptable to woman
- consider their needs
- may require explanation and education about mental illness
- Explore and check regularly woman's ideas, concerns and expectations
- Be sensitive to the issue of stigma and shame in relation to mental illness
- Acknowledge the role of the woman in caring for her baby
- Provide culturally relevant information on mental health problems in pregnancy and postnatal period to the woman, and if she agrees, to family and carers
- Ensure the woman understands mental health problems are not uncommon and instil hope about treatment
- Ensure interpreting services are available to women for whom English is not their first language/who have sensory impairment e.g. deaf/deafened/deaf-blind

### RED FLAGS AND ACUTE CONCERNS

#### Red flags

- Significant recent or rapidly changing alterations in mental state
- Emergence of new symptoms; can include psychotic symptoms (delusions, hallucinations) or severe anxiety in relation to her baby's (and/or other children's) welfare
- Psychotic symptoms that involve the baby
- Thoughts of violent self-harm or suicide
- New/persistent/non-reassurable ideas and expressions of these ideas
- woman believes she is incompetent/inadequate as a mother
- feels estranged from her baby
- Pervasive feelings of guilt and hopelessness
- Deterioration in function as a consequence of symptoms e.g. self-care, care of baby, avoidance of baby
- Not eating
- Severe insomnia
- Psychomotor retardation

#### Suicidal risk

- If you establish a woman feels hopeless and pessimistic about the future for herself, her family and/or baby, perform an urgent assessment of suicide risk
- ask her if:
  - she has thought about wanting to die, not wanting to wake up or wanting to end it all
  - the thoughts are present for long periods or are just fleeting
  - there is any accompanying image, whether they are violent or of seeing herself dead
- fully explore if she has any urges or impulses to harm herself/her baby
  - ask her if she has made any plans

- If she has violent thoughts, plans, images or impulses keep her and her baby/children safe – see **Acute concerns** below
- Times of high suicide risk:
  - conclusion safeguarding meetings
  - removal of baby

### Acute concerns

- If the woman is at risk of harming herself/others, ensure she is accompanied and kept in a safe environment
- In hospital: may be appropriate to call police and/or hospital security staff, particularly if:
  - large number of people to control
  - area needs to be cordoned off
- In community: call police, who will take woman to a place of safety and request police surgeon to assess mental health
- Under common law it is reasonable to use reasonable force to prevent a person harming themselves, e.g. trying to jump out of window
- Doctors can apply section 5(ii) of the Mental Health Act (1983) to detain woman for  $\leq 72$  hr
- If woman is suffering from mental illness/lacks capacity physical restraint can be used
  - must be proportionate to situation
  - large bean bag/pillow is ideal
- If the woman is risk to herself/others consider rapid sedation (e.g. haloperidol 10 mg IM)
  - contact obstetric anaesthetist for advice
  - if rapid sedation administered observe woman for several hours for respiratory depression, most appropriately achieved where enhanced maternity care is provided. Monitoring:
    - oxygen saturation
    - BP
    - ECG
    - RR
    - conscious level and airway assessment

### PREVENTION, DETECTION AND INITIAL MANAGEMENT

- Women at increased risk of postnatal mental illness are those who:
  - develop mental health problems during this pregnancy
  - have previous history of postnatal depression
  - with severe and enduring mental illness

### At booking

#### All women

- Ask about mental health problems using standard questions e.g. do you have a history of:
  - past/present mental illness?
  - previous treatment/inpatient care?
  - family history in first degree relative?
- Consider asking about anxiety using the 2-item Generalized Anxiety Disorder scale (GAD-2). Over the last 2 weeks, how often have you been bothered by:
  - feeling nervous, anxious or on edge?
  - not being able to stop or control worrying?
- Document responses in woman's healthcare record
- If history of previous mental health problems established see below

### History of severe postnatal depression/psychosis

- Midwife to obtain mental illness history/ relevant social information from GP record
- do not rely on the woman's history alone
- Women who have suffered puerperal psychosis have a 50% risk of recurrence
  - should be cared for by local perinatal mental health service **or**
  - booked under care of consultant obstetrician with an interest in mental health disorders **or**

- receive consultant-led care supported by an appropriate midwife or midwifery team
- If woman currently under care of community mental health team, refer to named care co-ordinator – otherwise, refer to relevant community mental health team to plan postnatal care
- At each postnatal contact ask women about their emotional wellbeing, support systems and coping strategies
- use above questions
- encourage women and their families to tell midwife about changes in mood/emotional state/behaviour
- Recognise that women with a mental health problem may be unwilling to disclose/discuss their problem because of:

### History of less severe postnatal depression

- Discuss with woman, partner and family:
  - recognition of symptoms of depression
  - need to contact GP early
- Encourage:
  - gentle exercise
  - resting when necessary
  - obtaining help with baby care
  - talking to someone about feelings and access to social support networks
- Consider enhanced schedule of visits in first 2 weeks
- 50% of women who become psychotic do so by day 7, and 75% by day 16
- fear of stigma
- negative perceptions of them as a mother
- fear that their baby might be taken into care
- Avoidance may be associated with mental health problem or related to drug/alcohol dependence
- If concern about woman's mental health, refer to GP/mental health service for further management

### Treatment

*Women at increased risk of suicide are characteristically white, older women who may be socially advantaged*

### Detecting current concerns

- Ask standard questions and document in antenatal hand-held records
- During the last month have you often been bothered by:
  - feeling down/depressed/hopeless?
  - having little interest/pleasure in doing things?
  - is this something you feel you need/want help with?
- Over the last 2 weeks how often have you been bothered by:
  - feeling nervous/anxious/on edge?
  - not being able to stop/control worrying?
- If answers positive, consider whether there are concerns about the woman's mental health
- Repeat above questions later in pregnancy

### Mild-moderate postnatal depression

- Self-help
- Refer to GP for:
  - listening visits at home by health visitor/GP
  - cognitive behavioural therapy
  - medication if necessary

### Severe/psychotic postnatal depression

- Care by specialist mental health services

### MENTAL HEALTH CONCERNS IN CURRENT PREGNANCY

#### When assessing a mental health problem consider:

- History of mental health problems
- Physical wellbeing
- Alcohol and drug misuse
- Woman's attitude towards pregnancy and baby
- Woman's past obstetric history
- Past and present treatment with response
- Social networks, social isolation and quality of interpersonal relationships
- Living conditions
- Family history of mental health problems
- Domestic abuse
- Child sex abuse/trauma/maltreatment
- Housing/employment/economic/immigration status
- Responsibilities as carer
- Learning difficulties/cognitive impairment

#### Postnatal depression can start during pregnancy – signs of significant depression include:

- Gains no benefit from rest
- Suicidal thoughts
- Compulsive rituals
- Impaired concentration

#### New concerns

- If woman is in the community, community midwife will request GP review
- if GP unable to help/difficult to access, may be possible to refer woman to hospital
- If relatively minor concerns refer to GP for advice

- If problem is simple social isolation consider referral to local children's centre to arrange visit by support worker
- Antenatal parent craft classes may be helpful
- Health visitor may commence visiting early, working with community midwife to ensure increased frequency of visits (particularly in first 2 weeks after delivery)
- If concerns are more acute – refer to local community mental health team
- If very acute concerns – contact community mental health team duty officer
- Women who develop significant mental health problems during pregnancy require a careful plan for labour and immediate post partum period, as for women with severe and enduring mental health problems – see below

#### Aged <18 yr

- Refer to child and adolescent mental health service (CAMHS) and inform health visitor at earliest opportunity
- If problem due to social isolation etc. discuss alternative services e.g. Connexions and the Youth Service

#### Starting medication

- Explain to the woman that there is a higher threshold for starting pharmacological treatment in pregnancy and postpartum due to:
  - different risk benefit ratio and likely benefits of psychological interventions
- When choosing medication take into account:
  - woman's previous response to these drugs
  - gestation
  - safety of these medicines in pregnancy – see **Common mental health drugs and pregnancy** below

**PRE-EXISTING SEVERE AND ENDURING MENTAL HEALTH PROBLEMS**

- Including women with diagnosis of:
  - schizophrenia
  - bipolar affective disorder/manic depression
  - severe depression (that required in-patient admission)
  - mental illness in association with either learning difficulties/profound socio-economic deprivation
- Pre-pregnancy counselling is the ideal to cover:
  - contraception
  - effect on mental health including risk of relapse
  - effect of mental health and treatment (see below) on woman, fetus and baby breastfeeding
  - how mental health problem/treatment might affect parenting
- Manage under consultant obstetrician-led care

**Communication with community mental health services**

- Send copy of hospital antenatal clinic booking letter to GP and woman's named care co-ordinator in community mental health team
- Community mental health team can seek obstetric advice from lead obstetrician for mental health/on-call obstetric consultant

**Use of drugs in pregnancy**

- Risks of medication to the fetus to be balanced against risks of stopping medication to the woman and her family

Table 1

Reasons to continue medication	Reasons to stop medication
<ul style="list-style-type: none"> <li>● Relapse of mental health:                             <ul style="list-style-type: none"> <li>● poor antenatal care</li> <li>● poor self-care</li> <li>● interpersonal difficulties</li> <li>● abuse</li> <li>● impulsive behaviour</li> <li>● suicide</li> <li>● cigarette, alcohol/drug abuse</li> </ul> </li> <li>● relapse can affect attachment and emotional, social and cognitive development of a child</li> <li>● increased risk of infanticide and non-accidental injury and neglect</li> <li>● breakdown in child care</li> <li>● significant personal, family and social consequences for the woman</li> <li>● Baby already exposed to drug in early pregnancy</li> </ul>	<ul style="list-style-type: none"> <li>● All mental health drugs cross placenta and neurodevelopment continues through pregnancy</li> <li>● Information about long-term child health after mental health drug use in pregnancy is lacking</li> <li>● See <b>Table 2</b></li> <li>● <b>Neonatal adaptation syndrome:</b> <ul style="list-style-type: none"> <li>● usually mild</li> <li>● begins ≤48 hr, lasts ≤72 hr</li> <li>● insomnia</li> <li>● agitation, tremors, shivering</li> <li>● altered tone</li> <li>● restlessness or irritability</li> <li>● poor feeding</li> <li>● vomiting or diarrhoea</li> <li>● poor temperature control</li> <li>● rarely: seizure, tachypnoea, respiratory distress, nasal congestion</li> </ul> </li> </ul>

- Use minimal effective dose of drug with best evidence base
- If possible avoid polytherapy
- If woman has mental health problems and been under sole care of GP, ask GP to review need to continue medication
- Direct communication between mental health services and obstetric services is essential for some women
- When talking to the woman about her medication, explain all women are at risk of having a baby with a congenital abnormality
- 2–4 in 100 in general population – describe risk simply: e.g. 1 in 100 rather than 1% and 1 in 4, not 25 in 100
- if possible give written information and use visual aids
- See **Common mental health drugs and pregnancy** below
- Complete neonatal alert if required
- Strongly advise anomaly scan if required
- If a woman has taken medication with known teratogenic risk in the first trimester:
  - confirm gestation
  - sensitively explain that stopping medication may not remove risk to baby
  - offer detailed ultrasound with fetal medicine consultant
  - explain risk to baby if she continues the medication, balancing against risk of discontinuing – see **Deciding whether to stop medication**
- Possibility of sudden onset of symptoms particularly in early puerperium
- Her reasons
- Possibility of:
  - restarting
  - switching to another medication
  - psychological intervention
- Increasing level of monitoring and support
- Ensure she knows risk to herself and the fetus/baby of stopping medication
- Risk of discontinuation symptoms in woman and baby with most tricyclic antidepressants, selective serotonin reuptake inhibitor (SSRI) and serotonin norepinephrine reuptake inhibitor (SNRI)

### When a woman with mental illness decides to stop medication discuss:

### Eating disorders

- Most women with eating disorders improve during pregnancy but may relapse/develop postnatal depressive symptoms
- Perform GTT at 26–28 weeks' gestation, due to increased risk of gestational diabetes

### Child protection

- If concerns about unborn child's wellbeing, follow routine safeguarding procedures
- Have a low threshold for referring women with schizophrenia for safeguarding of their unborn child
- Some women avoid maternity care because of concerns about removal of their child. Extra vigilance and support is required around time of case conferences and afterwards, especially if recommendation is for removal of the child

### Deciding whether to stop medication

- Severity of mental health problem
- Likely benefit treatment options
- Previous response to treatment
- Background risk of harm to woman, fetus and baby with no treatment
- Risk to mental health and parenting with no treatment
- What might happen if medication is stopped abruptly

### Missed appointments

- If woman with severe and enduring mental health problems misses appointment:
- make contact to ensure she is well
- if concerned about her mental health, contact named mental health care co-ordinator (identified on booking letter) by phone, to allow earlier follow-up by community mental health team

### Smoking

- Offer smoking cessation
- success rates equal to those for general population

### Physical symptoms

*Women with mental health problems can have serious physical illness. Do not assume that all symptoms are attributable to a mental health disorder*

### Childhood sex abuse

- See **Sensitive practice** below
- If woman discloses a history of sexual abuse, a careful birth plan is required
- When discussing labour, it is important to carefully explain:
  - what a vaginal examination is and why it is necessary
  - not all women will achieve normal vaginal delivery and operative delivery may be necessary
  - discuss various methods of analgesia

### Individual management plan for delivery and puerperium

- Devise clear individual management plan for pregnancy, labour and immediate postnatal period
- for most women this happens at birth planning antenatal appointment

- For complex cases, community mental health team will, after discussion with the woman and partner, forward mental health joint care plan
- If direct discussion between obstetric and community mental health teams required, to include:
  - non-routine action required on admission in labour and before discharge
  - crisis plan
  - early relapse signs
  - schedule of monitoring in community
  - roles of professional; who co-ordinates plan and agrees outcomes with woman
- Co-ordinator must ensure:
  - interventions occur promptly
  - effective information sharing
- Share specific plan for delivery with woman, her family, community midwife, mental health team (in particular named care co-ordinator) and hospital obstetric team
  - clearly display plan in woman's healthcare record
- Inform GP of planned postnatal mental health support
- Obstetric team to inform relevant community mental health team consultant secretary when woman delivers, to allow plan to be implemented

### Contraception

- Attempt to establish plan for postnatal contraception during pregnancy

### Breastfeeding and neonatal care

- Encourage women with a mental health problem to breastfeed, unless they are taking carbamazepine, clonazepam or lithium. Valproate is not recommended to treat a mental health problem in women of child bearing potential
- Support each woman in her choice of feeding method

- When assessing risks and benefits of antidepressants take into account:
  - limited data about the safety of these drugs
  - risk of switching from a previously effective medication
- When assessing risks and benefits of antipsychotic medication, take into account:
  - limited data on the safety of these medications
  - level of antipsychotic medication in breast milk depends on drug
  - extra caution may be required with premature, small or sick infant
- If necessary seek advice from pharmacist, infant feeding specialist midwife or local perinatal mental health service
- If the woman takes psychotropic medication while breastfeeding, monitor baby for adverse effects
- Discuss risk of maternal sedation with the woman
- advise women receiving mental health medication not to share bed with baby

### Postnatal care

- Community mental health team to arrange enhanced support in postnatal period
- At each postnatal contact, ask woman about her emotional wellbeing, support systems and coping strategies
- Encourage woman and family to inform midwife about changes in mood/emotional state/behaviour
- If concerns community midwife will contact named care co-ordinator

**COMMON MENTAL HEALTH DRUGS AND PREGNANCY**

Table 2 (contact pharmacy for information for drugs not included)

DRUG	RISKS	ACTIONS
<b>Antipsychotics</b>		
	<ul style="list-style-type: none"> <li>● Extrapyrimal symptoms in neonate (usually self-limiting), respiratory depression, feeding problems and tremor</li> <li>● Excessive weight gain</li> </ul>	<ul style="list-style-type: none"> <li>● Neonatal alert</li> <li>● Avoid depot preparations if possible</li> <li>● Do not routinely prescribe anticholinergic drugs</li> <li>● Avoid excessive weight gain</li> </ul>
Haloperidol	<ul style="list-style-type: none"> <li>● Limb reduction disorder (very rare)</li> </ul>	<ul style="list-style-type: none"> <li>● Mid-trimester anomaly scan</li> </ul>
<b>Atypical antipsychotics</b>		
	<ul style="list-style-type: none"> <li>● Folate deficiency</li> <li>● Gestational diabetes and excessive weight gain</li> </ul>	<ul style="list-style-type: none"> <li>● 5 mg folate daily until delivery for all</li> <li>● Mid-trimester detailed scan</li> <li>● GTT</li> <li>● Avoid excessive weight gain</li> </ul>
Clonazepam	<ul style="list-style-type: none"> <li>● Theoretical risk of agranulocytosis and myocarditis of neonate</li> </ul>	<ul style="list-style-type: none"> <li>● Avoid if possible. Usually used when other mental health drugs ineffective and it is unlikely that it can be stopped</li> <li>● Avoid breastfeeding</li> </ul>
<b>Lithium</b>		
	<ul style="list-style-type: none"> <li>● Fetal heart defects</li> <li>● Ebstein's anomaly</li> <li>● Neonatal toxicity; floppy baby syndrome and hypothyroidism</li> <li>● Lithium toxicity to mother</li> <li>● ?polyhydramnios</li> </ul>	<ul style="list-style-type: none"> <li>● Neonatal alert</li> <li>● 20/40 detailed scan ?cardiac scan</li> <li>● If can be stopped, gradually withdraw</li> <li>● Check lithium levels and maintain in lower end of therapeutic range:                             <ul style="list-style-type: none"> <li>● every 4 weeks</li> <li>● &gt;36 weeks: weekly</li> <li>● ≤24 hr of delivery</li> </ul> </li> <li>● Keep hydrated. Admit with hyperemesis</li> <li>● IV fluids in labour</li> <li>● Avoid breastfeeding</li> </ul>

**Table 2 (contact pharmacy for information for drugs not included) cont.**

<b>DRUG</b>	<b>RISKS</b>	<b>ACTIONS</b>
<b>Antidepressants</b>		
	<ul style="list-style-type: none"> <li>● Stopping may result in net increased total dose because of risk of relapse and use of higher dose when restarted</li> <li>● Neonatal withdrawal (usually mild and self-limiting)</li> </ul>	
Tricyclic antidepressants	<ul style="list-style-type: none"> <li>● Neonatal withdrawal</li> <li>● Very toxic to small children</li> <li>● More likely to cause death in overdose</li> <li>● Higher rate of side effects than SSRIs</li> </ul>	● Neonatal alert
<b>Selective serotonin reuptake inhibitors (SSRIs)</b>		
	● Neonatal persistent pulmonary hypertension if taken >20 weeks' gestation	● Neonatal alert if taken after mid-trimester
Clomipramine	● Avoid in first trimester if possible	● Mid-trimester anomaly scan
Fluoxetine	<ul style="list-style-type: none"> <li>● Avoid in first trimester if possible</li> <li>● Higher levels in breast milk</li> </ul>	
Paroxetine	● More significant neonatal withdrawal	● Mid-trimester anomaly scan
Venlafaxine	● Maternal hypertension in high dose	● Monthly BP checks
Citalopram (current SSRI of choice in pregnancy)	● Higher levels in breast milk	
Sertraline (current SSRI of choice for breastfeeding)	● Lower levels in breast milk	
<b>Monoamine-oxidase inhibitors</b>		
	● Hypertensive crises	Avoid if possible Neonatal alert
<b>St John's wort</b>		
	<ul style="list-style-type: none"> <li>● Neonatal colic, lethargy and difficult breastfeeding</li> <li>● Uterotonic activity</li> </ul>	Avoid if possible Neonatal alert

Table 2 (contact pharmacy for information for drugs not included) *cont.*

DRUG	RISKS	ACTIONS
<b>Benzodiazepines</b>		
	<ul style="list-style-type: none"> <li>● Facial clefts</li> <li>● Floppy baby syndrome in neonatal withdrawal</li> </ul>	<ul style="list-style-type: none"> <li>● Should only be used for short-term treatment of severe anxiety/agitation</li> <li>● Mid-trimester anomaly scan</li> <li>● Neonatal alert</li> </ul>
<b>Mood stabilisers</b>		
Carbamazepine	<ul style="list-style-type: none"> <li>● Neural tube defects</li> <li>● Gastrointestinal anomalies</li> <li>● Cardiac anomalies</li> </ul>	<ul style="list-style-type: none"> <li>● Avoid if possible</li> <li>● 5 mg folate daily throughout pregnancy</li> <li>● Mid-trimester anomaly scan</li> </ul>
Lamotrigine	<ul style="list-style-type: none"> <li>● Facial cleft</li> <li>● Stevens-Johnson syndrome (rare)</li> <li>● Serum concentration of lamotrigine in women taking concomitant sodium valproate is doubled</li> </ul>	<ul style="list-style-type: none"> <li>● Avoid if possible</li> <li>● Monitor levels in pregnancy and puerperium</li> <li>● Mid-trimester anomaly scan</li> <li>● Inform woman of risks and benefits of breastfeeding                             <ul style="list-style-type: none"> <li>● if breastfed, advise to take baby to emergency department if generalised rash develops</li> </ul> </li> </ul>
Sodium valproate	<ul style="list-style-type: none"> <li>● Neural tube defects</li> <li>● Craniofacial and cardiac abnormalities</li> <li>● Affects intellectual development</li> </ul>	<ul style="list-style-type: none"> <li>● Avoid if at all possible – if not use slow release</li> <li>● 5 mg folate daily throughout pregnancy</li> <li>● Mid-trimester anomaly scan</li> <li>● Neonatal alert</li> </ul>

### SENSITIVE PRACTICE

- A disproportionate number of women with mental health problems have suffered childhood sexual abuse
- Treat all women with the highest standards of care
- Give woman as much sense of safety/control/respect as possible. In particular:
  - ask her choice of name
  - do not use endearments e.g. love, dear, good girl
  - do not ask intrusive questions about her past
  - avoid touch – respect personal space
  - obtain history before asking her to remove any clothing
  - explain relevance of enquiries
  - ensure privacy for dressing/undressing and ask permission to re-enter
  - offer a cover for modesty
  - ensure she understands she can ask you to slow down/pause during physical examination
  - ask if she is comfortable and ready to continue when moving from one part of body to next
  - be aware of body language indicating discomfort
  - before moving to another part of body, tell the woman and explain why
  - ensure doors are closed and no one enters room
  - avoid delay – be prepared e.g. have all equipment ready
  - explain equipment used
  - do not assume because consent is given at 1 assessment it will be given for another
  - see the woman fully dressed after each appointment to reinforce that you see her as a whole person
  - monitor her body language and sympathetically address apparent discrepancies between verbal and non-verbal responses

### DEFINITION

- Placenta adheres to or invades the myometrium

### Increased incidence

- If placenta is located over a previous scar
- With increasing number of caesarean sections (CS)
- Following myomectomy
- If previous manual removal of placenta from the same placental site

***Morbidly adherent placenta carries an increased risk of mortality due to massive obstetric haemorrhage at delivery***

### ANTENATAL CARE

- Advise ultrasound scan at 20 weeks' gestation to determine placental site
- if scan reveals a low or anterior placenta with a history of previous CS, further ultrasound scan at 32 weeks' gestation to identify distance from lower edge of the placenta to cervical os and determine whether the placenta overlies the old scar
- report signs of invasion of the scar by placental tissue
- a colour-flow Doppler ultrasound scan performed by an experienced sonographer is the first line diagnostic test
- Where the placenta lies over the old scar, or in placenta praevia, consultant obstetrician will discuss with woman (and her partner if appropriate) and plan antenatal care including further imaging and multidisciplinary preparation and delivery
- MRI scan, arranged with a consultant radiologist, can aid diagnosis and clarify depth of invasion
- Since up to 40% of cases are likely to require emergency delivery, place a clear care plan in woman's healthcare record and hand-held notes

- Discuss the risk of hysterectomy
- Re-check haemoglobin >32 weeks' gestation and, if anaemic, prescribe oral iron
- Refer woman to an obstetric anaesthetist

### Advice to woman

- If appropriate, inform woman and her partner about the risk of major haemorrhage and advise to:
  - avoid sexual intercourse for the remainder of the pregnancy
  - contact maternity triage to attend hospital immediately if any vaginal blood loss, contractions, pain or suprapubic period-like aches
  - ensure someone available at home who can help and take to hospital if necessary

### ELECTIVE DELIVERY

- Schedule elective CS at 36–37 weeks' gestation
- Give antenatal steroids to reduce risk of respiratory distress syndrome
- Multidisciplinary planning involving consultant obstetrician, consultant anaesthetist and haematologist
- Ensure 4–6 units of packed red blood cells available in delivery suite blood fridge on morning of procedure and senior haematologist available for advice
- Experienced neonatologist to be present at birth
- A scan on morning of procedure may be useful in mapping placental site
- Where there is high probability of a morbidly adherent placenta it may be appropriate to liaise with an interventional radiologist if available locally
- may be appropriate to insert balloons in the femoral arteries before procedure as a prophylactic measure for inflation in the event of postpartum haemorrhage. Particularly appropriate for women who will not consent to a blood transfusion

## MORBIDLY ADHERENT PLACENTA • 2/2

- Set up cell salvage if used routinely, or arrange a perfusionist to facilitate cell salvage if required
- Ensure local availability of enhanced maternity care after surgery

### Consent

- Must be taken by a consultant obstetrician who will discuss blood transfusion, hysterectomy, admission to critical care and the possibility of leaving the placenta in place. It will include routine consent for CS
- If placenta left *in situ* – pregnancies have been reported after this approach but so have cases of delayed haemorrhage and hysterectomy

### Procedure

- Consultant obstetric anaesthetist will determine and administer type of anaesthetic
- Consultant obstetrician must perform CS
- It may be appropriate to open the lower segment of the uterus, thus leaving a lower segment scar only. However, it may be appropriate to access the uterine cavity deliberately avoiding the placenta. This requires knowledge of the limits of the placental site. This approach allows an assessment of placental adherence without heavy bleeding before a definitive decision is made
- If the placenta separates, the operation continues as normal
- If it remains adherent, there are 2 options:
  - proceed directly to hysterectomy or
  - leave the placenta *in situ* and manage conservatively in the postnatal period
- Even if placenta is thought to be morbidly adherent and not bleeding at time of CS, give 5 units of Syntocinon® IV slowly to ensure placenta does not separate and is truly adherent
- If placenta is clearly adherent, do not continue to remove it

- there is reduced need for transfusion if no attempt is made to remove the placenta both before hysterectomy and before leaving placenta *in situ*
- If plan of care is to manage the placenta *in situ* conservatively, unclamp the cord and drain the placenta of blood before tying off and dividing the cord as close to its insertion into the placenta as surgically practicable
- Close the uterus in the routine way or proceed directly to hysterectomy
- If the placenta separates, partially adherent portion(s) can be left in place. Heavy blood loss can occur – see **Postpartum haemorrhage** guideline

### Postnatal care

- Provide enhanced maternity care after delivery. Do not transfer to postnatal ward for  $\geq 2$  hr after delivery
- Regularly assess uterine fundus and observe carefully for signs of haemorrhage. Where a placenta totally covering the cervical os is left *in situ*, it can conceal bleeding within the uterine cavity. In this situation, woman should remain on delivery suite for 24 hr

### Management when placenta left *in situ* postnatally

- Carries risk of infection and delayed haemorrhage. Ensure woman understands the need for a commitment to hospital visits for clinical checks, blood tests and possibly imaging
- Antibiotic prophylaxis can be used a few days after delivery but postnatal follow-up with prompt recognition and treatment of any infection is more important. This requires twice-weekly hospital visits with clinical review, blood tests for FBC and C reactive protein
- Monitor placental re-absorption weekly with serum Beta hCG levels and ultrasound. There have been reports of methotrexate use and of elective ERPC at 6 weeks postnatally

**RISKS**

Multiple pregnancy is associated with higher risks of adverse outcomes for mother and babies

**Maternal**

- Miscarriage
- Anaemia
- Placenta praevia
- Hypertensive disorders
- Haemorrhage
- Operative delivery
- Postnatal illness
- Maternal mortality associated with multiple births is 2.5 x that for singleton births

**Fetal/baby**

- Small for gestational age
- Congenital malformation
- Cerebral palsy (4 x higher)
- Birth asphyxia higher for second twin, usually occurs after delivery of first twin
- Twin-to-twin transfusion in monozygotic twins
- Cord entanglement and locking in monochorionic monoamniotic twins
- Preterm labour
- Stillbirth
- Perinatal mortality (6 x higher)

**ANTENATAL MANAGEMENT**

- Follow local antenatal care pathway
- For many women a multiple pregnancy will be detected only after first ultrasound scan
- If multiple pregnancy suspected arrange early ultrasound scan to confirm
- In twin pregnancy ultrasonographer will determine chorionicity in the first trimester. Chorionicity determines the degree of risk and management
- When confirmed arrange consultant-led care

**Communication**

- Discuss plan of care with parents
- Provide psychological support and, where possible, written information and contact details of multiple pregnancy support groups

**Plan of care (in addition to routine antenatal care)**

- Undertake FBC at 20–24 weeks' gestation and have low threshold for iron and folic acid supplementation
- Offer first trimester combined Down syndrome screening
- Offer second trimester screening with appropriate counselling
- At each antenatal examination >24 weeks' gestation, confirm presence of 2 fetal hearts using Pinard stethoscope, sonic aid or ultrasound scan
- If woman has  $\geq 1$  of the following hypertension risk factors, advise to take 75 mg of aspirin daily from 12 weeks until birth:
  - first pregnancy
  - aged  $\geq 40$  yr
  - pregnancy interval  $>10$  yr
  - BMI of  $\geq 35$  kg/m<sup>2</sup> at first visit
  - family history of pre-eclampsia
- Monochorionic pregnancy between 16–24 weeks' gestation:
  - scan every 2 weeks, looking for twin-to-twin transfusion syndrome (TTS)
  - if TTS suspected, refer to local fetal medicine consultant
- Dichorionic pregnancy and monochorionic pregnancy  $>24$  weeks:
  - perform serial growth scan  $\geq 4$  weeks
  - 20 week detailed scan to detect fetal anomalies
- If growth of 1 of the fetuses falls below projected centile, ask consultant obstetrician to plan further management
- In the event of death of 1 twin, discuss with fetal medicine consultant

### Communication

- Discuss plan of care with parents, ensuring sufficient information given
- Provide psychological support and, where possible, written information and contact details of multiple pregnancy support groups

### Delivery plan

- Discussion  $\leq 24$  weeks about risks, signs and symptoms of preterm labour and possible outcomes of preterm birth
- If delivery by pre-labour caesarean section (CS), administer antenatal steroids for fetal lung maturity

### Twins

- Detailed counselling by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) regarding mode, place and timing of delivery  $< 32$  weeks
- Monochorionic monoamniotic pregnancy: offer CS at 32 weeks
- consider earlier delivery and by pre-labour CS due to risk of cord entanglement
- Inform women that:
  - 60% of twin pregnancies result in spontaneous birth  $< 37$  weeks
  - elective birth  $\geq 36$  weeks for monochorionic twins, and  $\geq 37$  weeks for dichorionic twins, does not appear to be associated with increased risk of serious adverse outcomes
  - continuing uncomplicated twin pregnancies  $> 38$  weeks increases risk of fetal death
- Offer elective birth at:
  - 36 weeks for monochorionic twin pregnancies, after a course of corticosteroids, 37 weeks for dichorionic twin pregnancies

### Triplets and higher order pregnancies

- Must be delivered in a unit with sufficient and appropriate neonatal intensive care (NICU) facilities
- Inform women that:
  - 75% of triplet pregnancies result in spontaneous birth  $< 35$  weeks
  - continuing uncomplicated triplet pregnancies  $> 36$  weeks increases the risk of fetal death
- Offer elective birth from 35 weeks, after a course of corticosteroids has been offered

### If elective birth is declined in multiple pregnancy

- Offer weekly appointments with consultant obstetrician
- offer ultrasound scan at each appointment
- perform fortnightly fetal growth scans, and as a minimum weekly liquor and UA Doppler assessments and weekly biophysical profile assessments

### INTRAPARTUM MANAGEMENT (TWIN PREGNANCY)

#### First stage of labour

- On admission, inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) and consultant
- Confirm presence of 2 fetal hearts using Pinard stethoscope or sonic aid
- if 2 separate fetal hearts difficult to identify, ultrasound scan
- Unless contraindicated because of extreme prematurity, continuous electronic monitoring of fetal hearts
- if difficulty monitoring 2 separate fetal hearts at any time, consider fetal scalp electrode or ultrasound scan

***Inability to continuously monitor both babies despite use of ultrasound scan to ascertain placement of transducers and a fetal scalp electrode if appropriate, is an indication for CS***

- Insert IV cannula and flush
- Take blood for FBC and group and save
- Review obstetric records, fetal presentation and plan for delivery
- discuss plan of care with parents and document in maternal healthcare record
- While respecting woman's choice, encourage her to use epidural analgesia to facilitate delivery in the event of internal manoeuvres or urgent instrumental delivery becoming necessary
- If oxytocin required to accelerate labour [prescribed by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant only], use with caution

### Second stage of labour

#### Ensure

- Experienced obstetric consultant, middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow), neonatology team and midwives are present in room at delivery
- Appropriate equipment, including:
  - ultrasound machine
  - resuscitation equipment
- Anaesthetist and theatre team on standby on labour ward
- In the case of CS, 1 midwife per baby is designated to receive the babies
- Oxytocin as per local practice
- If all normal, midwife will carry out delivery, otherwise middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant will perform
- Deliver twin 1 and place 1 clamp on umbilical cord

### Delivery of second twin

- Aim to deliver second twin  $\leq 30$  min
- risk for second twin increases steeply as time passes from delivery of first twin

- Continuous electronic fetal monitoring
- Determine presentation and lie
- Monitor vaginal loss
- Perform abdominal palpation to determine presentation. At the same time, perform a vaginal examination – preferably by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant to allow interventions, if appropriate, without repeat examination
- where second twin was not cephalic in first stage of labour, it may be appropriate to deliver the woman in lithotomy to allow rapid vaginal examination of second twin and perform interventions as required
- Stabilise second twin as longitudinal lie
- Prepare ultrasound machine in case required to confirm position of second twin
- If necessary, perform external cephalic version
- If necessary, perform internal podalic version and breech extraction before cervix can shrink
- If any delay in resumption of effective uterine contractions, start oxytocin infusion according to local practice at maximum rate
- If vertex or breech in pelvis, perform artificial rupture of membranes at peak of contraction
- After delivery of second twin, place 2 clamps on umbilical cord

### Active management of third stage of labour

- Routine active management third stage, see **Third stage of labour** guideline. In addition:
  - oxytocin infusion as per local practice
  - cord gases
  - because of risk of haemorrhage, avoid too rapid transfer to postnatal ward

## INTRODUCTION

- Neurological deficits after regional anaesthesia or analgesia:
  - can be temporary or permanent
  - have a variety aetiologies; caused directly/indirectly
- Advise women about the risks, including neurological deficit, before administering regional anaesthesia or analgesia

## PRE-EXISTING NEUROLOGICAL DEFICITS

- May increase risk of new and progressive post-operative neurological complications
- Risk-benefit assessment to be carried out in women with:
  - pre-existing central nervous system (CNS) disorders: e.g. multiple sclerosis
  - diabetes mellitus
  - spinal stenosis or mass in spinal canal
  - extremes of body habitus

## EPIDURAL AND SPINAL ANAESTHESIA AFTER MAJOR SPINAL SURGERY

- Majority of these women suffer from chronic backache, have spinal stenosis and distorted spinal anatomy
- Epidural placement successful in majority of cases but complicated by:
  - multiple repeated attempts
  - traumatic catheter placement
  - inadequate epidural analgesia
  - dural puncture

## PREVENTING NEUROLOGICAL DAMAGE

- Before performing regional anaesthesia and analgesia, enquire about, and document, pre-existing neurological symptoms
- Avoid vasoconstrictors in women with pre-existing neurological conditions

- Reconsider the use of large volumes for epidurals in the presence of spinal stenosis
- Chlorhexidine 0.5% in alcohol spray is the skin preparation of choice
  - single spray is adequate
  - allow to dry completely
  - do not splash chlorhexidine on spinal or epidural needles
- If, on performing central nerve blockade (CNB), there are recurrent, persistent, bilateral or severe symptoms of dysaesthesia, reconsider further attempts
- Prevent prolonged periods of hypotensive episodes to maintain spinal cord perfusion
- Follow local guidance for regional blocks and regional anaesthesia for the anticoagulated woman
- Avoid neuroaxial procedures in the septic woman (discuss with on-call consultant anaesthetist) or in the presence of localised infection
- When topping up with heavy concentration of local anaesthetic, position the woman appropriately
  - obese – lateral tilt and ramped-up position
  - non-obese – shoulders raised

***Redosing of subarachnoid local anaesthetic beyond recommended doses may increase the risk of spinal cord neurotoxicity***

## RECOGNITION OF NEUROLOGICAL DEFICIT

- Early detection is critical in managing spinal cord ischaemia, vertebral canal haematoma and abscess. >8 hr, the likelihood of full or partial recovery rapidly diminishes

## Dense block after regional analgesia

- If abnormal block develops on routine epidural analgesia regimen, stop infusion immediately
- If a dense blockade develops, call consultant anaesthetist urgently

- If not recovered in 4 hr, consider prompt MRI scan
- If recovery occurs, restart epidural infusion but maintain neurological surveillance
- If block recurs, abandon epidural and investigate
- Continue neurological assessment in HDU for 24 hr
- If haematoma suspected, do not remove catheter

***Subdural block can cause a dense, very persistent block that is frequently unilateral***

## **Neurological impairment after CNB**

- See – **Flowchart: Management of a neurological deficit after CNB**
- Presentation will vary with aetiology
- Epidural haematoma progresses rapidly; signs may be unilateral
- Cauda equina compression presents as: saddle anaesthesia, urinary retention and reduced anal tone
- Disc herniation presents as: severe back pain, bilateral sciatica and motor weakness in legs
- Nerve damage by epidural and spinal needles is associated with paraesthesia
- Meningitis after dural puncture usually presents with severe headache. Onset of nuchal rigidity, photophobia, confusion and pyrexia may be delayed

## **MANAGEMENT OF NEUROLOGICAL INVOLVEMENT**

### **Review history – test for neurological involvement**

- Test myotomes, dermatomes, reflexes and sphincter tone

### **Red flags**

- Unexpected dense motor block
- Markedly increasing motor block, including unilateral block, motor block that does not recede and recurrent motor blockade

- Severe or worsening backache
- Bowel and bladder dysfunction
- Radicular pain

### **Urgent (infective/space occupying lesions suspected)**

#### ***Infective meningitis suspected***

- Immediately consult neurologist
- Early diagnostic lumbar puncture and antibiotics

#### ***Complete or progressive neurological deficits***

- Urgent evaluation by spinal surgeon
- Urgent MRI scan

#### ***Lesions with moderate–severe deficits***

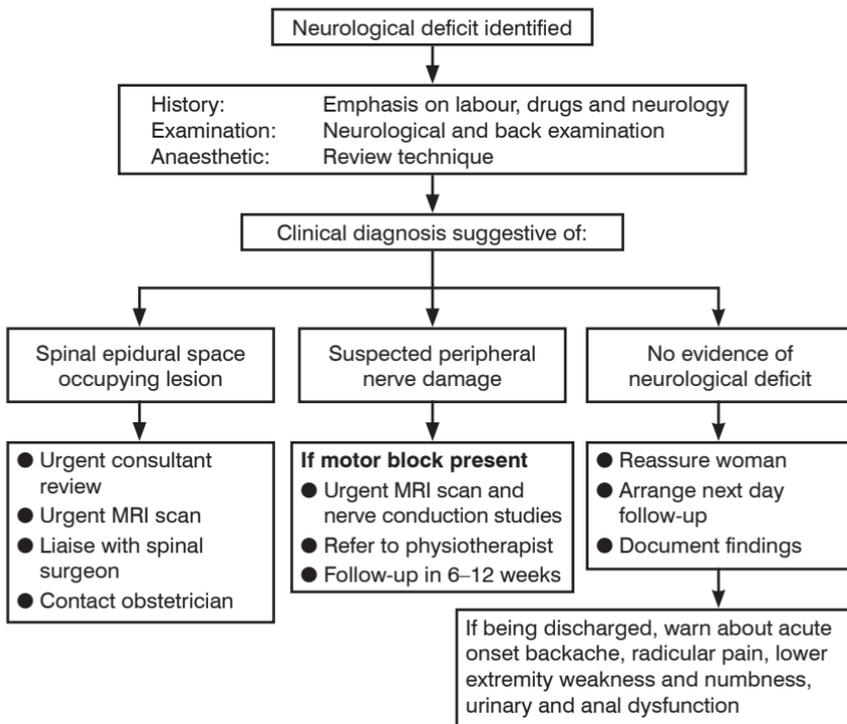
- Require urgent referral to either spinal surgeon or neurologist
- Consider MRI scan

#### **Not urgent**

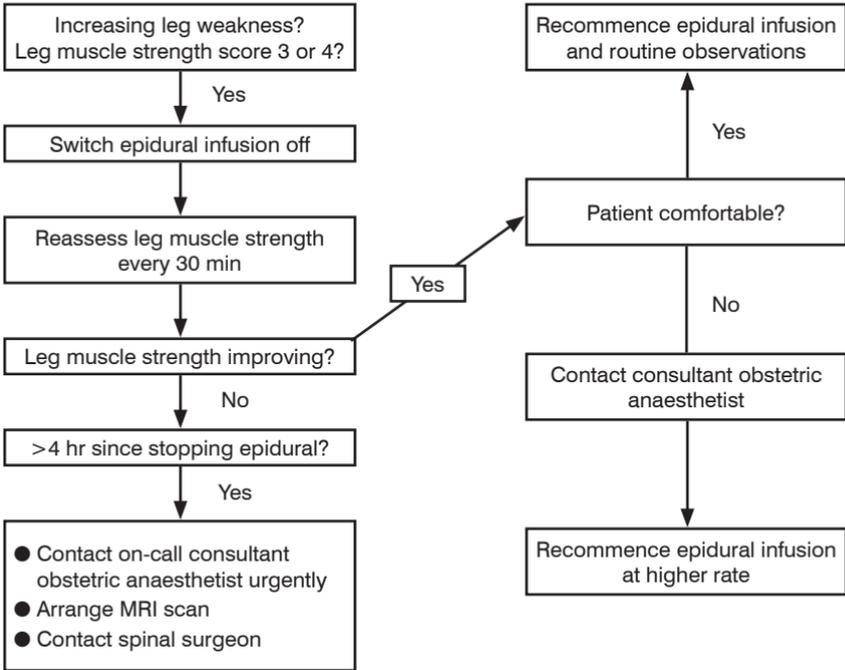
#### ***Mild or resolving symptoms***

- Without objective evidence of neural deficit typically indicates excellent prognosis requiring reassurance only
- If no improvement in 4–6 weeks, seek neurological advice and refer to neurologist
- Neurophysiological investigation with MRI scan can help quantify and locate injury site. Neurophysiological changes most apparent >14–21 days of injury
- After initial evaluation, follow-up incompletely and unresolved injuries in 3–5 months

**Flowchart: Management of a neurological deficit after CNB**



**Leg weakness with epidural analgesia –  
Management flowchart for midwife**



## NORMAL LABORATORY VALUES IN PREGNANCY • 1/1

Laboratory test	Value
Hb	110–140 g/L
WCC	6–16 x 10 <sup>9</sup> /L
Platelets	150–400 x 10 <sup>9</sup> /L
MCV	80–100 fl
CRP	0–7 g/L
Sodium	130–140 mmol/L
Potassium	3.3–4.1 mmol/L
Urea	<4.5 mmol/L
Creatinine	<75 µmol/L
Urates	<380 µmol/L If 350–380, registrar/consultant reviews notes
24 hr protein	0.3 g
Protein creatinine ratio	<30 mg/mmol
Creatinine clearance	80–170 mL/min
Bilirubin	≤16 µmol/L
Total protein	48–64 g/L
Albumin	28–37 g/L
AST	10–30 iu/L
ALT	6–32 iu/L
Gamma GT	3–43 iu/L
Alkaline phosphate	30–418 iu/L
Bile acids	≤14 µmol/L

**DEFINITION**

- Body mass index (BMI) = weight in kg/height in metres squared (m<sup>2</sup>)

**Table 1: Classification of body mass index**

Classification	BMI	Risk of co-morbidities
Underweight	<18.5	Low (but increased risk of other clinical problems)
Desirable weight	18.5–24.9	Average
Overweight	25.0–29.9	Mildly increased
<b>Obese</b>	>30.0	
Class I	30.0–34.9	Moderate
Class II	35.0–39.9	High
Class III (severely or morbidly obese)	>40.0	Very high

- WHO classifies women with BMI >30 as obese
- Risks associated with pregnancy and childbirth are significant when BMI >35
- In this guideline, obesity will be defined as ≥35 kg/m<sup>2</sup> during pregnancy, delivery and postnatal period

**RISKS OF OBESITY**

Mother			Baby
Pregnancy	Intrapartum	Postnatal	
<ul style="list-style-type: none"> <li>● Maternal death or severe morbidity</li> <li>● Cardiac disease</li> <li>● Spontaneous first trimester and recurrent miscarriage</li> <li>● Pre-eclampsia and hypertension</li> <li>● Thromboembolism</li> <li>● Gestational diabetes</li> <li>● Infection e.g. urinary tract infection, genital infection</li> <li>● Difficulties with venepuncture/ abdominal examination/ blood pressure assessment</li> </ul>	<ul style="list-style-type: none"> <li>● Increased risk of difficult fetal monitoring</li> <li>● Difficulty achieving effective regional and general anaesthesia</li> <li>● Inadequate analgesia</li> <li>● Increased anaesthetic risks</li> <li>● Increased need for induction of labour</li> <li>● Slow progress in labour</li> <li>● Shoulder dystocia</li> <li>● Operative delivery</li> <li>● Increased risk of emergency caesarean section (CS)</li> <li>● Difficult CS with greater mortality and morbidity</li> <li>● Moving and handling injuries to woman and staff</li> </ul>	<ul style="list-style-type: none"> <li>● Thromboembolism</li> <li>● Increased maternal mortality</li> <li>● Post CS wound infection</li> <li>● Infection from other causes</li> <li>● Postpartum haemorrhage</li> <li>● Perineal tears</li> <li>● Low breastfeeding rates</li> </ul>	<ul style="list-style-type: none"> <li>● Congenital abnormalities</li> <li>● Undetected abnormalities (limitations of ultrasound)</li> <li>● Prematurity</li> <li>● Stillbirth and neonatal death</li> <li>● Macrosomia (birth trauma) with associated risk of shoulder dystocia</li> <li>● Fetal abnormalities including neural tube defect</li> <li>● Admission to neonatal intensive care unit (NICU)</li> <li>● Intrauterine growth restriction (IUGR)</li> <li>● Obesity (in later life)</li> </ul>

**ENVIRONMENT AND EQUIPMENT**

- Adequate doorway widths and thresholds
- Theatre trolley and operating table able to take weight >180 kg
- Examination and ultrasound couch able to take weight >180 kg
- Delivery and ward bed able to take weight >180 kg
- Moving equipment e.g. hover mattress or hoist
- Large chairs without arms
- Large wheelchairs
- Calibrated weighing scale
- Height measuring equipment
- Range of epidural and spinal needles, including extra-long
- Appropriately sized thromboembolic stockings
- Appropriately sized theatre gowns
- Large blood pressure cuffs

**MANAGEMENT BEFORE CONCEPTION**

- Offer pre-pregnancy counselling on lifestyle, diet and smoking cessation
- encourage women who wish to lose weight to follow a weight reduction programme and take regular exercise ≥2–3 months before pregnancy
- consider referral to dietitian
- consider referral to smoking cessation advisor (if available)
- Screen for diabetes
- High dose folic acid 5 mg/day for 3 months before conception
- Record blood pressure

***Obese women require the same routine antenatal, intrapartum and postnatal care as all other women***

**INITIAL ANTENATAL CARE**

- Refer for consultant-led care and advise woman to give birth in a consultant-led unit
- if woman requests home birth, inform professional midwifery advocate (PMA)

- Venous thromboembolism (VTE) risk assessment and follow **VTE thromboprophylaxis** guideline
- Early booking visit to antenatal clinic to plan pregnancy

**At booking**

- Measure height and weight and calculate BMI for all women
- note interpregnancy weight change
- Record arm circumference (to ensure appropriate BP cuff used) in maternal healthcare record

Cuff	Arm circumference range at midpoint (cm)
Adult	27–34
Large adult	35–44
Adult thigh cuff	45–52

- Assess VTE risk
- if low molecular weight heparin indicated, give weight appropriate dose
- Inform scan department of need for appropriate couch and longer appointment time (if local practice)
- Anticipate requirement for specific equipment during labour and document in maternal healthcare record

**Prophylaxis treatment**

- Advise vitamin D supplement ('Healthy Start' vitamins)
- Severely obese women (BMI >35 kg/m<sup>2</sup>) plus 1 additional risk factor for hypertensive disease, prescribe aspirin 75 mg/day from 12 weeks' gestation

**Discussion with woman**

- Explain significance of BMI to woman. Provide advice on weight management, including lifestyle and diet
- where available, give written information on diet and risk of obesity in pregnancy

- Refer to dietician and/or weight management programme according to local protocol
- advise  $\geq 30$  min/day moderate physical activity (e.g. walking, swimming, aqua-natal) on  $\geq 5$  days/week
- Refer for smoking cessation
- Advise breastfeeding

### Communication

- Complete local alert form
- Discuss with manual handling department to ensure appropriate equipment available
- Inform senior delivery suite midwife to ensure availability of appropriate equipment – see **Environment and equipment**
- If mobility reduced, seek advice from manual handling department

### SUBSEQUENT ANTENATAL CARE

- Routine antenatal care and:
  - it may be appropriate to re-weigh woman in third trimester
  - serial ultrasound scan for fetal growth
  - increased risk of gestational diabetes – book GTT at 26–28 weeks' gestation
- If admitted to hospital or other intercurrent problems develop, repeat VTE risk assessment
- In third trimester with BMI  $> 40$ 
  - provide information about tissue viability
  - manual handling assessment
- Offer continued advice and support. Encourage weight gain to be kept to 7–10 kg

### ANAESTHETIC ASSESSMENT AND MANAGEMENT

- If BMI  $> 40$  refer to anaesthetist (give anaesthetics information leaflet if available locally)

### Assessment

- Consider likelihood of difficult intubation and airway management – see **General anaesthesia and failed intubation** guideline
- Other comorbidities may impact on anaesthesia:
  - hypertension
  - ischaemic heart disease
  - respiratory distress
  - sleep apnoea
  - diabetes
  - assess difficult IV cannulation and lumbar anatomy
- Assess on individual basis and according to local protocol

### Management

- If anaesthetic or airway management problems anticipated, ask anaesthetist to review who will:
  - document plan of care clearly in maternal healthcare record
  - discuss plan of care with woman

### INTRAPARTUM CARE

- Individual plan of care depending on woman's needs
- Review antenatal anaesthetic assessment and obstetric plan
- Tissue viability assessment and manual handling assessment for labour as per local practice
- Notify duty anaesthetist and middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) of admission
- Cannulate using wide bore cannula (BMI  $> 40$ )
- Bloods for FBC and group and save (BMI  $> 40$ )
- Risk assessment for thromboembolism, document and follow plan
  - thromboembolic stockings (if local practice)
- Early epidural may be required for regional analgesia

**Monitor**

- Fetal monitoring – see **Electronic fetal monitoring (EFM) guideline**
- where difficulty monitoring fetal heart with EFM, apply fetal scalp electrode (FSE)
- If uncertainty about fetal presentation, consider ultrasound scan
- Monitor progress in labour closely. Be aware of increased risk of shoulder dystocia and postpartum haemorrhage (BMI >40)

**First and second stage of labour**

- Keep as mobile as possible
- Maintain hydration
- Antacid (e.g. ranitidine) as per local policy
- Pressure area care
- If instrumental delivery contemplated, consider performing trial in theatre with an experienced obstetrician (following usual discussion of risks and alternatives). Obesity is a recognised predictor of abandoned trial, shoulder dystocia and birth injury

**Third stage of labour**

- Active management
- Oxytocin infusion over 4 hr following delivery to reduce risk of postpartum haemorrhage
- Care when putting woman in lithotomy to avoid tissue damage

**Caesarean section (CS)**

- If CS considered – seek advice from consultant obstetrician and anaesthetist – see **Caesarean section guideline**
- Administer antibiotic prophylaxis at time of surgery
- Due to risk of poor wound healing, especially if BMI >40, use delayed absorbable suture e.g. PDS for rectus sheath closure
- close subcutaneous fat to prevent wound infection and dehiscence

- a suction drain can be left above sheath, and interrupted sutures can be used for skin
- Use correct equipment for patient handling including theatre table and bed – see **Equipment**

**POSTPARTUM CARE**

- If operative delivery, consider transfer to high dependency area for immediate postnatal care – see **High dependency care guideline**
- Thromboembolism risk assessment immediately after delivery
- thromboprophylaxis – see **VTE – Thromboprophylaxis guideline**
- adequate analgesia to allow early mobilisation
- thromboembolic stockings
- encourage good hydration
- If intrathecal opiates not used, consider patient controlled analgesia (PCA)
- Obesity carries increased risk of postnatal wound and genital tract infection. Encourage good hygiene and monitor for signs of infection
- If CS carried out, observe for wound infection, wound dehiscence, DVT, PE and chest infection

**PLAN FOR DISCHARGE**

- Continue to encourage healthy eating and exercise, reinforcing benefits of a healthy BMI for future wellbeing and subsequent pregnancies. Consider dietitian referral
- Consider referral to physiotherapist
- Unless contraindicated, encourage breastfeeding. Obese women have decreased rates of breastfeeding (initiation and maintenance) but it can help with postnatal maternal weight loss
- Postnatal visiting schedule based on individual needs
- Offer family planning and contraceptive advice

**Do not attempt procedure unless criteria for safe delivery have been met (see Table)**

## INDICATIONS

### Fetal

- Presumed fetal compromise developing in second stage

**If fetal compromise suspected, confirmation using fetal blood sampling (FBS) is preferable before a difficult instrumental delivery**

### Maternal

- Medical indications (e.g. cardiac disease, cerebrovascular disease and hypertension)

## Delay in second stage of labour

- See **Delay in labour** guideline
- In the absence of other concerns, maternal exhaustion, etc.

### Other

- After-coming head of the breech

## CONTRAINDICATIONS

- Vacuum extractor contraindicated with a face presentation
- **Avoid:**
  - use of vacuum <34 weeks' gestation because of preterm susceptibility to cephalohaematomata, intracranial haemorrhage and neonatal jaundice
  - metal cups <36 weeks' gestation
  - forceps/vacuum extraction deliveries before full dilatation of cervix

## CRITERIA FOR SAFE OPERATIVE VAGINAL DELIVERY

	Essential
Full abdominal and vaginal examination	<ul style="list-style-type: none"> <li>● Head &lt;1/5 palpable per abdomen</li> <li>● Vertex presentation</li> <li>● Cervix fully dilated and membranes ruptured</li> <li>● Exact position of head determined so that instrument can be placed properly</li> <li>● Pelvis deemed adequate</li> <li>● Optimise contractions</li> </ul>
Mother	<ul style="list-style-type: none"> <li>● Clear explanation given and informed consent obtained and documented (including episiotomy)</li> <li>● Continuous electronic fetal monitoring</li> <li>● Appropriate analgesia in place:                             <ul style="list-style-type: none"> <li>● regional block</li> <li>● pudendal block</li> <li>● local infiltration</li> </ul> </li> <li>● Maternal bladder emptied – consider use of in/out catheter or, if indwelling catheter <i>in situ</i>, deflate balloon (recommended practice)</li> <li>● Aseptic technique</li> </ul>
Staff	<ul style="list-style-type: none"> <li>● Operator has been assessed as competent in the use of forceps and vacuum extractor</li> <li>● Adequate facilities and back-up personnel must be available</li> <li>● Back-up plan in place in case of failure to deliver</li> <li>● Anticipation of complications (e.g. shoulder dystocia, postpartum haemorrhage)</li> <li>● Personnel trained in neonatal resuscitation e.g. midwife or ANNP/ neonatologist (according to local policy) are present</li> </ul>

### TRIAL OF OPERATIVE VAGINAL DELIVERY IN THEATRE

- If there is doubt as to whether instrumental delivery will succeed, conduct delivery as a trial of vaginal delivery in theatre where, should a caesarean section (CS) be required, theatre team and anaesthetist are present
- appropriately trained person must undertake or supervise in theatre
- Consider instrumental delivery in theatre particularly in the following situations:
  - multiparous women; especially with a previous vaginal delivery
  - mid-cavity deliveries or where head palpable in the abdomen
  - position is not occipito-anterior
  - obese women where assessment of fetal size is difficult
  - there has been delay in labour despite oxytocin
  - estimated fetal weight >4000 g

### Higher rates of failure are associated with

- Maternal obesity BMI >30
- Clinically big baby/estimated fetal weight >4000 g
- Malposition
- Mid-cavity delivery

### PROCEDURE

#### What instrument?

- Doctor should choose instrument most appropriate to clinical circumstances and their level of expertise. Forceps and vacuum extraction are associated with different benefits and risks:
  - Ventouse associated with more neonatal trauma and higher risk of failure
  - forceps associated with more perineal trauma and 3<sup>rd</sup> and 4<sup>th</sup> degree tears

- Kielland's forceps should be used unsupervised only by those trained and assessed as competent in their use

### Dual instrumental delivery

- Dual instrumental delivery is associated with an increased risk of trauma and neonatal morbidity
- If satisfactory descent and/or rotation achieved before displacement of the vacuum, it is acceptable to complete a delivery with outlet forceps
- Attempt when it is very likely that a vaginal delivery will be successful (e.g. good descent of head in the perineum and detachment of Ventouse cup)

### When to abandon operative vaginal delivery

- When there is no evidence of progressive descent with each pull, or where delivery is not imminent following 3 tractions of correctly applied instrument (cup or forceps) by an experienced doctor or application of Ventouse cup – should not exceed 15 min
- If delivery is thought to be imminent, with head in the perineum, it may, after careful re-evaluation, be appropriate to await one more contraction
- Poor progress or descent or concerns about fetal wellbeing should indicate the need to abandon the procedure (even if an episiotomy has been performed) and perform CS for the safety of mother and baby
- Follow local incident reporting procedure for unsuccessful forceps/vacuum delivery

### DOCUMENTATION

#### Clearly document in maternal healthcare record

- Informed consent obtained
- Analgesia used
- Maternal bladder catheterised
- Use of instruments:
  - number of pulls
  - descent of head
  - number of cup detachments
  - total cup application time
- Episiotomy/tear findings and repair technique
- Paired cord gas blood results – see **Umbilical cord sampling** guideline
- Swabs, needles, tampons (if used) to be counted before and on completion of procedure
- Record of incident report (if local practice)

### AFTERCARE

- Perform local VTE risk assessment
- Give regular analgesia. If no contraindications, consider paracetamol and diclofenac PR/ ibuprofen PO
- Bladder management – see **Bladder care** guideline
- Refer to local guidance on postnatal observations of the neonate

### FOLLOW-UP

- An obstetrician (ideally who performed delivery) should discuss procedure, management of any complications and future deliveries with mother

## INDICATIONS

- Induction of labour after artificial rupture of membranes (ARM)
- Acceleration/stimulation of labour after pre-labour rupture of membranes (PROM)
- prostaglandin induction may be appropriate before this – see **Pre-labour rupture of membranes (PROM) guideline**
- Augmentation when rate of progress in labour is considered unsatisfactory – see **Delay in labour guideline**
- For prevention of postpartum haemorrhage following delivery where there is an increased risk of bleeding – see **Postpartum haemorrhage guideline**

## Assessment before oxytocin

- Before commencing oxytocin, midwife must confirm presentation is cephalic and membranes are ruptured

***Before commencing oxytocin on a multiparous woman for delay in labour, an obstetrician of at least middle grade (ST3–7 or equivalent e.g. staff grade, clinical fellow) status must personally assess woman and perform abdominal palpation and vaginal examination***

- If previous caesarean section, the use of oxytocin should be or have been discussed with a consultant

## Contraindications

- Non-rupture of membranes
- there are rare exceptions but these are consultant decision only

***Do not commence oxytocin within 6 hr of administration of prostaglandin gel or tablet or ≤30 min of removal of Propress pessary to prevent hyperstimulation – see Induction of labour guideline***

## Monitoring

- Monitor fetus by continuous electronic fetal monitoring (EFM)
- if EFM non reassuring or abnormal, stop oxytocin until assessment by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Perform routine maternal observations – pulse, blood pressure and temperature and record in partogram
- Perform vaginal examination ≤6 hr after start of oxytocin and record planned timing of next vaginal examination
- Record individual management plan in intrapartum notes

## OXYTOCIN REGIMEN

- Administer oxytocin through an infusion pump or syringe driver using a Y-connector. This acts as a non-return valve to minimise risk of oxytocin being forced up into a second infusion and flushed through later as a bolus
- Use local regimen for oxytocin
- Increase infusion rate at ≤30 min intervals and by no more than the steps in the table, until contractions are adequate
- There should be <4–5 contractions every 10 min
- Once contractions established, especially in a parous woman, it may be possible and desirable to stop the infusion. Experience in the use of oxytocin is to be valued – seek the advice of midwife co-ordinator and middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant early

### Suggested regimen

Time after starting (min)	Equivalent milliunits/min
0	1
30	2
60	4
90	8
120	12
150	16
180	20

### Hyperstimulation

- Stop oxytocin and call middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- If stopping oxytocin does not correct hyperstimulation, consider tocolysis with terbutaline 250 microgram SC
- Consultant obstetrician to decide whether and when to restart oxytocin

## INTRODUCTION

- A parent's relationship with their baby can begin long before birth. It is possible for parents to grieve for babies who die before birth, who are born and, for whatever reason, cannot survive and where pregnancy is terminated owing to abnormality
- When a pregnancy ends or a baby dies, for whatever reason, there are a number of shared elements and needs in the parents' experience of loss. Some aspects of grief are individual and very private, but should be supported by healthcare professionals. Aim to support parents and facilitate, as far as is possible, their individual needs
- do not make assumptions about what each parent will feel, want or need

***Treat parents and baby with respect, sensitivity and dignity at all times. Inappropriate care can lead to immense dissatisfaction and additional trauma***

## DEFINITIONS

### Intrauterine death (IUD)

- The absence of cardiac activity before birth

### Miscarriage

- A baby born before 24 weeks completed gestation, with no signs of life where an intrauterine death, or where an intrauterine death is diagnosed by ultrasound before 24 weeks' gestation

### Stillbirth

- A baby born  $\geq 24$  weeks completed weeks of pregnancy with no signs of life

### Neonatal death

- A death that occurs after birth, but before 28 completed days of life

## Signs of life

- A live birth is the delivery of a baby, irrespective of duration of pregnancy, which, after delivery, breathes or shows any other evidence of life, such as beating of heart, pulsation of umbilical cord, or any definite movement of voluntary muscles, whether or not umbilical cord has been cut or placenta attached
- it is important to distinguish between involuntary, physiological movements and signs of life. Observed movements such as jerk of a limb, or occasional gasp are not necessarily signs of life. Parents should be advised before birth, that this may happen. In these circumstances explain formal registration of neonatal death is not appropriate
- Required elements of care will depend on circumstances of loss:
  - termination of pregnancy for fetal anomaly
  - fetal loss <24 weeks' gestation
  - stillbirth
  - neonatal death
- Complete appropriate local checklist for particular circumstance to ensure no aspect of care is overlooked, even if woman chooses to decline some management options

## BEFORE ADMISSION TO DELIVERY SUITE

### Diagnosis

- Confirm diagnosis of intrauterine death by ultrasound scan carried out by 2 qualified and experienced operators
- Arrange review by consultant obstetrician and plan delivery
- Perform observations, MEWS score and record on local documentation
- Unless concerns for woman's safety (e.g. placental abruption, active sepsis), offer the choice to go home and return to delivery suite at a convenient  $\geq 24$ –48 hr later
- provide 24 hr contact number and where possible a named member of staff

- Some women will not want to go home and will be admitted soon after being informed of diagnosis of fetal death
- Advise the woman she may feel the baby shifting in the amniotic fluid. This can be distressing

### Breaking difficult news

- Inform parents as soon as anything worrying is suspected even if not yet confirmed or certain
- communicate this sensitively, acknowledging the difficulty of managing uncertainty
- unless an emergency, provide a woman who is alone the opportunity to call a partner, relative or friend for support and ask if she wishes to wait until they arrive before the finding is explained in detail
- If member of staff with parents at the time cannot provide accurate or sufficient information, he/she should inform parents and arrange for a more senior person to see them as soon as possible
- do not give parents inaccurate/incomplete information that they may later discover is incorrect
- Parents will often need time to take in what has been said to them. Give them as much time as possible, and be prepared to repeat some information. Written information and a contact telephone number are important

### Privacy

- Wherever possible, care for woman and family in bereavement suite
- Ensure all staff likely to be in contact with the family, including support and housekeeping staff, are aware of situation
- Inform the woman she determines who visits and when

### Information for parents

- Parents require information at every stage about what is happening, procedures and choices available

- Care should be parent-led where possible. Parents need non-biased and accurate information about the choices they face; where possible their choices should be supported
- when diagnosis confirmed, gently explain to woman and family the process of induction and time it may take. Give available written information to parents to reinforce discussions
- where English is not parents' first language or there is sensory impairment (e.g. deaf/deaf-blind), ensure interpreter available

### Documentation

- Document all discussions with parents in maternal healthcare record

### Liaison

- Delivery suite obstetric and midwifery team will liaise with:
  - specialist midwife for bereavement (if available)
  - neonatal unit (if appropriate)
  - fetal medicine
  - antenatal clinic
  - chaplaincy
  - general office
  - community midwives
  - GP
  - health visitor

### DELIVERY

- Discuss with woman the process, analgesia and support that will be offered in labour
- Most women will be advised to have a vaginal birth as it is safer and has less impact on future pregnancies
- For women who have had a previous caesarean section (CS), discuss mode of delivery with consultant obstetrician
- Complete a partogram during labour
- Discuss pain relief options
  - a platelet count may be required before epidural insertion where the woman has experienced an IUD

**Recommended drug regimen**

**Initial drug dose**

- Mifepristone (Mifegyne RU 486)  
200 mg oral administered by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant on licensed premises. Healthcare professional must observe woman take tablet
- Inform woman of possibility of abdominal discomfort and/or a small amount of bleeding
- reassure that this is normal and regular analgesia, e.g. paracetamol can be taken at home
- Ask woman to remain on premises for 1 hr to observe side effects
- if vomiting occurs, repeat dose
- Induction may commence at this point or, should the woman wish, she may go home and return ≤48 hr later
- Provide telephone numbers for delivery suite with instructions to call if she has any concerns while at home

**On admission/in labour**

- Consultant obstetrician to direct care
- Perform regular maternal observations (see **Labour management** guideline)
- Provide analgesia as required
- if woman requests an epidural, ensure platelet count is available

**Further drug regimen**

- No more than 24–72 hr after initial dose of mifepristone 200 mg oral, give misoprostol:
- **<27 weeks' gestation:** 100 microgram vaginally 6-hrly – **maximum 4 doses**
- **≥27 weeks' gestation:** 25–50 microgram vaginally 4-hrly – **maximum 6 doses**

*In previous CS or uterine surgery, where the cavity has been breached (e.g. myomectomy, uterine perforation) use 25–50 microgram dosage*

**Side effects of misoprostol**

- Pyrexia
- Diarrhoea
- Inform woman she may experience flu-like symptoms
- Particular care is required for women with:
  - severe asthma
  - previous CS
  - CVS insufficiency
  - hepatic or renal failure
  - adrenal suppression including long-term corticosteroid use

**FOLLOWING DELIVERY**

**Management of third stage**

- Give syntometrine (oxytocin with ergometrine) 1 mL IM after delivery
- If woman hypertensive, give oxytocin 10 units IM or 5 mg as a slow IV bolus as an alternative

*For Rh negative women, obstetrician will prescribe anti-D immunoglobulin*

**Lactation suppression**

- Inform women they may lactate
- Provide general advice e.g. wear well-fitting bra
- Offer cabergoline 1 mg for lactation suppression. Contraindicated for hypertensive women

**Parent involvement**

- If circumstances allow, involve parents in decisions regarding care of their baby
- Give parents the opportunity to see and hold their baby as soon as possible and for as long as they wish. Parents may initially decline to see their baby but should be assured they can change their mind at any time
- respect decision of parents who decide not to see and hold their baby

- Make use of local equipment to reduce deterioration in baby e.g. ice packs, cool cots etc.
- They may wish to give their baby a name
- When baby very small, it may be difficult to determine the sex by visual inspection. Where there is **any** doubt, midwife should **not** express an opinion even if pressed by parents to do so
- Obtain consent before carrying out any procedure e.g. obtaining mementos, including taking hand and footprints, photographs etc. Include parents in decisions and be guided by their wishes
- include parents in making these memories. Support them in washing/dressing their baby, taking photos or making the footprints themselves
- Middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant must see every baby following delivery regardless of gestation and carefully record presence or absence of any visible fetal abnormalities
- Written consent for examination of a fetus or baby, regardless of gestational age, must be obtained from parent by a healthcare professional competent to take consent for post mortem. Junior medical staff must **not** seek consent
- Allow time for questions
- Record discussion and consent in maternal healthcare record

### Placenta

- Where family requests post mortem, send placenta with baby
- If family do not want a post mortem, send placenta for histology to Birmingham Women's Hospital
- consent from the parent is not a legal requirement, but it is best practice to discuss this with the woman

### Cytogenetics

- Indications for cytogenetics
- severe IUGR or known visible fetal abnormality
- Obtain parental consent for cytogenetic investigations or molecular genetic studies of **any** material from **any** pregnancy loss regardless of gestation
- request by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant and appropriate form signed. This will form evidence of discussion between clinician and parents and of their consent
- unsigned requests will **not** be processed
- Send to regional genetics laboratory
- if any uncertainty whether test is appropriate, phone the regional genetics laboratory for advice

### Religious needs

- Ask parents if they have specific religious beliefs and offer to contact hospital chaplain/faith representative
- Do not make assumptions about what a parent may need/want depending on their religious, ethnic or socio-economic background
- Parents may wish to contact their own faith representative

### Investigations

- Middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow), consultant or specialist midwife for bereavement will discuss with parents

### Post mortem

- Obtaining consent from parents for post mortem can be difficult. Take into account feelings, emotions and religious beliefs of woman, partner and family

**Additional investigations**

Investigation	
<ul style="list-style-type: none"> <li>● Blood for TORCH (toxoplasma, rubella, cytomegalovirus and herpes simplex) and parvovirus</li> <li>● VDRL</li> <li>● High vaginal swab for sexual health screen</li> <li>● Endo-cervical swab for chlamydia</li> </ul>	Microbiology
<ul style="list-style-type: none"> <li>● U&amp;E</li> <li>● LFT</li> <li>● Uric acid</li> <li>● TFT</li> <li>● HbA<sub>1c</sub> and random glucose</li> <li>● CRP</li> <li>● Bile acids</li> </ul>	Clinical biochemistry
<ul style="list-style-type: none"> <li>● Group and save</li> <li>● Lupus anticoagulant</li> <li>● Thrombophilia screen</li> <li>● Clotting screen</li> <li>● FBC</li> <li>● Kleihauer</li> </ul>	Haematology
<ul style="list-style-type: none"> <li>● Cardioliipin antibodies</li> </ul>	Immunology

- For women who have experienced late pregnancy loss, stillbirth or neonatal death, carry out complete local list of blood tests and swabs
- Where pregnancy was medically terminated owing to fetal anomaly, investigations should include at least:
  - FBC
  - group and save
  - swabs (as per local guidance)

**CERTIFICATION**

- Failure to complete all certification carefully can result in delay registering baby
- Complete stillbirth and neonatal death certificates in black ink
- Print name after signatures and include GMC/PIN number
- Do not use abbreviations

**Miscarriage**

- For a baby born <24 weeks' gestation showing no signs of life, midwife or doctor present at birth completes local form to allow disposal of fetal remains
- If used locally, offer non-statutory certificate to the parents to acknowledge the death of the baby

**Stillbirth**

- Doctor or midwife present at birth completes a medical certificate of stillbirth
- A midwife or doctor who has examined the baby after birth can also complete the form but must be certain that the baby was not born alive

**Neonatal death**

- If baby was born alive, regardless of gestation, a medical certificate for the cause of death in baby dying within the first 28 days of life must be issued
- Medical certificates can **only** be completed by a doctor, neonatologist or obstetrician
- Doctor **must** have seen the baby alive but does not have to have seen the baby after death

**Babies born outside hospital without a midwife or doctor present**

- Where it is known that intrauterine death occurred before delivery, midwife or doctor examining baby can issue a stillbirth certificate. If there is any doubt, refer to the coroner
- If baby is born alive outside the hospital but has died before arrival at hospital, the coroner must be informed, regardless of gestation
- If parents request a cremation, midwife/doctor to complete a cremation certificate

**REGISTRATION**

- Give family information about how to register their baby. Ensure they have all the required certificates
- There is no legal requirement to register a baby delivered <24 weeks' gestation that shows no signs of life. However, a baby that shows signs of life, whatever gestation, must be registered as a **neonatal death**
- A stillborn child is defined in the Births and Deaths Registration Act 1953 (and amended by Stillbirths Definition Act 1992) as 'any child expelled or issued forth from its mother after the 24<sup>th</sup> week of pregnancy that did not breathe or show any signs of life', and should be registered as a **stillbirth**

**Clarification**

- Department of Health and Office for National Statistics have agreed the following under the above Act that:
  - if a fetus (or more than one fetus) is expelled after 24 weeks of pregnancy, then, provided it was no longer alive at the 24<sup>th</sup> week, (this fact being known or provable from the stage of development of the dead fetus) it does not fall within the category of births to be registered as stillbirth(s) under the above Act
- Royal College of Obstetricians and Gynaecologists and Royal College of Midwives have agreed: In a number of situations where it is known that one or more fetuses have died before the 24<sup>th</sup> week of pregnancy, those fetuses do not have to be registered as stillbirths. For example:
  - where there has been a delay between diagnosed intrauterine death and delivery
  - vanishing twins or selective or multifetal pregnancy reduction in multiple pregnancies
  - fetus papyraceous
- In all cases there must be evidence that it was known that the fetus or fetuses had died before the 24<sup>th</sup> week of pregnancy. This evidence, usually based on ultrasound imaging, must be clearly detailed in maternal healthcare record for future reference
- Occasionally there is no ultrasound evidence available when ≥1 fetus is born dead >24 weeks' gestation. It may be appropriate to use stage of development of the fetus(es) as an indicator of when death occurred relative to the 24<sup>th</sup> week limit. This must be determined on a case by case basis by an obstetrician of at least middle grade (ST3-7 or equivalent e.g. staff grade, clinical fellow) – it is not the responsibility of the attending midwife
- Where there is any doubt about when the fetus or fetuses have died, register as a stillbirth

### FOLLOW-UP

- Give parents adequate time to discuss issues and ask questions before discharge. They may wish to speak to the midwife looking after them, obstetric staff or specialist midwife for bereavement services
- Give parents information and support contact numbers before discharge
- Arrange follow-up appointment with named obstetric consultant. In some circumstances and with the agreement of all parties, it may be more appropriate to arrange an appointment with the consultant who has been involved in mother's care while in hospital
- Complete all discharge paperwork carefully and completely

### In the community

- After discharge, the majority of parents whose baby has died will require care and support in the community
- Specialist midwife for bereavement services may (in conjunction with community midwife/GP where appropriate) visit parents at home and offer a telephone call
- GP and community midwife will be informed of delivery. When delivery has occurred <24 weeks, woman may choose not to have a community midwife visit; ≥24 weeks, there is a statutory requirement for community midwife to visit

**INTRODUCTION**

- Perineal trauma may occur spontaneously during vaginal birth or by a surgical incision (episiotomy). It is possible to have an episiotomy and a spontaneous tear (for example, an episiotomy may extend into a third degree tear)
- >85% of women who have a vaginal birth will sustain some degree of perineal trauma and of these 60–70% experience suturing

**DEFINITION**

**Anterior perineal trauma**

Injury to labia, anterior vagina, urethra or clitoris

**Posterior perineal trauma**

Injury to posterior vaginal wall, perineal muscles or anal sphincters – may include disruption of the anal epithelium

**Classification of perineal tears**

Midwife/doctor must identify the extent of perineal trauma and document it according to the agreed classification

**Definition of spontaneous tears**

First degree	Second degree	Obstetric anal sphincter injury
<ul style="list-style-type: none"> <li>● Injury to skin only</li> </ul>	<ul style="list-style-type: none"> <li>● Injury to perineum involving perineal muscles but not involving anal sphincter</li> </ul>	<ul style="list-style-type: none"> <li>● Injury to perineum involving anal sphincter complex                             <ul style="list-style-type: none"> <li>● 3a: &lt;50% of external anal sphincter (EAS) thickness torn</li> <li>● 3b: &gt;50% of EAS thickness torn</li> <li>● 3c: EAS and internal anal sphincter (IAS) torn</li> </ul> </li> </ul> <p>See also <b>Third and fourth degree perineal tears - OASIS guideline</b></p>

**PRINCIPLES OF REPAIR**

- All women receive a systematic assessment of the perineum, vagina and rectum and an accurate evaluation of any trauma sustained
- Give clear information regarding the extent of perineal trauma sustained, and how and when to seek advice if problems occur

**Systematic assessment**

- Further explain what is planned and why
- Timing of systematic assessment should not interfere with mother-infant bonding unless bleeding requires urgent attention
- Follow local guidance for invasive procedures to minimise the risk of an unintentionally retained foreign body
- check equipment and count swabs, tampon (if used) and needles before commencing procedure and count again following completion of repair
- Lithotomy is the usual position to allow adequate visual assessment of the trauma and for the repair. If the tear is easy to visualise and does not require prolonged suturing lithotomy is not required. Maintain lithotomy only as long as necessary for assessment and repair

**Initial assessment**

- Explain what is planned and why
- Offer entonox
- Ensure good lighting
- Position woman comfortably with genital structures clearly visible
- Perform initial examination gently and with sensitivity soon after birth
- if genital trauma identified, carry out further systematic assessment including a rectal examination

- Confirm effective local or regional analgesia in place.  $\leq 20$  mL lidocaine 1% can be used
- Assess trauma visually (with good lighting) including structures involved, apex of injury and degree of bleeding
- Perform rectal examination to identify damage to the external or internal anal sphincter

## Documentation

- Clearly document in maternal healthcare record:
- examination findings, using agreed classification above, consider using a diagram
- if rectal examination performed as part of initial assessment
- if rectal examination was **not** carried out and reasons for not doing so

## Perineal suturing

### Consent

- Explain procedure, obtain and record consent
- Women who refuse to be examined and/or decline perineal repair must be given the opportunity to discuss their concerns with the person providing care. Discussion should include information about the potential risks which may occur if trauma to the sphincters remains undetected
- ensure discussion is clearly documented

### Equipment

- Suture pack with X-ray detectable gauze swabs
- Sterile gown and gloves
- Protective glasses
- Cleansing solution or sterile water
- Suture material – Vicryl Rapide™ 2–0 (or equivalent) on a 35 mm taper cut needle
- 10–20 mL syringe and green needle

- Obstetric cream
- Local anaesthetic – lidocaine 1%  $\leq 20$  mL. If more required, consider spinal anaesthetic
- Adequate lighting
- Drapes

## Procedure

- Complex trauma must be repaired by an experienced obstetrician in theatre under regional or general anaesthesia
- Suture as soon as possible following delivery to reduce blood loss and risk of infection, except in women who have laboured in the pool or had a water birth, in which case, suture after an hour
- Use an aseptic technique
- If woman reports inadequate pain relief, provide immediately
- Ensure good anatomical alignment of the wound and give consideration to the cosmetic result
- Use a continuous non-locked suturing technique for the vaginal wall and muscle
- If skin is opposed following muscle suturing it is not necessary to suture it
- Where skin does require suturing use a continuous subcuticular technique
- Suture first degree tears unless edges are well opposed
- On completion of repair, perform further rectal examination to exclude any suture material inserted through rectal mucosa
- Unless contraindicated, administer diclofenac (Voltarol®) 100 mg rectally

**Before and after suturing, perform and document a 2-person swab, tampon (if used), needle and instrument check. Be particularly vigilant if there is heavy bleeding, a change of operator or transfer to theatre**

- If a vaginal pack is left *in situ*, document and communicate via handover

- Ensure safe disposal of all equipment in accordance with local Trust policy and COSHH regulations
- Document nature of trauma, method of repair and swab, tampon, needle and instrument count
- Unless contraindicated, prescribe and administer pain relief
- Advise woman about extent of trauma, type of repair, pain relief, diet, hygiene and the importance of pelvic floor exercises

### **Problems with perineum after discharge from hospital**

- If GP or community midwife concerned about a woman's perineum they should refer her urgently to the maternity unit or to the perineal trauma clinic

# POSTPARTUM HAEMORRHAGE (PPH) • 1/6

## INTRODUCTION

Haemorrhage is a significant cause of direct maternal death. Obstetric haemorrhage can become life-threatening

## RECOGNITION AND ASSESSMENT

- Normal blood volume from 13/40 is approximately 100 mL/kg
- Acceptable blood loss at vaginal delivery is  $\leq 500$  mL
- Acceptable blood loss at caesarean section (CS) is  $\leq 1000$  mL

## Primary postpartum haemorrhage

- Excessive blood loss at or after delivery of fetus (see above for volumes) in first 24 hr
- Affects approximately 5% of all deliveries in the UK

## Secondary postpartum haemorrhage

- Excessive blood loss from genital tract  $> 24$  hr after birth  $\leq 12$  weeks of delivery

## Blood loss

### Definition

- Loss of  $\geq 500$  mL of blood from genital tract  $\leq 24$  hr of birth of baby
- **Minor:** 500–1000 mL
- **Moderate:**  $> 1000$ –2000 mL
- **Severe:**  $> 2000$  mL

### Early signs haemorrhage (loss of 1000–1500 mL)

- Tachycardia
- Increased respiratory rate
- Slight fall in systolic blood pressure

### Late signs haemorrhage (loss of $> 1500$ mL)

- Decreased blood pressure
- Worsening:
  - tachycardia
  - tachypnoea
- Altered mental state

**Be aware that visual assessment of blood loss is inaccurate; include signs and symptoms in assessment**

## PREVENTION

Table 1: Cause of haemorrhage (the 4 T's)

4 T's	Specific cause	Relative frequency
<b>A – Tone</b>	<ul style="list-style-type: none"> <li>● Atonic uterus, multiple pregnancy, previous PPH, fetal macrosomia, delayed second stage, prolonged third stage, general anaesthesia</li> </ul>	70%
<b>B – Trauma</b>	<ul style="list-style-type: none"> <li>● Cervical, vaginal or perineal lacerations</li> <li>● Pelvic haematoma</li> <li>● Inverted uterus</li> <li>● Uterine rupture</li> </ul>	20%
<b>C – Tissue</b>	<ul style="list-style-type: none"> <li>● Retained tissue</li> <li>● Invasive placenta (accreta)</li> </ul>	10%
<b>D – Thrombin</b>	<ul style="list-style-type: none"> <li>● Coagulopathies e.g. PET</li> </ul>	1%

### Prevention is better than cure

- Women at increased risk of bleeding, active management of third stage advised
- Give Syntometrine® 1 mL (ergometrine 500 micrograms + oxytocin 5 units) IM or oxytocin 10 units IM (unlicensed) or 5 units by slow IV bolus in third stage
- If increased risk of PPH at CS, consider tranexamic acid 0.5–1 g slow IV at maximum rate of 100 mg/min, in addition to oxytocin

### IMMEDIATE MANAGEMENT (ALL PPH)

- **Summon help** – middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant, anaesthetist, senior midwife and ancillary staff if necessary
- Keep woman warm
- Communicate clearly to woman and her birth companion(s)
- Obtain **venous access** – insert large bore 14 or 16 gauge cannula and take **bloods** for FBC, clotting screen, group and save and crossmatch if required
- Commence **crystalloid fluids**, ideally warmed
- **Palpate uterus** for atony and commence fundal massage. Consider bimanual compression
- **If woman did not receive Syntometrine® for management of third stage** and has not been hypertensive, and has had BP checked since admission, give ergometrine 500 microgram IM
- If required, give an antiemetic
- **Empty bladder** to assist with uterine contraction
- **Commence oxytocin** infusion using local regimen for postpartum
- **Monitor** pulse, respiratory rate and blood pressure every 15 min initially
- **Document** fluid balance

### MASSIVE OBSTETRIC HAEMORRHAGE

- Simultaneously perform resuscitation, monitoring, arresting bleeding and communication
- Manage as for **all PPH** above, in addition:
- In first instance – follow management as above
- **Summon help:**
  - middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
  - anaesthetist
  - senior midwives (e.g. midwife co-ordinator and another experienced midwife)
  - other personnel (e.g. porter/auxiliary/HCA to run errands etc.)
- **Consider:**
  - **A – AIRWAY** – check airway not compromised
  - **B – BREATHING** – oxygenate with 15 L/min oxygen via face mask
  - **C – CIRCULATION** (below)

### Bloods

- Cannulate (insert two 14 or 16 gauge venous cannulae – 1 in each arm) and take blood for:
  - FBC
  - APTT
  - PT (INR)
  - fibrinogen
  - crossmatch (≥4 units of packed red cells)
  - U&Es and LFTs
- Clotting is particularly important if the bleeding has been over a period of time

**Fluids and fluid balance**

- **Give fluids** – compound sodium lactate (Hartmann’s) solution 1 L stat
- Follow with blood, colloid or crystalloid as indicated by availability, blood loss and woman’s haemodynamic state
- Do not give >3.5 L clear fluids, ideally warmed [up to 2 L compound sodium lactate (Hartmann’s) solution and 1.5 L colloid] while waiting for blood
- Insert urinary catheter with hourly urinometer attached and maintain urine output >0.5 mL/kg/hr

**Blood transfusion**

- Use local trigger phrase for massive obstetric haemorrhage:
  - when requesting blood products from the biomedical scientist for haematology
  - when contacting porters
  - to communicate the urgency of the need for blood products

- Transfuse crossmatched packed cells as soon as possible if required
- Use best available device to deliver warmed fluids rapidly
- do not use blood filter
- In a dire emergency while awaiting crossmatched blood, consider requesting type specific blood or O negative blood
- If red cell antibodies present, liaise closely with blood bank
- Fresh frozen plasma (FFP) usually required if 4 units of packed red cells are given
- Refer to Trust **Massive haemorrhage** guideline

**Table 2: Blood product replacement**

<b>Blood product</b>	<b>Indication</b>
<b>Tranexamic acid IV</b>	● 20 mg/kg (max rate 100 mg/min)
<b>Packed red cells</b>	● Give fully crossmatched blood if possible. If insufficient time, give type specific and, only as an absolute necessity, give O negative blood
<b>Fresh frozen plasma (FFP)</b>	<ul style="list-style-type: none"> <li>● Avoid dilutional coagulopathy by early and adequate use of FFP (and other blood products as required)</li> <li>● Give 4 units for every 6 units of red cells</li> <li>● Give early where coagulopathy suspected e.g. abruption, amniotic fluid embolus, delayed diagnosis PPH</li> <li>● Aim to maintain PT and APTT at &lt;1.5 x normal</li> </ul>
<b>Platelets</b>	● Give when count <75 x 10 <sup>9</sup> /L or on consultant haematologist advice
<b>Cryoprecipitate</b>	● Keep fibrinogen >2 g/L

## Oxygen

- 15 L/min oxygen via face mask initially, with woman lying flat

## Monitoring

- Attach non-invasive blood pressure cuff
- Monitor every 15 min and record on MEOWS or HDU chart; act on promptly when there is deterioration in parameters
- BP
- pulse
- SpO<sub>2</sub> (maintain at >95%)
- respiratory rate
- urine output and fluid balance
- core temperature

## Inform

***For massive obstetric haemorrhage, use local trigger phrase to communicate the seriousness of the situation clearly***

- Consultant obstetrician (who will usually attend as soon as possible)
- Consultant anaesthetist
- Theatre team (even if not immediately going to theatre)
- Haematology biomedical scientist to allow them to prepare for major haemorrhage
- Haematologist if:
  - blood products other than 4 units of packed cells and 4 units of FFP are required, or
  - if there is ongoing haemorrhage after this has been given or
  - if clotting studies are abnormal
- Consider involving surgical colleagues as required

## Specific treatment

- For causes of haemorrhage (4 T's) including surgery – see **Tone (uterine atony), Trauma, Tissue and Thrombin** below
- commonest cause is uterine atony

- If surgery to be carried out for major PPH, it is usual to obtain consent for hysterectomy
- Involve consultant with greater gynaecological surgical experience in complex cases. If available locally, consider contacting interventional radiologist

## Repeat blood tests

- FBC
- APTT, PT (INR), fibrinogen
- Ca<sup>2+</sup>
- Blood gases including lactate

## Reassess

- State of haemorrhage and woman's physiological state after initial resuscitation

## Central venous and arterial lines

- If continuing haemorrhage (or haemorrhage >40 mL/kg), or need to go to theatre for second time, insert CVC and arterial lines (and monitor CVP and BP directly)
- Use early if cardiovascular system compromised by disease

## Hypocalcaemia

- Suspect if massive (>10 units blood) transfusion with ongoing hypotension, check Ca<sup>2+</sup>. Give calcium gluconate 10% 10–20 mL by IV infusion over 10 min. Ensure ECG monitoring when administering calcium gluconate

## Support for woman and family

- Ideally, midwife should remain with woman and family throughout the emergency situation

**POST-EVENT**

- As soon as practically possible after a massive haemorrhage, consultant obstetrician should counsel woman and her family providing explanation and significance of cause of haemorrhage

**Thromboprophylaxis**

- These women are at increased risk of thromboembolism, whilst being nursed in HDU, consider thromboembolic stockings and other methods of mechanical thromboprophylaxis
- Unless advised to be inappropriate by consultant obstetrician/anaesthetist, give LMWH regardless of mode of delivery once bleeding has settled

**Non steroidal anti-inflammatory drugs**

- Contraindicated for  $\leq 12$  hr after haemorrhage has settled and platelet count and renal function are normal

**Documentation**

- Carefully document:
  - times
  - drugs, fluids and blood products administered
  - personnel
  - use of trigger phrase
- Complete incident forms as required

**A TONE (UTERINE ATONY)**

**Immediate management**

- Fundal massage, empty bladder and consider bimanual uterine massage
- **Oxytocin** – start oxytocin infusion. Use local regimen for postpartum via volumetric pump
- Remember to inspect vulva, vagina and cervix for trauma/lacerations
- Consider:
  - a first or repeat dose of oxytocin 5 or 10 units slow bolus IV or 10 units IM (unlicensed)

- ergometrine 250 microgram IM with an antiemetic [contraindicated in pregnancy induced hypertension (PIH) or other significant cardiovascular disease]
- carboprost (Hemabate®) 250 microgram IM or intramyometrially (unlicensed)
  - repeated up to every 15 min to maximum of 2 mg (unusual to reach maximum dose)
- misoprostol 800 microgram sublingually or 1 mg PR, if used locally

**Continuing bleeding**

- If above measures fail to prevent ongoing or recurrent bleeding, suspect **Trauma, Tissue** (e.g. retained products of conception) or **Thrombin** (e.g. a coagulopathy)
- If pharmacological measures fail to control bleeding, initiate surgery sooner rather than later
- Consider surgical examination under anaesthesia
  - if woman haemodynamically stable, use pre-existent regional (epidural) anaesthesia
  - if woman not stable or (dilutional) coagulopathy present, use general anaesthesia
- If bleeding still not controlled, consider uterine cavity balloon tamponade, haemostatic brace suture, hysterectomy, uterine artery ligation/embolisation by an interventional radiologist
- A consultant obstetrician must be involved
- A second consultant opinion before hysterectomy can be helpful, but hysterectomy should be performed sooner rather than later

**B TRAUMA**

**Inverted uterus**

- Degree of haemodynamic shock is often disproportionate to the volume of the haemorrhage

- **Replace uterus as soon as possible** using manual, hydrostatic or surgical methods
- Anticipate massive haemorrhage
- Some women may experience a vasovagal episode (hypotension and bradycardia) during uterine replacement
- Run an oxytocin infusion using local regimen for postpartum for  $\geq 4$  hr after replacement

### Uterine rupture

- See **Uterine rupture** guideline

### Perineal trauma

- See **Third and fourth degree perineal tears – OASIS** guideline and **Perineal trauma suturing (tears and episiotomy)** guideline

### Other

- Broad ligament haematoma
- Extra genital bleeding e.g. sub capsular liver rupture

## C TISSUE

### Retained placenta

- See **Retained placenta** guideline

### Placenta accreta/increta/percreta

- See **Morbidly adherent placenta** guideline
- If attempts are made to separate adherent placenta (surgically/forcibly), expect massive haemorrhage
- If expected or actual haemorrhage, follow management plan for major obstetric haemorrhage
- 1 option, after consultant review, is to leave the placenta *in situ* and monitor woman very closely for signs of infection and bleeding in postnatal period

## D THROMBIN

### Inherited coagulopathies

- Several inherited conditions will give rise to excessive peripartum haemorrhage if incorrectly managed and not detected antenatally.  
**Seek advice from consultant haematologist at earliest opportunity** (ideally antenatally) about the investigation and treatment of these varied and uncommon conditions

### Acquired coagulopathies

- Will often represent a form of **Disseminated Intravascular Coagulation (DIC)** and will usually result in continuing or worsening haemorrhage without blood product replacement therapy
- Suspect DIC in abruption, severe PIH, prolonged +/- infected retained fetus/products of conception, amniotic fluid embolism or prolonged/untreated hypovolaemic shock
- FBC, PT, INR, APTT, and APTR in the first instance in all those conditions where there is a known associated complication of DIC
- If platelet count  $< 50 \times 10^9/L$  or INR  $> 1.6$ , check fibrinogen and fibrinogen degradation products (FDP) levels
- Give FFP, platelets, +/- cryoprecipitate as directed by investigations
- Seek advice of consultant haematologist about treatment and further investigations

# PREGNANT WOMAN WITH A NON-OBSTETRIC PROBLEM (MANAGEMENT OF) • 1/1

## INTRODUCTION

- Assessment and management of disease unrelated to the pregnancy are altered by the pregnancy
- The need to consider 2 patients (mother plus fetus) may change treatment decisions
- Anatomical and physiological changes in pregnancy result in altered:
  - clinical features during CVS and respiratory system and abdominal examination
  - biochemical and haematological values
  - pharmacological management
  - response to any systemic pathology
  - protocols for the management of critical illness

## AIM

- To ensure
  - every pregnant woman admitted is managed promptly
  - communication link is established between admitting team and obstetric team so that the most appropriate care can be delivered

## ACTIONS

### Accident and emergency

- Ask apparently pregnant woman presenting to Emergency department for any reason (irrelevant of gestation) if she has booked for maternity care
  - if not booked for maternity care, inform delivery suite co-ordinator, who can advise on appropriate follow-up and booking arrangements
- In cases of trauma or vaginal bleeding at any gestation, give consideration to woman's blood group and need for anti-D. If in doubt, discuss with on-call middle grade obstetrician (ST3-7 or equivalent e.g. staff grade, clinical fellow)

### Nursing

- To prevent aortocaval compression, do not nurse women in the second and third trimester in supine position

- If the disease causes reduced mobility, consider VTE prophylaxis. Use local obstetric VTE assessment tool
- Use early warning scoring system (MEWS) to help in the timely recognition, treatment and referral of women who have or are developing critical conditions

## Contact

- If  $\geq 16$  weeks' gestation, contact delivery suite co-ordinator, who will advise which healthcare professional(s) should review, if necessary after discussion with on-call obstetric middle grade obstetrician (ST3-7 or equivalent e.g. staff grade, clinical fellow)
- If any severely ill pregnant woman is admitted outside the maternity service:
  - contact on-call middle grade obstetrician/consultant obstetrician
  - if she is critically ill, or likely to need urgent surgery, refer early to critical care team and/or anaesthetist
- By giving consideration to the pregnancy and the fetus, maternity service providers can help with:
  - assessment of maternal and fetal wellbeing
  - investigations
  - treatment
- Be aware of the significance of hypertension and proteinuria in pregnant women

***Radiological investigations are not contraindicated during pregnancy where there is a significant clinical indication. Discuss with obstetric team***

## Documentation

- Document all communication (including inter-departmental) in maternal healthcare record, highlighting pregnant or newly delivered woman's attendance or admission to non-midwifery ward or department

- Rupture of membranes before onset of labour  $\geq 37$  weeks' gestation
- majority of women will labour spontaneously within 24 hr of PROM
- PROM is associated with an increased risk of intrauterine infection

### RECOGNITION AND ASSESSMENT

#### History and examination

- Take a careful history
- Full antenatal assessment, including fetal and maternal observations and abdominal palpation to confirm fetal lie and presentation
- Assess fetal wellbeing
- Speculum examination and indicator swab test (if used locally), or pad test (if used locally) is only required if there is doubt about whether membranes have ruptured
- If contractions absent, do not perform digital vaginal examination, unless result necessary to guide or alter management
- Electronic fetal monitoring (EFM) 24 hr after PROM or earlier if other indications e.g. decreased fetal movement

#### Assessment and indications for immediate induction of labour (IOL)

- When forming management plan, determine if immediate IOL is necessary – see below
- consider duration of ruptured membranes

#### Risk factors for intrauterine infection

- Maternal group B *streptococcus* status
- Presence of meconium in amniotic fluid
- Increasing time from rupture
- Number of vaginal examinations
- Use of internal monitoring
- Length of labour and mode of delivery

#### Indications for immediate IOL

- Induce labour immediately if:
  - maternal pyrexia
  - fetal distress
  - significant meconium stained liquor
  - blood stained liquor
  - requiring group B *streptococcus* prophylaxis
  - HIV positive mother
  - unstable presenting part
  - maternal choice

### MANAGEMENT

*As time between rupture of membranes and onset of labour increases, so does the risk of maternal and fetal infection*

#### Expectant management

- Until IOL commenced or if woman chooses expectant management beyond 24 hr, care can be inpatient or outpatient
- Advise women that:
  - the risk of serious neonatal infection is 1%, rather than 0.5% for women with intact membranes
  - 60% of women with PROM will go into labour within 24 hr
  - IOL is appropriate approximately 24 hr after rupture of membranes
- If labour not started after 24 hr of ruptured membranes, arrange induction
- Until induction is started, or if expectant management beyond 24 hr is chosen by the woman:
  - assess fetal movement and heart rate at initial contact and then every 24 hr
  - do not offer lower vaginal swabs and measurement of maternal C-reactive protein

- Advise woman:
  - bathing or showering not contraindicated
  - to avoid sexual intercourse
  - to record her temperature 4-hrly during waking hours
  - to report immediately any change in:
    - the colour or smell of her vaginal loss
    - any change in fetal movement pattern
    - if labour begins
- If any fever or change in colour or odour of amniotic fluid, commence induction
- If labour has not started 24 hr after rupture of membranes, advise the woman to give birth where there is access to neonatal services, and to stay in hospital  $\geq 12$  hr after birth
- Provide woman with information leaflet before discharge home

## Evidence of infection in mother

- Prescribe broad spectrum antibiotics – as per local practice
- Babies born with symptoms of possible sepsis or to a woman with evidence of chorioamnionitis, immediate referral to neonatologist (see **Group B streptococcal disease** guideline)

## Induction and delivery

- For women with previous caesarean section (CS) – see **Induction of labour** guideline
- Discuss with woman and explain procedure
- Use either oxytocin or prostaglandin
- On admission, perform digital vaginal examination using aseptic technique
  - if cervix unfavourable, use prostaglandin (see **Induction of labour** guideline) – follow local practice
- If local practice, consider antibiotic prophylaxis
- After 24 hr from membrane rupture (if not already in established labour), perform EFM
- Perform EFM in labour

## POSTNATAL

- If delivery  $> 24$  hr following PROM, advise woman to remain in hospital with her baby  $\geq 12$  hr following delivery
- Advise woman with PROM to inform midwife/GP immediately if concerned about baby's wellbeing in first 5 days following delivery, particularly in first 24 hr when risk of infection is greatest

## Observations (baby)

- Closely observe any baby born to a woman with PROM ( $> 24$  hr before the onset of established labour) at term for the first 12 hr of life (at 1 hr, 2 hr, 6 hr and 12 hr) in all settings
- Perform Neonatal Early Warning Score observations
- Include assessment of following – if any abnormality or any of these are observed, request assessment by a neonatologist
  - temperature
  - heart rate
  - respiratory rate
  - presence of respiratory grunting
  - significant subcostal recession
  - presence of nasal flare
  - presence of central cyanosis, confirmed by pulse oximetry if available
  - skin perfusion assessed by capillary refill
  - floppiness, general wellbeing and feeding
- If there are no signs of infection in the woman – see **Sepsis** guideline, do not give antibiotics to either her or baby, even if membranes have been ruptured for over 24 hr
- If there is evidence of infection in the woman, prescribe a full course of broad-spectrum intravenous antibiotics to baby
- Refer baby with any symptom of possible sepsis, or born to woman with evidence of chorioamnionitis, to neonatal care specialist immediately

## INTRODUCTION

- Preterm birth is the most important single determinant of adverse infant outcome
- preterm defined as delivery before 37 completed weeks

## RISK FACTORS

- Previous preterm birth
- Infection/inflammation of genital tract
- Cervical weakness
- Uterine abnormality
- Substance abuse
- Multiple pregnancy
- Polyhydramnios
- Bleeding/thrombosis
- Early stress
- Low BMI
- Short conception cycle <1 yr
- Aged <17 and >35 yr

## DIAGNOSIS AND ASSESSMENT

- All women with suspected preterm labour/preterm ruptured membranes <34 weeks' gestation to be assessed by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant
- Any woman <29 weeks' gestation to be seen by consultant obstetrician within 24 hr of admission
- Confirm gestational age
- Take thorough history
- Record
  - maternal temperature
  - pulse
  - blood pressure
  - respiratory rate
  - MEOWS score
- Perform abdominal palpation to determine presentation
- if in doubt confirm using portable ultrasound machine

- Palpate for contractions
  - note strength and frequency/tenderness
- In all cases seek an underlying cause e.g. placental abruption, infection
- >26 weeks' gestation: perform CTG
- Perform speculum examination and 1 of the following:
  - fetal fibronectin test: avoid using gel with speculum – use only use sterile water (see below)
  - cervical length scanning: if cervical length is  $\leq 15$  mm, consider diagnosis of preterm labour and offer treatment
  - if extent of cervical dilatation cannot be assessed: digital vaginal examination
    - to be performed by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant only
    - only indicated if regular contractions are palpable
    - if pre-labour rupture of membranes has occurred avoid digital vaginal examination
- Explain to woman: clinical assessment, available diagnostic tests, and how these will be carried out

## Test for preterm labour

- Follow manufacturer's instructions
- Only valid 23–35 weeks' gestation
- To reduce the risk of false positive results use only water as lubricant for speculum examination
- Take swab from posterior fornix before any other vaginal/cervical swab or digital examination
- Not indicated if evidence of membrane rupture
- Do not use test if moderate/gross bleeding, or in women with suspected placenta praevia or abruption
- If sexual intercourse has occurred in the previous 24 hr, may be difficult to interpret
- Record result in hospital maternity care record

**Quantitative fibronectin results (if available locally)**

<b>FFN value ng/mL</b>	<b>% who will deliver within 2 weeks</b>	<b>% who will deliver &lt;34/40 weeks</b>	<b>Suggested management</b>
0–9	<2	<2	● Home routine follow-up
10–49		5–15	● Home routine follow-up
50–199	5–15	10–15	● Admit ● Betamethasone ● Consultant-led care
200–499	30	30	● Admit ● Betamethasone with tocolysis ● MgSO <sub>4</sub> if <30/40 ● Consultant-led care ● Consider repeat FFN in ANC
≥500	50	75	● Admit ● Betamethasone with tocolysis ● MgSO <sub>4</sub> if <30/40 ● Consultant-led care

**Diagnosing preterm pre-labour rupture of membranes (P-PROM)**

- See **Diagnosis and assessment** above
- Offer a sterile speculum examination to look for pooling of amniotic fluid – use water only as lubricant
- Avoid digital examination
- HVS and endocervical swab for chlamydia
- if pooling of amniotic fluid observed, do not perform diagnostic test and offer management of P-PROM
- if pooling of amniotic fluid not observed, consider performing diagnostic test for ruptured membranes, if used locally
- Follow manufacturers’ advice carefully
- Do not perform diagnostic tests for P-PROM if woman is in labour
- If results of test for P-PROM are negative and no amniotic fluid is observed:
  - do not offer antenatal prophylactic antibiotics
  - explain to the woman that P-PROM is unlikely, but advise to return if there are any symptoms suggestive of P-PROM or preterm labour

- If the results of test for P-PROM are positive, take into account clinical condition, medical and pregnancy history, and gestational age, then:
  - offer management of P-PROM or
  - re-assess in next 24 hr for clinical evidence of P-PROM

**MANAGEMENT OF P-PROM**

- Assess risk of cord prolapse
- Admit unless reason to deliver
- If discharged arrange follow-up to investigate for infection (see below), and advise to return if signs of labour or infection

**Antibiotics**

- Oral erythromycin 250 mg 6-hrly for maximum of 10 days, or until labour is established
- if woman is in labour, do not offer erythromycin
- women with P-PROM who cannot tolerate/contraindicated – consider oral penicillin
- Do not offer women with P-PROM co-amoxiclav as prophylaxis for intrauterine infection

### Follow-up

- Use the following in combination to diagnose intrauterine infection in women with P-PROM:
  - clinical assessment
  - blood test (C-reactive protein, WBC)
  - CTG
  - do not use any of these alone for follow-up
  - if results not consistent with each other, consider repeating

### Management 34<sup>+1</sup>–36 weeks

- Discuss with consultant
- Take into account other risk factors and clinical assessment when considering conservative management/induction of labour
- >36 weeks offer induction of labour

### MANAGEMENT OF PRETERM LABOUR 24–33<sup>+6</sup> WEEKS

- <26 weeks' gestation – see **Extreme prematurity (<28 weeks' gestation)** guideline
- Woman reporting symptoms of preterm labour with intact membranes – explain:
  - availability of neonatal cots and possible transfer if none available
  - benefits, risks and possible consequences of clinical assessment and diagnostic tests, including consequences of false positive and false negative results, taking into account gestational age
  - prognosis for baby, including survival and long-term outcomes (use '1 in 10' rather than '10%')
- Middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant to discuss with the woman and her birth partner(s) what to expect immediately, including resuscitation, and in the longer term for the baby
- If appropriate, offer visit to neonatal unit
- If cervical suture *in-situ*, discuss removal with consultant obstetrician

- Check availability of neonatal cots – follow local procedure

### Antenatal steroids

- Antenatal steroids reduce neonatal deaths within the first 24 hr
- Administer 2 doses of betamethasone 12 mg IM 12 hr apart, to promote fetal lung maturity
  - give even if delivery is expected within 24 hr
  - consider from 34–35<sup>+6</sup> weeks or, if pre-labour caesarean section (CS) is planned <38<sup>+6</sup> weeks' gestation
- Discuss benefits and maternal and fetal risks with woman
- Betamethasone: discuss with consultant obstetrician if:
  - signs of infection
  - woman is diabetic (see **Diabetes in labour** guideline)
  - steroids have already been given earlier in pregnancy
  - if risk of neonatal respiratory distress syndrome felt to outweigh the uncertainty about possible long-term effects, consider second course of antenatal steroids (especially if first course was given <26 weeks' gestation)
  - between 23<sup>+0</sup> and 23<sup>+6</sup> weeks

### Magnesium sulphate

- Protects premature babies' brains from cerebral palsy
- Administer to all women considered likely to deliver in  $\leq 24$  hr who are <30 weeks' gestation, regardless of mode of delivery
- Can be given to women with a multiple pregnancy, irrespective of whether steroids have been given
- Consider giving  $\leq 33^{+6}$  weeks' gestation if woman in established preterm labour, or having planned delivery in  $\leq 24$  hr
- Ideally commence infusion 4 hr before delivery
  - may still be of benefit if given <4 hr before delivery

## PRETERM LABOUR • 4/6

- Do not delay delivery in time critical situations e.g. fetal distress
- Administration may be impractical when delivery imminent
- Inform woman about possible side-effects:
  - facial flushing
  - nausea and vomiting
  - sweating
  - tachycardia
  - hypotension
  - effect may be more pronounced when given with calcium channel blockers e.g. nifedipine
- Loading dose of 4 g (8 mL) IV over 20 min
  - mix magnesium sulphate 50% 4 g (8 mL) with sodium chloride 0.9% 12 mL (total 20 mL)
  - set syringe driver at 60 mL/hr
  - dose administered over 20 min
- Administer maintenance dose of magnesium sulphate 1 g/hr IV via syringe pump until delivery, or for 24 hr, whichever is sooner
  - mix magnesium sulphate 50% 5 g (10 mL) with sodium chloride 0.9% 40 mL (total of 50 mL)
  - set syringe driver to 10 mL/hr
  - dose administered at 1 g/hr
- Commence hourly observations of:
  - heart rate
  - blood pressure
  - respiratory rate
  - level of consciousness
- Check deep tendon reflexes at least on every obstetric ward round, and once in the middle of the night
  - use patella tendon reflexes
  - use reflexes at elbow or wrist in women who have a working epidural
  - check reflexes more often when:
    - there is oliguria
    - woman taking nifedipine
    - dose of magnesium has required adjustment
- Monitor oxygen saturation continuously with pulse oximeter
- Stop infusion immediately and call middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) if:
  - tendon reflexes are absent
  - respirations <12/min
  - SaO<sub>2</sub> <96%
  - abnormal conscious level
  - urine output <1.5 mL/kg over 4 hr
- Antidote: calcium gluconate 1 g (10 mL 10% solution) IV over 3 min
- Repeat dose can be given later in pregnancy if woman did not deliver as expected
- Discontinue 30 min before anaesthesia, as can prevent fasciculations with suxamethonium, prolong the action of other muscle relaxants and promote hypotension

### Tocolysis

- Use if cervix ≤4 cm dilated, and either membranes are ruptured/vaginal fibronectin is positive
- Contraindications:
  - antepartum haemorrhage
  - suspicion of intrauterine sepsis
- Site IV line and run crystalloid solution in case of sudden change in blood pressure
- Take the following factors into account when making decision to start tocolysis:
  - other clinical features (e.g. bleeding or infection), may suggest stopping labour is contraindicated
  - gestational age
  - likely benefits of maternal corticosteroids
  - availability of neonatal care (need for transfer to another unit)
  - woman's preference
- Offer nifedipine as first line for tocolysis
  - if contraindicated, offer oxytocin receptor antagonists (atosiban)
- Avoid using multiple tocolytics as higher risk of adverse events
- If labour progresses, stop tocolysis

### Nifedipine regimen

- Contraindications:
  - aortic stenosis
  - heart failure
  - porphyria
  - severe hypotension
- Initial treatment: nifedipine 2 x 10 mg immediate release capsule (do not crush)
- Observations:
  - BP every 15 min for first 2 hr after first dose (should not cause drop in blood pressure in normotensive women)
  - monitor baby with CTG for the first 2 hr
- Subsequent treatment up to 72 hr: nifedipine retard (tablet) 10–20 mg 8-hrly, adjusted according to uterine activity

### Atosiban regimen – 2<sup>nd</sup> line

#### Initial treatment

- Bolus dose of 6.75 mg over 1 min
- ready prepared as 0.9 mL IV injection containing 6.75 mg
- can be diluted with sodium chloride 0.9% for infusion > 1 min

#### Subsequent treatment (up to 48 hr – via infusion pump)

- Dilute 2 x 5 mL vials (37.5 mg/5 mL) in of sodium chloride 0.9% 90 mL (solution of 0.75 mg/mL)
- Infusion of 18 mg/hr for 3 hr (24 mL/hr for 3 hr)
- then infusion of 6 mg/hr for maximum of 45 hr (8 mL/hr for maximum of 45 hr)
- Decision to stop atosiban to be made by middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant
- Stop after 12 hr without significant contractions (may be appropriate to stop earlier)
  - maximum duration of therapy: 48 hr
  - maximum dose: 330 mg
- Observations and cautions:
  - monitor BP and pulse hourly
  - continuous electronic fetal monitoring

dependent on gestation

- monitor blood loss after delivery
- Use with caution in presence of:
  - intrauterine growth retardation
  - known hepatic impairment
  - known renal impairment

### Emergency cervical suture

- Consultant obstetrician decision
- Do not offer 'rescue' cervical cerclage to women with:
  - signs of infection
  - active vaginal bleeding
  - uterine contractions
- After consultant review, consider 'rescue' cervical cerclage for women 16<sup>+0</sup>–27<sup>+6</sup> weeks, with dilated cervix and exposed, un-ruptured fetal membranes
  - take into account gestational age

### LABOUR

- Decide mode of delivery on individual basis
- If presentation not cephalic, delivery will generally be by CS once labour is confirmed
- See **Extreme prematurity (<28 weeks' gestation)** guideline
- Explain benefits and risk of CS specific to gestational age
- Highlight the difficulties associated with CS for a preterm birth, especially increased likelihood of a vertical uterine incision, and implications for future pregnancies
- No evidence that routine episiotomy prevents intracranial haemorrhage
  - may be indicated to prevent delay in second stage of labour
- If delivery needs to be accelerated – Ventouse contraindicated <34 weeks' gestation
- <32 weeks' gestation: middle grade neonatologist (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant to attend delivery (along with junior member of neonatal medical team)

- Premature babies are vulnerable to hypothermia – delivery room/theatre to be warm (windows shut, fans turned off) and Resuscitaire® heater turned on well before delivery
- <30 weeks' gestation: place baby in polythene bag (without drying) ensure hat to cover head
- If both mother and baby are stable, delay cord clamping for  $\geq 30$  sec, but <3 min, with baby held below mother to promote placenta-fetal transfusion
- If a preterm baby needs to be moved away for resuscitation, or there is significant maternal bleeding:
  - milk cord
  - clamp cord as soon as possible
- Obtain paired cord blood samples for blood gas analysis and inform neonatal unit of results

### Fetal heart rate (FHR) monitoring

- See **Extreme prematurity (<28 weeks' gestation)** guideline
- Offer women in established preterm labour but with no other risk factors either:
  - continuous cardiotocography or
  - intermittent auscultation
- Explain to the woman that there is an absence of evidence that using cardiotocography improves outcomes of preterm labour for the woman or baby, compared with intermittent auscultation

### Fetal scalp electrode and fetal blood sampling

- Do not use a fetal scalp electrode for FHR monitoring if the woman is <34<sup>+0</sup> weeks' gestation, except when:
  - it has been discussed with consultant obstetrician
  - it is not possible to monitor the FHR using either external cardiotocography or intermittent auscultation
- benefits are likely to outweigh potential risks

- Consider carefully 34–36 weeks' gestation
- <34<sup>+0</sup> weeks' gestation: do not carry out fetal blood sampling

### Group B streptococcus (GBS)

- Prematurity is an intrapartum risk factor for early onset GBS
  - if no other risk factors for early onset GBS, discuss antibiotic treatment in labour with neonatologist
  - if there is P-PROM of any duration and woman starts active preterm labour, consider intrapartum antibiotics for GBS prophylaxis
- Women who have had P-PROM may have been commenced on erythromycin
- If woman is pyrexial, erythromycin or GBS prophylaxis are not adequate to cover Gram negative and anaerobic infections
  - administer antibiotics to cover Gram positive, Gram negative and anaerobic organisms, e.g. cefuroxime and metronidazole

### PREVENTION OF PRETERM LABOUR

- After discussion with consultant obstetrician:
  - offer prophylactic vaginal progesterone or prophylactic cervical cerclage to women with history of spontaneous preterm birth or mid-trimester loss 16<sup>+0</sup>–34<sup>+0</sup> weeks' gestation and cervical length <25 mm
  - offer vaginal progesterone to women with no history of spontaneous preterm birth or mid-trimester loss and cervical length of <25 mm
  - consider offering prophylactic cervical cerclage for women with cervical length <25 mm, and who have either:
    - had P-PROM in a previous pregnancy or
    - history of cervical trauma

### STAFFING

- Recovery staff (ODP, midwife or nurse) must be appropriately trained to the standard required for general recovery facilities and maintain their skills
- Observe all women on a one-to-one basis

### Equipment

- Ensure appropriate equipment is available in recovery room and meets Association of Anaesthetists of Great Britain and Ireland (AAGBI) requirements

### POST-ANAESTHETIC CARE

- Begins as soon as surgical procedure completed
- Woman must be physiologically stable on departure from operating theatre
- Anaesthetist must determine need for monitoring during transfer
- If GA, extubate in theatre
- Transfer woman to recovery room
- Anaesthetist formally hands over care to recovery room nurse, operating department practitioner (ODP) or appropriately trained midwife, but remains responsible for the woman and must be readily contactable
- Recovery room nurse, ODP or appropriately trained midwife must provide one-to-one care
- Woman remains in recovery room for ≥30 min or until discharge criteria met – see below
- Midwifery care is required
  - to assess fundal height and lochia
  - to commence skin-to-skin contact (if not already started in theatre) and offer help with first breast feed
- If woman conscious, birth partner can accompany her to recovery

### MONITORING AND DISCHARGE CRITERIA (RECOVERY ROOM)

#### Mother

- Monitor and record on local documentation
- For all women, monitor the following parameters ≥ 10 min, as a minimum:
  - heart rate
  - blood pressure
  - SpO<sub>2</sub>
  - respiratory rate
  - temperature once
- Other parameters that may need to be monitored and that must be assessed before discharge are listed in **Table** overleaf

#### Baby

- See **Care of the newborn at delivery** guideline
- If woman conscious and baby well, hand baby to her immediately. Encourage skin-to-skin

## RECOVERY • 2/3

MONITOR	DISCHARGE CRITERIA
<b>General</b>	
Temperature	36–37.5°C
Airway	Able to breath deeply and cough on command
Blood glucose – if appropriate	
Urinary output – amount and colour	Adequate and clear
<ul style="list-style-type: none"> <li>● IV infusion running:</li> <li>● type of fluid</li> <li>● rate of administration</li> </ul>	
<b>Respiratory status</b>	
SpO <sub>2</sub>	94–98% with room air or supplemental oxygen
Respiratory rate	10–20/min
<b>Cardiovascular status</b>	
Pulse rate	50–100 beats/min. No unexplained cardiac arrhythmias
Systolic blood pressure	Within 20% of pre-anaesthetic level
<b>Neurological status</b>	
Conscious state	Easily rousable and able to respond appropriately to questions
Motor status	<ul style="list-style-type: none"> <li>● Able to:</li> <li>● sustain head lift ≥5 sec</li> <li>● move limbs in a co-ordinated manner</li> <li>● signs of motor recovery</li> </ul>
<b>Post-surgical status</b>	
Surgical drainage	<ul style="list-style-type: none"> <li>● No active signs of blood loss from wound/ drainage sites/vagina</li> <li>● Acceptable fundal height</li> </ul>
<b>Pain control if opioids administered – 20 min observations</b>	
<ul style="list-style-type: none"> <li>● Pain assessment</li> <li>● Analgesia administered and documented</li> </ul>	Woman must be pain-free or acknowledge pain score ≤3 or mild
<b>Post-operative nausea and vomiting (PONV)</b>	
Document treatment for PONV and effectiveness, e.g. treatment sheet, healthcare record	Must be controlled before discharge to ward
<b>Personal hygiene</b>	
Check	Ensure woman clean, dry and comfortable

### DISCHARGE FROM RECOVERY

- If discharge criteria not achieved, keep woman in recovery room and inform anaesthetist who must review

### Unsuitable for transfer to postnatal ward

- May require further intensive observations on delivery suite following assessment by anaesthetist and middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- Frequency of observations will depend on woman's condition

### Documentation

- **Must be completed and accompany woman on discharge:**

- clinical notes
- nursing record, midwifery notes
- post anaesthetic care record
- operation notes
- anaesthetic record
- treatment sheet/drug chart
- fluid infusion chart

### CARE DURING 24 HR FOLLOWING RECOVERY

- Use this guideline in conjunction with your local MEWS system

### On postnatal ward

- Close monitoring during first 24 hr. If available at your Trust, nurse in a 4-bedded room
- Intensity and frequency of observations will depend upon:
  - stage of recovery
  - nature of surgery
  - clinical condition of woman
  - type of analgesia [e.g. PCA i.e. intrathecal opioids (diamorphine)]

### Observations on ward

- On admission, perform initial assessment:
  - BP
  - pulse
  - oxygen saturation levels
  - respiratory rate
  - temperature
  - conscious level
- Assess the following as appropriate:
  - surgical site and drains
  - vaginal loss
  - palpate uterine fundus
  - catheter bag drainage – urine output
  - IV infusions
  - pain and sedation levels
  - nausea and vomiting

## GENERAL PRINCIPLES

### Consent

- Transfusion against a woman's expressed view is a gross physical violation – follow your local Trust **Consent** policy

### Mentally competent women

#### *Aged ≥18 yr*

- Have a fundamental legal and ethical right to refuse treatment (including blood transfusions) even if it is likely that refusal will result in their death
- No other person is legally able to consent to treatment for that adult or to refuse treatment on their behalf
- Administration of blood or blood products to a competent adult without consent or against their wishes is unlawful and ethically unacceptable and may lead to criminal, civil or disciplinary proceedings
- Women may refuse blood transfusions for many reasons, including:
  - religion
  - safety concerns
  - previous transfusion reactions
  - previous negative experience

#### *Aged <18 yr*

- In law women aged 16–18 yr have the same capacity and right to consent to treatment as persons aged ≥18 yr. Case law has extended the right to persons aged <16 yr who are judged to have the capacity to fully understand what is proposed
- Where a woman aged <16 yr is believed to have the necessary capacity, her acceptance of treatment cannot be nullified by parental objection

- Where a woman aged <16 yr refuses blood products, seek urgent advice from Trust manager/director on-call. Consider second opinion from consultant obstetrician/anaesthetist/haematologist

### Unconscious/incapable woman

- If an unconscious or apparently incapable woman is admitted, treat in the normal way, except where:
  - there is compelling evidence that the person, if capable, would refuse to accept blood (e.g. carrying a card or document rejecting blood transfusion in all circumstances, especially if noted at booking). Her wishes must be respected provided the decision is clearly applicable to the present circumstances and there is no reason to believe she has changed her mind
  - Views of close relatives or friends could be taken into account but would not be decisive (General Medical Council 1998)
  - in cases of dispute, seek urgent advice from on-call consultant haematologist and Trust manager/director on-call

## AT BOOKING

### Discussion and documentation

- Ask all women if they have any objection to blood transfusion – document response
- Wherever possible, see woman on her own without outside influence
  - discuss risks of refusing blood e.g. may be life-threatening if massive haemorrhage
- Document conversation and woman's decision in maternal healthcare record
- If available at your Trust, give her a 'Receiving a blood transfusion' leaflet

### Refusal

- If woman does not wish to accept blood transfusions in any circumstances, ask her to complete an advance directive/decision to this effect. Place 1 copy in maternal healthcare record and the other in main case notes
- Complete a neonatal alert/maternal alert form and any other alert system used locally
- Refer her to consultant obstetrician and consultant anaesthetist

- If high blood loss during caesarean section anticipated (e.g. placenta praevia), discuss at multidisciplinary level and make appropriate arrangements e.g. cell salvage

### Reversal of decision

- If woman changes her decision in any way, complete a 'Reversal of advance decision' form (if available locally) and file in front of the Advance decision
- The maternal alert form will be updated to reflect this reversal of decision. All forms will remain in woman's healthcare record and will not be removed even if a reversal of advanced decision is made

### Investigations and preparation

- Check blood group, antibody status, haemoglobin and serum ferritin
- start ferrous sulphate and folate to be given throughout pregnancy to maximise iron store
- Ultrasound scan to identify placental site

### LABOUR

- When a woman refusing blood transfusion is admitted, follow individualised management plan and inform consultant obstetrician and consultant anaesthetist on-call
- Routine labour management, by experienced staff
- Consent obtained for active third stage of labour – see **Third stage of labour** guideline

### ANTENATAL

- Prepare a detailed birth management plan with woman
- She must be informed of services available e.g. cell salvage, haemodilution and interventional radiology
- Aggressively manage anaemia
  - in anaemia, consider erythropoietin after discussion with haematologist
- If unusual bleeding occurs at any time during pregnancy, advise woman to attend hospital for review by a middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow). If actively bleeding, on-call consultant obstetrician will be informed. Threshold for intervention will be lower than in any other woman
- Bleeding must be quantified as accurately as possible
- In the event of a significant haemorrhage, involve duty consultant anaesthetist and on-call consultant haematologist in management

### At delivery

- When baby delivered, give mother Syntometrine® 1 mL IM
- Do not leave mother alone for  $\geq 1$  hr following delivery
- Monitor lochia closely for  $\geq 1$  hr after delivery
- If increased risk of postpartum haemorrhage, oxytocin infusion as per local regimen. This will include women with:
  - history of bleeding (post or antenatal haemorrhage)
  - prolonged labour especially if augmented with oxytocin
  - maternal age  $>40$  yr
  - $\geq 4$  children
  - multiple pregnancy
  - large baby ( $>3.5$  kg)

- maternal obesity
- polyhydramnios
- fibroids
- If baby transferred to neonatal unit, ensure neonatologists are aware of mother's views

### CAESAREAN SECTION

- If caesarean section necessary, it must be carried out by senior obstetrician and senior anaesthetist

### Elective surgery

- Inform consultant obstetrician and anaesthetist responsible for woman's care as soon as possible so they can meet with woman and discuss options
- Consider techniques available to reduce intra-operative blood loss, including:
  - normovolaemic haemodilution
  - intra-operative cell salvage
  - tranexamic acid (if available locally)

### TECHNIQUES FOR BLOOD CONSERVATION IN OBSTETRIC CARE

#### Acute normovolaemic haemodilution (ANH)

- Immediate pre-operative collection of 2–3 units of whole blood from mother in citrated bags with simultaneous volume replacement with crystalloid/colloid to maintain normovolaemia
- Reduces the number of red cells lost at surgery
- Can be a primary means of conserving and re-transfusing platelets/coagulation factors – each unit of ANH blood is equivalent to 1 unit RBC + 1 unit FFP + 1.5–2 units of platelets

***Do not suggest autologous blood storage to pregnant women, as the amount of blood required to treat massive obstetric haemorrhage is far in excess of that which could be donated during pregnancy***

### Intra-operative cell salvage (ICS)

- Collection of blood from the operative field
- Collected blood is citrated, filtered, washed with sodium chloride, concentrated and returned to woman
- This technique requires specialist equipment and a dedicated perfusionist – see **Cell salvage** guideline

### MANAGEMENT OF HAEMORRHAGE

#### Post-operative care

- Give  $\geq 40\%$  oxygen for 24 hr and manage in high dependency care area
- Monitor closely (including post-operative blood loss) and inform consultant obstetrician/surgeon immediately of any post-operative complications
- If admission to critical care likely, discuss with on-call critical care consultant
- In extreme cases, in order to lessen oxygen requirement, sedation, analgesia, IPPV with muscle relaxation and controlled hypothermia may be necessary
- Keep woman informed about what is happening

***If any bleeding, act quickly. Inform consultant obstetrician and anaesthetist on-call.***  
***See Antepartum haemorrhage and Postpartum haemorrhage guidelines***

### If standard treatment not controlling bleeding

- Strongly recommend blood transfusion. Woman is entitled to change her mind about a previously agreed treatment plan
- Staff must be satisfied that the woman is not being subjected to pressure from others. It is reasonable to ask accompanying persons to leave the room in order that a senior doctor (with midwife or other colleague) can confirm she is making the decision of her own free will
- If she maintains her refusal to accept blood or blood products, respect her wishes

### Hysterectomy

- Early recourse to surgery may be necessary

### DEATH

- See **Maternal death** guideline

### DISCHARGE AND FOLLOW-UP

- Majority of pregnancies end without serious haemorrhage
- When discharging mother, advise her to report promptly if she has any concerns about bleeding during the puerperium

# REMIFENTANIL PATIENT CONTROLLED ANALGESIA (PCA) USE IN LABOUR • 1/2

## INTRODUCTION

- Remifentanyl is a short-acting opioid analgesic drug
- rapid onset, acting within 1–2 min, with a rapid offset
- non-cumulative irrespective of duration of use
- Provides effective labour analgesia following intravenous administration via PCA pump
- Use in labour is widespread, but unlicensed
- Can lead to transient loss of variability in CTG trace, but is rapidly metabolised and redistributed by the fetus

## Indications for use

- Remifentanyl PCA is less effective than epidural, but can be considered in the following circumstances:
  - coagulopathy
  - previous spinal surgery
  - existent structural or functional deficit of spine
  - localised or systemic infection
  - inability to site epidural
  - intrauterine death

## Criteria for use

- Adequate monitoring and staffing is mandatory as can lead to:
  - maternal sedation
  - respiratory depression
  - nausea
  - vomiting (transient)
- Established labour
- Oxygen saturations must be >95%
- Can be used in conjunction with Entonox® and transcutaneous electrical nerve stimulation (TENS)

## Pump

- Use dedicated PCA pump, e.g. Graseby™ 3300

## Preparation of the PCA

- **Use a dedicated 20 G intravenous cannula for the PCA** (do not use Y-piece connectors)
- do not use for other drugs
- Do not flush it
- Dilute remifentanyl 1 mg in sodium chloride 0.9% 40 mL (25 microgram/mL)
- Start setting of PCA to deliver 25 microgram (1 mL) boluses with a 3 min lock-out period
- **Do not use a background infusion**
- Delivery time of bolus should be <20 sec

## Maternal instructions

- Advise woman to press button as soon as she starts to feel tightening
- IV bolus has onset time of 30–60 sec, peak effect after 2.5 min, and duration of action around 6–7 min
- **Do not use in between contractions**
- Woman **only** to use handset (not midwives or birth partner)

## Regulating dose

- Adjustment of dose or lock-out period may be required as labour progresses
- from 25–37 or 50 microgram bolus (50 microgram bolus most effective dose), **or**
- lock-out period decreased from 3 to 2 min
- If excessive sedation reduce bolus dose

## MONITORING

- Use remifentanyl PCA record form
- Monitor continuous oxygen saturation
- if woman persistently desaturates below 90%:
  - administer oxygen 2 L/min with nasal prongs
  - if no improvement use 4 L/min with mask
- temporarily remove PCA handset until reviewed by anaesthetist
- reset at lower dose or increase lock-out times

## REMIFENTANIL PATIENT CONTROLLED ANALGESIA (PCA) USE IN LABOUR • 2/2

- Record every 5 min, record for 15 min when started, then half hourly:
- non-invasive blood pressure amplifier (NIBP)
- respiratory rate
- heart rate
- applies if and when program changed
- CTG monitoring

### APNOEA

- If no respiratory response by 20 sec, sound emergency call bell/buzzer and summon help
- Lie patient flat in full left lateral position
- administer 100% oxygen via self-inflating bag, valve, face mask until return of spontaneous respiration (or by Hudson mask if making respiratory effort)
- continue until arrival of anaesthetist

### WHEN TO CONTACT ANAESTHETIST

- SpO<sub>2</sub> <90% despite oxygen therapy
- Respiratory rate <10/min
- Sedation score >moderate or P or U (see **Sedation** score below)
- Fetal heart rate <110 bpm
- Record every 5 min, record for 15 min when started, then half hourly:
- non-invasive blood pressure amplifier (NIBP)
- respiratory rate
- heart rate
- applies if and when program changed
- CTG monitoring

### Sedation score

- **A** – fully **A**wake
- **V** – responds to **V**oice
- **P** – needs **P**ainful stimulus to get response
- **U** – **U**nrousable

### COMPLETION OF USE OF REMIFENTANIL PCA

- Midwife to dispose of any remaining drug in syringe as per local controlled drug policy
- Remove 20 G (pink) IV cannula – do not flush

- See **Third stage labour** guideline
- If placenta has not delivered or has shown no signs of separation 20 min after administration of Syntometrine® or oxytocin, prepare to treat promptly for retained placenta after 30 min
- If woman has requested a physiological third stage of labour and placenta has not delivered or shown signs of separation 60 min after birth, advise woman to allow active management of the third stage
- While waiting for placenta to separate, follow **Management** below

**Unnecessary delay increases risk of postpartum haemorrhage**

### MANAGEMENT

- Observe for shock and excessive blood loss
- If the woman is located at a free standing midwifery-led unit, transfer will be necessary – see **Maternal transfer** guideline
- Prepare postnatal oxytocin infusion if actively bleeding – see **Oxytocin** guideline
- Notify delivery suite co-ordinator that placenta has not delivered
- Encourage skin-to-skin/baby to breast
- Assist mother onto bed pan and encourage to empty bladder
- if unsuccessful, catheterise bladder
- Ensure mother is warm
- Ensure large bore IV cannula *in situ* and take blood for FBC and group and save
- Unclamp cord at maternal end to allow blood to drain out of the placenta once baby is detached
- Middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) will perform vaginal examination and check placenta not detached in vagina

**Do not attempt to remove an adherent placenta in delivery room or without anaesthetic**

- Manual removal of placenta (MROP) takes priority over elective cases, even if woman not actively bleeding
- obstetric junior doctor can undertake this procedure under the direct supervision of a middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)
- if blood loss increases or maternal condition deteriorates, accelerate transfer to theatre
- Use gauntlets to protect the operator
- Midwife can accompany woman into theatre to support her throughout
- Administer broad spectrum IV antibiotics
- Following placenta removal, middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) must ensure uterus is empty
- If placenta does not separate see **Morbidly adherent placenta** guideline
- Run oxytocin infusion for 4 hr after removal of placenta
- Following MROP, provide care on delivery suite  $\geq 2$  hr
- Oral broad spectrum antibiotics for 5 days or as local practice
- In the case of postpartum haemorrhage – see **Postpartum haemorrhage** guideline

### Communication

- Ensure woman and her partner are fully informed at all times
- Obstetric middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) will see woman the following day to answer questions, especially in view of the uniquely penetrative nature of the procedure
- Inform woman of increased risk of placental retention in future pregnancy

### Documentation

- Ensure clear and accurate documentation, including:
  - procedure used
  - total estimated blood loss since delivery

### RETAINED PRODUCTS

- Where there is any concern about the completeness of delivered placenta, midwife must notify middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) regardless of mode of delivery
- Insert cannula, take blood for FBC and group and save
- Where there is a confirmed incomplete placenta, take woman to theatre for evacuation of retained products as above for a retained placenta

**PRINCIPLES**

- To encourage women to participate in planning postnatal care and to provide information to enable them to make informed choices
- To provide woman with relevant and timely information to enable her to recognise and respond to problems
- Identified lead professional will be responsible for co-ordinating care for woman and baby in postnatal period, until they are discharged from midwifery care

*Document all discussions in maternal healthcare record*

**POSTNATAL PERIOD**

- A documented, individualised postnatal care plan to be developed with the woman during antenatal period, or as soon as possible after birth. This should include:
  - relevant factors from antenatal, intrapartum and immediate postnatal period
  - details of healthcare professionals involved in care of her and baby
  - plans for postnatal period
  - review at each postnatal contact

**EVERY POSTNATAL CONTACT**

Maternal health	Infant health
<ul style="list-style-type: none"> <li>● Ascertain physical and emotional health and wellbeing</li> <li>● Offer woman opportunity to talk about her birth experience and to ask questions about care received                             <ul style="list-style-type: none"> <li>● inform her about the debriefing service and how/who to contact if required</li> </ul> </li> <li>● Discuss vaginal loss and perineal healing</li> <li>● Look for signs and symptoms of mental health problems</li> <li>● Discuss coping strategies and support</li> <li>● Encourage partner involvement</li> <li>● Provide health promotion information and how to recognise life-threatening and common health problems – see <b>Life-threatening conditions in women and Common health problems in women</b> sections</li> <li>● Confirm contact numbers (if woman is at home and needs to report any concerns)</li> <li>● Women with physical, emotional, social or educational needs – see <b>Women with multi-agency or multidisciplinary needs</b> section</li> <li>● Be alert to signs of domestic abuse. If concerned, follow local child protection and domestic abuse guidance</li> </ul>	<ul style="list-style-type: none"> <li>● Enquire about baby’s health</li> <li>● Provide information about:                             <ul style="list-style-type: none"> <li>● promoting baby’s health and general condition</li> <li>● recognising signs and symptoms of common health problems in newborns and how to contact healthcare professionals as soon as a problem is suspected or in an emergency</li> </ul> </li> <li>● Advise woman to contact healthcare professionals if baby:                             <ul style="list-style-type: none"> <li>● becomes jaundiced (or is jaundiced and it worsens)</li> <li>● passes pale stools</li> </ul> </li> <li>● Provide advice and support on infant feeding                             <ul style="list-style-type: none"> <li>● discuss breastfeeding and document any support required</li> </ul> </li> <li>● Give information regarding local support networks</li> <li>● Check healthcare record for previous alerts</li> </ul>

- During inpatient episodes on delivery suite/midwifery-led unit or postnatal ward, allocate woman and baby a named midwife for each shift who will undertake care, including care as described in **Every postnatal contact** above
- Midwives have direct access for referral to a consultant obstetrician at all times during the postnatal period if required
- It is the responsibility of allocated midwife on postnatal ward to ensure it is safe to accept woman and/baby onto ward
- Ensure all allergies and sensitivities are documented
- Check baby is wearing 2 name bands containing woman's hospital number. Check this against mother's name band

### Women with multi-agency or multidisciplinary needs

- Named midwife will:
  - co-ordinate woman's multi-agency and multidisciplinary needs
  - liaise with named community midwife, lead midwife for vulnerable women and appropriate agencies and healthcare professionals
  - with woman's knowledge and, where possible and safe to do so, ensure appropriate agencies and healthcare professionals are involved according to local practice
- document outcomes of multi-agency or multidisciplinary meetings in woman's postnatal care plan

#### See also the following guidelines:

- Local **Safeguarding** guideline or local **Child protection** guideline
- Local **Mental health problems in pregnancy** guidance (if available)
- **Substance misuse** guideline
- Local **Management of domestic violence in pregnancy** guideline (if available)
- **Infant feeding** guideline

### Initial postnatal period

- See **Care of the newborn at delivery** guideline
- Check woman's wellbeing, ensuring  $\geq 1$  set of general observations have been taken and recorded and are within normal limits

- Assess general condition of baby
- Check that a birth weight has been performed and recorded in all relevant documentation
- Establish vitamin K has been administered and recorded
- Determine chosen method of feeding and obtain details of initial feed on delivery suite
- Commence Red child health record book

### Allocated midwife on postnatal ward will:

- See woman at each handover, review care plan and document in maternal healthcare record
- See **Every postnatal contact** section
- See specific guidelines for appropriate care:
  - **Infant feeding** guideline
  - **Breastfeeding** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)
  - **Hypoglycaemia** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)
- **Care of the newborn at delivery** guideline
- **Caesarean section** guideline
- **Bladder care** guideline

- **Group B streptococcal disease** guideline
- **Pre-labour rupture of membranes (PROM) at term** guideline
- **Substance misuse** guideline
- local **Transitional care** guideline (if available)
- **Hypothermia** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)
- **Jaundice** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)
- **Meconium stained liquor** guideline
- local **Administration of IV antibiotics** guideline, **Admission to SCBU** guideline and **Bed sharing** policy (if available)

**Discharge home from delivery suite/birth unit**

- Dependent upon individual circumstances and preferences, woman may choose to go home from delivery suite/birth unit or to be admitted to postnatal ward
- For home birth, see **Home birth** guideline

*If woman or baby not considered appropriate for early discharge and woman insists on going home, complete a 'Discharge against medical advice' form*

<b>Discharge directly following delivery</b>	<b>Discharge from delivery suite/birth unit/postnatal ward</b>
<ul style="list-style-type: none"> <li>● Provided no risk factor identified and no neonatal indication for admission, the following women may transfer home:                             <ul style="list-style-type: none"> <li>● normal, complication-free vaginal delivery</li> <li>● insignificant meconium stained liquor in labour</li> <li>● any significant problem in previous pregnancy <b>not</b> affecting this birth e.g. previous retained placenta, third degree tear, instrumental delivery</li> <li>● walked to bathroom and passed urine – see <b>Bladder care</b> guideline</li> </ul> </li> <li>● Discuss with team leader/middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)</li> <li>● any mother who does not fit the above criteria but requests early transfer home. Discuss neonatal concerns with ANNP/neonatal staff</li> </ul>	<p>See also <b>Every postnatal contact</b> section</p> <p><b>Midwife will ensure:</b></p> <ul style="list-style-type: none"> <li>● Physical condition of mother and baby is satisfactory, and confirm identification of baby</li> <li>● Referrals for mother and baby organised</li> <li>● Woman’s Hb, rubella and rhesus status have been checked and treated appropriately</li> <li>● Contraception has been discussed</li> <li>● Analgesia has been discussed                             <ul style="list-style-type: none"> <li>● if breastfeeding advice given to avoid codeine/co-codamol</li> </ul> </li> <li>● Smoking, including passive smoking and access to cessation of smoking programme for woman and other family members discussed</li> <li>● Understanding of effective breastfeeding and, if planning to formula feed, correct preparation, sterilisation of equipment and storage of feeds discussed</li> <li>● Cot safety discussed and leaflet provided (if available locally)</li> <li>● Baby car seats discussed</li> <li>● Concerns relayed directly by postnatal midwife to community midwife</li> <li>● Inform woman that community midwife will visit the day after discharge and a subsequent visit will be arranged at that time                             <ul style="list-style-type: none"> <li>● ensure address documented is where the woman will be staying for first community visit, and confirm contact details are correct</li> </ul> </li> <li>● Examination of newborn discussed (if not performed in hospital)</li> <li>● Any necessary appointments are arranged for woman/baby</li> <li>● Parents advised how to register birth</li> <li>● File copy of discharge documentation</li> <li>● Woman has all relevant documentation, leaflets and prescribed medication</li> <li>● Give contact numbers to enable woman to report any concerns</li> </ul>

**Postnatal visiting**

**Community midwife will:**

- Visit woman at home on day following discharge and offer ≥2 further postnatal contacts (day of delivery is day 0)
- **second contact:** day 5, to weigh baby and perform bloodspot test
- **third contact:** on or after day 10, to weigh baby and transfer care to GP and health visitor if appropriate
- date and venue to be agreed with woman. Can be at home or clinic
- Discuss individual social, clinical and emotional needs, taking into account the views and beliefs of woman, her partner and family
- See also **Every postnatal contact** section at beginning of guideline

*Community team leader is responsible for ensuring all caseloads are picked up during periods of annual leave and/or sickness*

**Newborn screening**

- **It is the midwife's responsibility to:**
  - discuss newborn screening with parents ≥1 day before being performed
  - provide national screening committee leaflet 'Screening tests for your baby'
  - obtain consent and take sample on day 5 (count date of birth as day 0). See **Bloodspot screening guideline** in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)
  - ensure sufficient neonatal barcode labels available (if used locally) for when test is taken
  - complete request card **after** performing test

- apply separate neonatal barcode label to each sheet of the card after checking details with parent(s)
- place specimen in correctly addressed envelope (use appropriate addressograph label)
- send to regional screening unit on day sample taken
- document according to local practice
- inform parent(s) that health visitor will relay 'normal' results
- if any results abnormal or borderline, parent(s) will be contacted directly

**Preterm baby  
(<36 weeks' gestation)**

- If baby almost 36 weeks' gestation, sample may be postponed for a few days to prevent unnecessary repeat
- Inform parent(s) baby will need a repeat sample at 36 weeks corrected age for congenital hypothyroidism and arrange to visit and repeat test at the appropriate time

First 24 hr following initial delivery assessment

Woman's wellbeing	Baby's wellbeing and feeding
See also Every postnatal contact section	
<p><b>Midwife will:</b></p> <ul style="list-style-type: none"> <li>● Give information related to physiological process of recovery in postnatal period</li> <li>● Discuss the following signs and symptoms of life-threatening conditions and how to contact their healthcare professional or call for emergency help:                             <ul style="list-style-type: none"> <li>● sudden profuse blood loss</li> <li>● offensive/excessive vaginal loss</li> <li>● tender abdomen</li> <li>● fever</li> <li>● severe or persistent headache</li> </ul> </li> <li>● raised BP with other signs of pre-eclampsia</li> <li>● chest pain and/or shortness of breath</li> <li>● unilateral calf pain/redness or swelling</li> <li>● In first 6 hr following delivery, assess and document BP (see <b>Hypertension</b> guideline) and first urine void (see <b>Bladder care</b> guideline)</li> <li>● Record maternal observations</li> <li>● If offensive/excessive loss, abdominal tenderness or fever, assess vaginal loss, uterine involution and position</li> <li>● Offer assessment of the perineum to any woman who suffered perineal trauma – see <b>Episiotomy</b> guideline, <b>Perineal trauma suturing (tears and episiotomy)</b> guideline and <b>Third and fourth degree tears</b> – <b>OASIS</b> guideline</li> <li>● Ask about headache symptoms. If epidural or spinal used, advise woman to report headache, particularly if occurring while sitting or standing</li> <li>● Assess thrombosis risk – see <b>VTE</b> guidelines and refer to obstetrician if appropriate</li> <li>● Give woman opportunity to discuss the birth</li> <li>● Encourage gentle mobilisation</li> <li>● Give information on mental wellbeing</li> <li>● Update postnatal care plan</li> <li>● Ensure all contact numbers are clearly documented in maternal healthcare record and that woman and, if appropriate, partner/family also aware</li> <li>● <b>Ensure all discussions clearly documented</b> in maternal healthcare record</li> </ul>	<p><b>Midwife will:</b></p> <ul style="list-style-type: none"> <li>● Confirm and document urine passed</li> <li>● Confirm meconium passed, if not, assess baby and seek medical opinion</li> <li>● Ensure woman has received information regarding:                             <ul style="list-style-type: none"> <li>● bathing – advise that cleansing agents, lotions and medicated wipes are not recommended in first 6 weeks</li> <li>● keeping the umbilical cord clean and dry (do not use antiseptic)</li> <li>● cot safety</li> <li>● parents aware of bed-sharing guidance from the Department of Health. The safest place for baby to sleep is in a cot in parents' room for first six months</li> </ul> </li> </ul> <p><b>Feeding</b></p> <ul style="list-style-type: none"> <li>● Observe a full feed and offer ongoing feeding support</li> <li>● Outline the benefits of colostrum and breastfeeding (this information should be culturally appropriate) – see <b>Breastfeeding</b> guideline in the Staffordshire, Shropshire &amp; Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)</li> <li>● If artificial feeding, see <b>Infant feeding</b> guideline and Staffordshire, Shropshire &amp; Black Country Newborn and Maternity Network Neonatal <b>Nutrition and enteral feeding</b> guideline (if used locally)</li> </ul> <p style="text-align: center;"><b>Ensure all discussions/numbers given are clearly documented</b></p>

Care in first week

Mother's wellbeing	Baby's wellbeing and feeding
See also <b>Every postnatal contact</b> section	
<p><b>Midwife will:</b></p> <ul style="list-style-type: none"> <li>● Ensure Rh–D negative woman is offered anti-D immunoglobulin within 72 hr of delivering an Rh-D positive infant</li> <li>● ≤3 days – discuss normal patterns of emotional changes in the postnatal period and that these usually resolve within 10–14 days</li> <li>● Discuss the importance of appropriate exercise, rest and diet, including high fibre foods and adequate fluid intake</li> <li>● If woman reports persistent fatigue, and suffered a postpartum haemorrhage, check Hb</li> <li>● Offer information and reassurance on involuntary leakage of small amounts of urine commonly experienced after birth – see <b>Bladder care</b> guideline</li> <li>● Advise woman to report concerns about haemorrhoids, rectal pain or bleeding, and if she has not opened her bowels ≤3 days of delivery or regained her normal pattern</li> <li>● Give perineal hygiene information</li> <li>● Offer women with low-level or no immunity to rubella on antenatal screening an MMR vaccination before discharge from maternity unit if possible. Can be given with anti-D injection, provided separate syringe is used and administered into different limb</li> <li>● if not given simultaneously, give MMR 3 months after anti-D</li> <li>● advise woman to avoid pregnancy for 1 month after receiving MMR, but breastfeeding may continue</li> </ul>	<p><b>Midwife will:</b></p> <ul style="list-style-type: none"> <li>● Discuss all aspects of baby's physical health and wellbeing with parent(s), including continuous assessment of feeding</li> <li>● Inform parent(s) a full examination of baby will be performed ≤72 hr of life and encourage them to be present. Provide full explanation including results of any tests</li> <li>● Review family health history and address parental concerns</li> <li>● Discuss neonatal screening</li> <li>● Assess baby's general condition. Healthy babies should have normal colour for their ethnicity, maintain a stable body temperature and pass urine and stools at regular intervals</li> <li>● Assess feeding behaviour – see <b>Infant feeding</b> guideline and <b>Breastfeeding, Nutrition and enteral feeding and Hypoglycaemia</b> guidelines in the Staffordshire, Shropshire &amp; Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)</li> <li>● Look for signs and symptoms of baby becoming unwell e.g. excessive irritability, tense, high temperature, sleepy or floppy</li> <li>● Assess parent(s) for emotional attachment and offer information and support in adjusting to their new parenting role</li> <li>● If any jaundice, record intensity, together with baby's hydration and alertness. If significantly jaundiced or unwell, inform medical staff and arrange evaluation of serum bilirubin level – see <b>Jaundice</b> guideline in the Staffordshire, Shropshire &amp; Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)</li> <li>● provide parent(s) information on, reason for and how to monitor jaundice (normally occurring around 3–4 days after birth)</li> <li>● Weigh baby once within first week of life. If problem identified, more frequent weighing may be necessary</li> <li>● If weight loss not within normal limits, inform parent(s) and take appropriate action</li> </ul>

## Care in first week *cont.*

Mother's wellbeing	Baby's wellbeing and feeding
See also <b>Every postnatal contact</b> section	
<p><b>Midwife will:</b></p> <ul style="list-style-type: none"> <li>● Discuss future methods of contraception</li> <li>● Look for changes in mood and emotional state, signs and symptoms of health problems. Seek information from family/partner if appropriate</li> <li>● Observe for risks, signs and symptoms of domestic and child abuse and refer appropriately</li> <li>● Update postnatal care plan using variances when required</li> </ul>	<p><b>Midwife will:</b></p> <ul style="list-style-type: none"> <li>● If parent(s) concerned about baby's skin, advise to contact a healthcare professional</li> <li>● Ensure bloodspot screening performed – see <b>Newborn screening</b> section and <b>Bloodspot screening</b> guideline in the Staffordshire, Shropshire &amp; Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)</li> <li>● Explain bowel movement pattern in a normal neonate and inform parent(s) to seek advice from healthcare professional if concerned about baby's bowel movements or urine output</li> <li>● Update postnatal care plan, including variances where required and all discussions with parent(s)</li> </ul>

## LIFE-THREATENING CONDITIONS IN WOMEN

Possible sign/symptom	Evaluate for
<ul style="list-style-type: none"> <li>● Tachypnoea</li> <li>● Sudden or profuse blood loss</li> <li>● Blood loss and signs and symptoms of shock, including:                             <ul style="list-style-type: none"> <li>● tachycardia and hypotension</li> <li>● hypoperfusion</li> <li>● hypovolaemia</li> <li>● change in consciousness</li> </ul> </li> </ul>	Postpartum haemorrhage (PPH) – see <b>Postpartum haemorrhage (PPH)</b> guideline
<ul style="list-style-type: none"> <li>● Offensive/excessive vaginal loss</li> <li>● Tender abdomen or fever</li> </ul>	PPH/sepsis/other pathology – see <b>Postpartum haemorrhage (PPH)</b> guideline and <b>Sepsis</b> guideline
<ul style="list-style-type: none"> <li>● Fever</li> <li>● Shivering</li> <li>● Abdominal pain</li> <li>● Tachypnoea</li> <li>● Offensive vaginal loss</li> </ul>	Infection/genital tract sepsis
<ul style="list-style-type: none"> <li>● Severe or persistent headache</li> <li>● Diastolic BP &gt;90 mmHg and other signs of pre-eclampsia</li> </ul>	Pre-eclampsia/eclampsia – see <b>Eclampsia</b> guideline and <b>Severe pre-eclampsia</b> guideline
<ul style="list-style-type: none"> <li>● Shortness of breath or chest pain</li> </ul>	Pulmonary embolism
<ul style="list-style-type: none"> <li>● Unilateral calf pain</li> </ul>	Deep vein thrombosis

<b>COMMON HEALTH PROBLEMS IN WOMEN</b>	
<b>Condition</b>	<b>Action</b>
Baby blues	<ul style="list-style-type: none"> <li>● If symptoms persist &gt;10–14 days, refer to GP for postnatal depression assessment</li> </ul>
Perineal <ul style="list-style-type: none"> <li>● Pain</li> <li>● Discomfort</li> <li>● Stinging</li> <li>● Offensive odour or dyspareunia</li> </ul>	<ul style="list-style-type: none"> <li>● Perineal assessment and evaluate for signs of:                             <ul style="list-style-type: none"> <li>● infection</li> <li>● inadequate repair</li> <li>● wound breakdown or non-healing</li> </ul> </li> <li>● Refer as appropriate to GP/middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)</li> <li>● Advise topical use of cold therapy and paracetamol (if not contraindicated)</li> <li>● if neither effective, consider oral or rectal non-steroidal anti-inflammatory drug</li> </ul>
Headache	<ul style="list-style-type: none"> <li>● Advise women who have had an epidural/spinal anaesthesia to report positional headache</li> <li>● For tension/migraine headaches, offer advice on relaxation and avoiding precipitating factors</li> </ul>
Persistent fatigue	<ul style="list-style-type: none"> <li>● Ask about general wellbeing and provide advice on diet and exercise</li> <li>● If condition affects woman's care of herself or baby, evaluate underlying causes</li> <li>● Measure Hb and, if low, treat according to local practice</li> </ul>
Backache	<ul style="list-style-type: none"> <li>● Manage as general population</li> </ul>
Constipation	<ul style="list-style-type: none"> <li>● Assess diet and fluid intake</li> <li>● if changes in diet ineffective, advise use of gentle laxative</li> </ul>
Haemorrhoids	<ul style="list-style-type: none"> <li>● If severe, swollen or prolapsed, evaluate and refer to GP for further evaluation/treatment</li> <li>● otherwise, treat with haemorrhoid cream and provide advice on dietary measures to avoid constipation</li> </ul>
Faecal incontinence	<ul style="list-style-type: none"> <li>● Assess severity, duration and frequency. If symptoms do not resolve, refer to middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)/incontinence nurse</li> </ul>
Urinary incontinence	<ul style="list-style-type: none"> <li>● Teach pelvic floor exercises</li> <li>● If symptoms persist refer to incontinence nurse</li> </ul>

**HEALTH PROBLEMS IN BABIES**

<b>Problem</b>	<b>Action</b>
Jaundice in first 24 hr	● Refer urgently to paediatrician
Jaundice in babies aged >24 hr	● Monitor and record jaundice and overall wellbeing, hydration and alertness
Jaundice from aged 7 days or lasting >14 days	● Refer to paediatrician
Significant jaundice or unwell babies	● Evaluate serum bilirubin and refer to paediatrician
Jaundice in breastfed babies	● Advise frequent feeding, waking baby to feed if necessary, routine supplementation is not recommended
Thrush	● Offer information and guidance on hygiene. If appropriate, refer to GP for antifungal treatment
Nappy rash	● Consider hygiene and skin care, sensitivity, infection, e.g. thrush
Persistent nappy rash	● Refer to GP for consideration of antifungal medication
No meconium in first 24 hr	● Refer to paediatrician urgently
Diarrhoea	● Refer to paediatrician urgently
Excessive inconsolable crying	<ul style="list-style-type: none"> <li>● Needs urgent action</li> <li>● Reassure parents</li> <li>● Assess general health:                             <ul style="list-style-type: none"> <li>● antenatal and perinatal history</li> <li>● onset and length of crying</li> <li>● nature of stools</li> <li>● feeding</li> <li>● woman's diet if breastfeeding</li> <li>● family allergy</li> <li>● parents' response</li> <li>● factors that make crying better/worse</li> </ul> </li> </ul>
Colic	<ul style="list-style-type: none"> <li>● Advise parents that holding baby during a crying episode and peer support may be helpful</li> <li>● Do not use dicycloverine</li> </ul>
Colic in formula-fed babies	● Consider hypo-allergenic formula
Unwell baby	● Refer urgently to paediatrician

**Wellbeing and care in first 2–8 weeks**

Mother's wellbeing	Baby's wellbeing and feeding
See also <b>Every postnatal contact</b> section	
<p><b>Midwife will:</b></p> <ul style="list-style-type: none"> <li>● Ask woman about her physical, emotional and social wellbeing, and the wellbeing of her baby. Recognise symptoms that may need discussion/action</li> <li>● Discuss resumption of sexual intercourse and possible dyspareunia</li> <li>● Use routine screening questions for postnatal depression (within 10–14 days)</li> <li>● Enquire about and give information on:                             <ul style="list-style-type: none"> <li>● headache</li> <li>● perineal pain, discomfort, stinging, offensive odour or dyspareunia</li> <li>● persistent fatigue</li> <li>● backache</li> <li>● constipation</li> <li>● haemorrhoids</li> <li>● urinary or faecal incontinence</li> <li>● urine retention (within 6 hr of birth)</li> </ul> </li> <li>● Promote emotional attachment and improved parenting skills</li> <li>● Provide information on local/national/voluntary groups that provide support and guidance in the postnatal period</li> <li>● Discuss sudden infant death syndrome with parents, in line with DoH guidance</li> <li>● Update postnatal care plan using variances when required. Document all discussions</li> </ul>	<p><b>Midwife will:</b></p> <ul style="list-style-type: none"> <li>● Assess baby's feeding</li> <li>● Provide advice and support woman's choice of feeding and document in postnatal plan</li> <li>● Reinforce relevant safety issues for all family members in the home environment and promote safety education (e.g. safe sleeping). If parents choose to bed-share with baby, explain the increased risk of sudden infant death syndrome if either parent: smokes, has recently drunk alcohol, taken medication or drugs that make them sleep more heavily, or is very tired</li> <li>● Discourage use of a dummy</li> <li>● Discuss smoking, including passive smoking and access to cessation of smoking programme for woman and other family members if required</li> <li>● Be alert to signs and symptoms of child abuse. If there are concerns, follow local child protection procedures</li> <li>● Document all discussions in maternal healthcare record and baby healthcare record (Red book)</li> </ul>

**Discharge from community midwifery care**

- See also **Every postnatal contact** section

**Community midwife will:**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Assess physical/emotional and social wellbeing of mother and baby before discharge</li> <li>● Discuss health issues e.g. breast awareness, cervical cytology, contraception and preconception advice</li> <li>● Discuss arrangements for woman to attend for postnatal examination with GP approximately 6 weeks after birth</li> <li>● Ensure necessary referrals for mother and baby have been completed</li> </ul> | <ul style="list-style-type: none"> <li>● Reinforce how to register baby's birth</li> <li>● Discuss role of health visitor with parent(s)</li> <li>● Complete necessary documentation in child healthcare record, to ensure comprehensive handover of care to health visitor</li> <li>● Reinforce advice regarding local postnatal support/drop-ins/contact numbers and how to access them</li> <li>● Ensure postnatal record completed and returned to hospital to enable maternal healthcare record to be filed and returned to medical records</li> <li>● In all out of area deliveries, ensure midwifery postnatal records are returned to appropriate hospital as per local practice</li> </ul> |
|--|---|

## BACKGROUND

- Sepsis is any suspected or known infection associated with a systemic inflammatory response
- Sepsis is a leading cause of maternal mortality in the UK and the most common cause of maternal mortality in the critical care unit (CCU)
- If septicaemic shock develops, mortality rates approach 60% in CCU
- Early detection, accurate diagnosis and aggressive appropriate treatment can significantly improve outcome
- One-third of women who die do so because of refractory hypotension whilst the rest die later from multi-organ failure

## Risk factors for maternal sepsis

- Obesity
- Impaired glucose tolerance/diabetes
- Impaired immunity
- Anaemia
- Vaginal discharge
- History of pelvic infection
- Amniocentesis and other invasive intrauterine procedures
- Cervical cerclage
- Prolonged rupture of membranes (PROM)
- Vaginal trauma
- Caesarean section
- Wound haematoma
- Self or family history of, or contact with upper respiratory tract infection
- Group A *streptococcus* disease in close family/contacts
- Sickle cell disease/trait
- Black/ethnic minority
- Retained products of conception after miscarriage, termination of pregnancy or delivery

## RECOGNITION AND ASSESSMENT

Use a MEWS chart for all maternity inpatients to identify seriously ill pregnant women and refer them to critical care and obstetric anaesthetic colleagues according to local guidance

**Consider sepsis in any woman with symptoms and signs suggestive of abruption**

## Symptoms, signs and laboratory results

- Rigors, sweating, fever
- Headache, muscle pain, altered mental state, lethargy, poor appetite
- Features of primary infection. Consider especially genital tract sepsis (chorioamnionitis, postpartum endometritis); also wound infection, pyelonephritis, pneumonia, acute appendicitis, acute cholecystitis, pancreatitis, necrotising fasciitis, mastitis
- **An abnormal or absent fetal heart beat** with or without placental abruption may be the result of sepsis
- Sepsis is the presence of 1 of the above symptoms plus 2 of the following:
  - heart rate >100 beats/min
  - respiratory rate >20 breaths/min
  - temperature >38°C or <36°C
  - WBC >12 or <4 x 10<sup>9</sup>/L – WBC normally raised in labour
  - normal WCC with >10% immature forms or increased CRP
  - hyperglycaemia in the absence of diabetes (plasma glucose >7.7 mmol/L)
  - acutely altered mental state

## Genital tract sepsis

- Vomiting and diarrhoea, and/or abdominal pain
- often attributed to gastroenteritis
- Vaginal discharge, wound infection
- Rash (generalised streptococcal maculopapular rash)
- discolouration or mottling of the skin may indicate cellulitis

**Life-threatening features**

- **Severe sepsis:** sepsis with impaired organ function [e.g. diminishing renal function, impaired cardiac function, hypoxia, acidosis, acute respiratory distress syndrome (ARDS), clotting disturbance, plasma lactate >4.0 mmol/L]
- **Septic shock:** severe sepsis with systolic BP <90 mmHg or mean arterial pressure (MAP) <65 mmHg

**Investigations****Sepsis**

- Swabs:
  - vaginal
  - endo-cervical (if swabs for chlamydia PCR, use chlamydia detection kit; if for N. gonorrhoea culture, place swab in charcoal medium)
  - wound
  - throat when indicated – dependent on local pathway
- FBC and differential WBC
- INR, APTT
- Group and save
- Biochemical screen (U&E, LFT and C-reactive protein)
- Glucose
- Culture
  - blood x 2 (take 3 only if infective endocarditis suspected)
  - urine
  - if woman has travelled abroad recently or enteric infections suspected, faeces
  - if any hint of meningitis, CSF (omit if woman confused or intracranial pressure raised)
- If infection suspected during labour or delivery (e.g. pyrexia, offensive smelling liquor, smelly baby, unexpectedly flat baby at birth), take swabs from vagina, placenta and baby (ear, throat, skin) for microbiology
- Send placenta to histology

**Severe sepsis****Add**

- Measure venous plasma lactate
- Arterial blood gases (ABG), acid-base and lactate
- Chest X-ray
- If source of infection not apparent, consider CT scan, ultrasound scan and nuclear medicine imaging
- If woman known to be positive for **ESBL or MGNB**, re-screen for carriage of multi-resistant Gram-negative bacilli with rectal swab and, if urinary catheter *in situ*, CSU

**Differential diagnosis**

- Systemic disease: occult haemorrhage, myocardial infarction, adrenal insufficiency, pulmonary embolism

**OBSERVATIONS****Take and record on high dependency chart or maternity early warning scoring (MEWS) chart**

- Temperature
- Heart rate
- Blood pressure using automated non-invasive blood pressure device
- Respiratory rate
- Oxygen saturation
- Peripheral perfusion
- Urinalysis
- Hourly urine output
- Fluid intake, oral and IV
- Lochia if appropriate

**Severe sepsis****Observations listed above plus**

- Level of consciousness, use Glasgow coma scale
- Commence 3-lead ECG
- If central line inserted, central venous pressure (CVP)
- If gestation appropriate and not delivered, continuous electronic fetal monitoring (EFM)

## MANAGEMENT OF PYREXIA IN LABOUR

- If maternal temperature >37.5°C on 1 occasion:
- keep woman cool
- administer paracetamol 1 g oral repeated 6-hrly as required
- avoid dehydration
- record temperature hourly until apyrexial
- note: temperature rises with epidural *in situ*

### High or prolonged pyrexia

- If maternal temperature >38°C once or >37.5°C on 2 occasions 2 hr apart:
- commence external EFM
- MSU or catheter specimen of urine
- high vaginal swab or low vaginal swab
- blood culture x 2
- Liaise with neonatologists to consider their presence at delivery
- Start IV antibiotics

## MANAGEMENT OF SEVERE SEPSIS

**Severe sepsis is an emergency. Involve consultant obstetrician at an early stage.**

**Consultant obstetrician will seek advice from other specialists e.g. anaesthetist, haematologist, microbiologist and intensivist**

### Key actions (from 'Surviving sepsis')

Tests	Treatment
<ul style="list-style-type: none"> <li>● FBC and blood cultures before antibiotics</li> <li>● Measure serum lactate</li> <li>● Measure urine output hourly</li> </ul>	<ul style="list-style-type: none"> <li>● Broad spectrum antibiotics</li> <li>● IV fluids</li> <li>● Oxygen</li> </ul>

## Airway and breathing

- Adequate oxygen therapy to maintain SpO<sub>2</sub> 94–98%
- If increased difficulty in breathing, contact critical care team to consider intubation and ventilation

## Circulation

- Secure IV access with 2 large bore cannulae
- Avoid siting epidural or spinal anaesthesia
- Ensure adequate fluid replacement
- colloid 20 mL/kg or crystalloid [compound sodium lactate (Hartmann's) or sodium chloride 0.9%] 40 mL/kg over <30 min then reassess
- If no response to simple resuscitation measures, insert CVP line and monitor to guide further fluid replacement
- If anaemic, transfuse blood
- If woman remains hypotensive despite adequate fluid replacement, transfer to critical care for further management

## Antibiotics

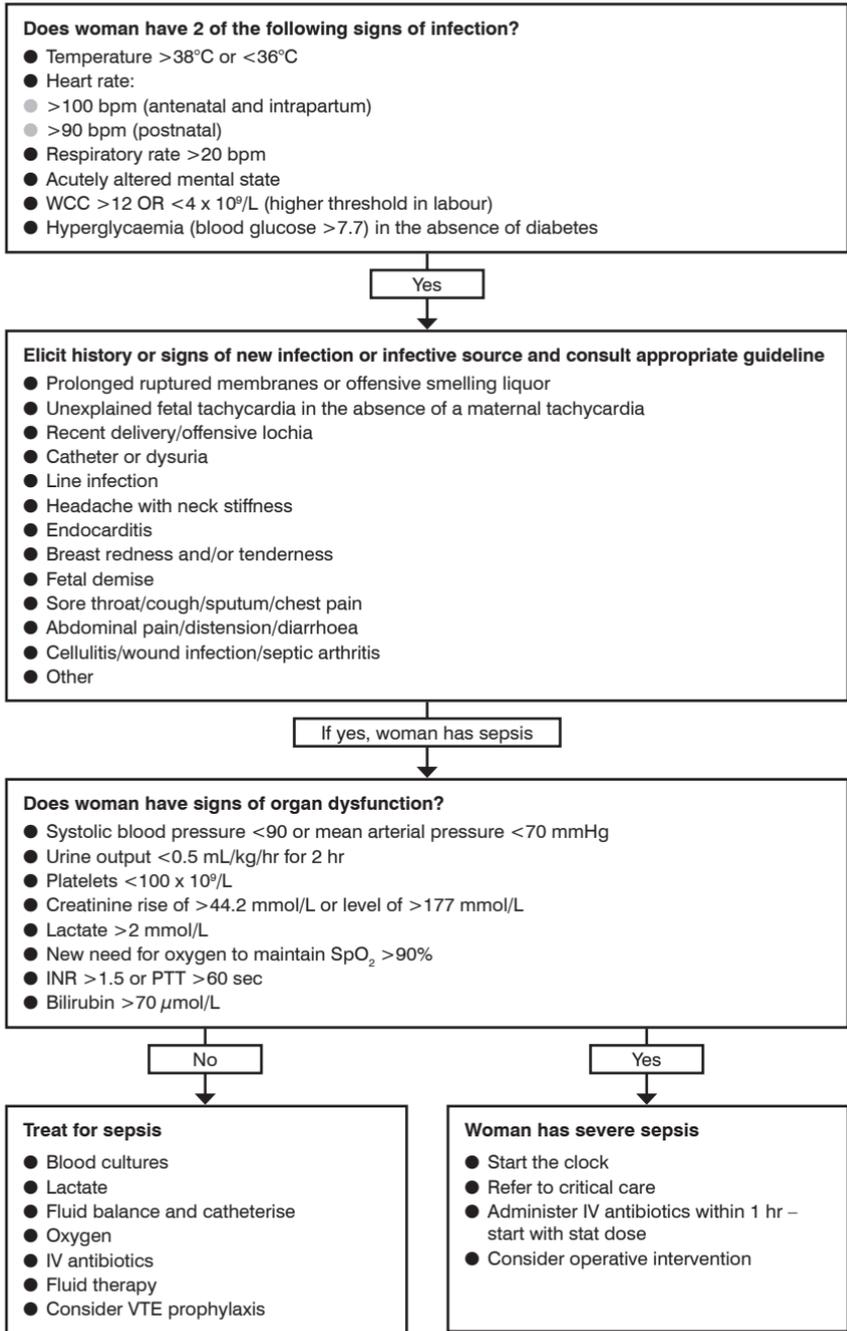
**After obtaining urgent bloods, swabs and cultures, administer high dose broad spectrum IV antibiotics immediately without waiting for microbiology results**

- Choice of antibiotic therapy depends on clinical suspicions and local flora and culture information (if available)
- Treatment should include cover for:
  - Gram negative and anaerobic organism
  - if likelihood of infection is high, Gram positive cover

**FURTHER MANAGEMENT**

- Remove source of infection
- closed-space infections need surgical drainage including evacuation of retained products of conception
- Consider VTE prophylaxis
- Consider delivery
- regional anaesthesia may be contraindicated
- If woman already extremely ill, deteriorates or does not improve, consider additional or alternative IV antibiotics – seek further **early** advice from consultant microbiologist
- repeat microbiological specimens and mark 'urgent'
- In women with endometritis not responding to antibiotics, consider septic pelvic thrombosis
- In presence of uterine sepsis, carefully counsel women requesting conservative management about maternal risks
- Necrotising fasciitis requires early surgical intervention with fasciotomy and aggressive antibiotic therapy
- If Group A *streptococcus* disease suspected, inform neonatologists. If confirmed, this is a notifiable disease
- Be prepared for haemorrhage from uterine atony and DIC

**Sepsis/severe sepsis screening and management flowchart**



**DEFINITIONS**

- **Pre-eclampsia:** pregnancy induced hypertension with significant proteinuria +/- oedema affecting virtually any organ system in the body
- **Severe pre-eclampsia:** diastolic blood pressure >110 mmHg or systolic blood pressure ≥160 mmHg on >2 occasions, with significant proteinuria
- **Mild to moderate pre-eclampsia:** BP <160/110 and proteinuria with ≥1 of symptoms and signs listed below (see **RECOGNITION AND ASSESSMENT** below)

**Maternal and fetal complications associated with severe pre-eclampsia**

Maternal	Fetal
<ul style="list-style-type: none"> <li>● Eclampsia</li> <li>● Placental abruption</li> <li>● Severe hypertension</li> <li>● Risk of cerebral haemorrhage</li> <li>● Pulmonary oedema</li> <li>● Renal failure</li> <li>● Liver failure or ruptured liver</li> <li>● Disseminated intravascular coagulation (DIC)</li> <li>● HELLP syndrome</li> <li>● Pulmonary haemorrhage</li> <li>● Aspiration pneumonia</li> <li>● Retinal detachment</li> <li>● Circulatory collapse</li> <li>● Maternal death</li> </ul>	<ul style="list-style-type: none"> <li>● Prematurity</li> <li>● Intrauterine growth restriction</li> <li>● Acute fetal distress</li> <li>● Placental abruption</li> <li>● Intrauterine death</li> <li>● Respiratory distress syndrome</li> </ul>

**RECOGNITION AND ASSESSMENT**

**Symptoms**

- Headache
- Visual disturbance
- Epigastric pain
- Vomiting
- Sudden swelling of face, hands or feet
- Oedema

**Signs**

- Hyperreflexia with clonus
- Abdominal tenderness – right upper quadrant
- Proteinuria ≥1+ or protein/creatinine ratio of >30 mg/mmol or >0.3 g in 24 hr
- Papilloedema
- Liver tenderness
- Platelet count falling or <100 x 10<sup>9</sup>/L
- Abnormal liver enzymes (ALT or AST rising or >70 IU/L)

**Investigations**

*Urine*

- Dipstick measurement; proteinuria ≥1+
- Confirm significant proteinuria with/without symptoms if:
  - ≥300 mg protein in validated 24 hr urine collection or
  - urinary protein/creatinine ratio >30 mg/mmol

*Blood*

- FBC
- If platelet count <100 x 10<sup>9</sup>/L, perform clotting studies
- LFT
- U&E and uric acid
- Group and save

## IMMEDIATE MANAGEMENT

- Admit all women with severe pre-eclampsia or eclampsia
- Give high dependency care – see **High dependency care** guideline
- Carefully explain problem and management to woman and birth partner

## Multidisciplinary team planning

- Ensure early involvement and liaison between middle grade obstetrician (ST3-7 or equivalent e.g. staff grade, clinical fellow) or consultant, anaesthetist, intensive care specialists, delivery suite midwife co-ordinator and neonatologist in assessment and management of women with suspected or proven severe pre-eclampsia and eclampsia

## Monitoring

- If in labour, start high dependency care chart in addition to partogram

## Minimum requirement

- Maternal pulse and BP – with woman rested and sitting at a 45° angle every 15 min until stabilised, then every 30 min
- ensure appropriate cuff size used and placed at level of heart
- use multiple readings to confirm diagnosis
- use an automated machine that has been validated for use in pregnancy
- Oxygen saturations continually and recorded hourly – obstetric review if <95%
- Respiratory rate hourly
- Urine volumes via indwelling urinary catheter hourly
- Fetal heart rate – continually by electronic fetal monitoring (EFM) – see **Electronic fetal monitoring** guideline

## Examine

- Optic fundi for signs of haemorrhage and papilloedema
- Assess for hyperreflexia and clonus

## TREATMENT

- Give antacid prophylaxis e.g. ranitidine 150 mg oral 6-hrly (if oral inappropriate, 50 mg IM 6-hrly)
- If fetus <35 weeks' gestation, give betamethasone two 12 mg doses IM 12 or 24 hr apart (depending on clinical situation) to promote fetal lung maturity

## Blood pressure control

*The aim of antihypertensive therapy is to maintain systolic BP <150 mmHg and prevent cerebral haemorrhage and hypertensive encephalopathy*

### When

- In women with a systolic blood pressure >160 mmHg or diastolic blood pressure >110 mmHg, begin antihypertensive treatment

### How

- Labetalol oral and IV, nifedipine oral (unlicensed) and hydralazine IV are commonly used agents of choice for severe hypertension – see **Drug treatment regimen** below

### Notes

- Consider insertion of arterial line in woman who will be receiving continuous IV antihypertensive; close liaison with anaesthetist is essential
- Consider giving up to 500 mL crystalloid fluid before or at the same time as first dose of hydralazine IV in antenatal period
- IV anti-hypertensives are an indication for EFM
- Avoid rapid fall in blood pressure as this can potentiate fetal distress
- Aim to keep blood pressure <150/80–100 mmHg

## Prevention of seizures

- Administer magnesium sulphate prophylaxis – see **Magnesium sulphate** overleaf

**Fluid management****Amount of fluid**

- Unless ongoing haemorrhage, avoid fluid overload – limit total IV input to 1 mL/kg/hr
- include **all** drugs administered in the hourly volume input of fluid
- increased fluids may be required at insertion of regional analgesia/ anaesthesia
- Always use syringe driver or infusion pump to control delivery of fluids
- Continue fluid restriction until middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant confirms diuresis is occurring

**Type of fluid**

- If marked hypovolaemia due to haemorrhage (>500 mL), haemolysis or DIC, give blood +/- blood products – discuss with haematologist

**Monitoring**

- Measure fluid input and output hourly via urinometer
- insert Foley indwelling catheter to measure urine output
- When pre-eclampsia is complicated by pulmonary oedema, persistent oliguria or significant blood loss, consider CVP monitoring after discussion with anaesthetist

**Oliguria**

- During labour and after delivery, oliguria is not uncommon
- renal failure is unusual in pre-eclampsia and is usually associated with additional problems e.g. haemorrhage and sepsis
- give woman with severe pre-eclampsia controlled fluid and wait for natural diuresis to occur approximately 36–48 hr after delivery

- if oliguria <100 mL over 4 hr period, stop magnesium sulphate and request middle grade (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant review
- If oliguria <100 mL over 2 consecutive 4 hr periods, check catheter draining, auscultate chest and check U&E, platelet and LFT urgently
- Middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant review
- If signs of pulmonary oedema, or input >750 mL in excess of output, give furosemide 20 mg IV
- if no signs of fluid overload, give 250 mL colloid fluid challenge and assess response
- if oliguria persists (<50 mL over 4 hr), middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) to review and consider furosemide and central venous pressure (CVP) monitoring
- if prolonged antenatal oliguria or anuria, prepare for delivery

**Thromboembolism**

- Give thromboprophylaxis (see **VTE – Thromboprophylaxis** guideline)

**DELIVERY**

- Once woman stable, consultant obstetrician and anaesthetist make decision to deliver. Liaise with neonatology team
- Consider fetal presentation and condition, together with likelihood of success of induction of labour
- >34 weeks' gestation with cephalic presentation, consider vaginal delivery
- in <32 weeks' gestation, prefer caesarean section
- If vaginal delivery planned, plan short second stage with consideration of elective operative vaginal delivery

**Notes**

- Epidural is a useful method of controlling blood pressure and providing analgesia but may be contraindicated in low platelet count
- If oxytocin indicated for induction of labour or augmentation, give IV via syringe driver and administer a reduced fluid regime

**Managing third stage of labour**

- Manage third stage with oxytocin 10 units IM (unlicensed) or 5 units IV

***Do not give ergometrine or Syntometrine® in any form for prevention of haemorrhage as this can further increase blood pressure***

**ECLAMPSIA**

- $\geq 1$  convulsion superimposed on pre-eclampsia
- See **Eclampsia** guideline

**HELLP SYNDROME**

- Haemolysis, elevated liver enzymes and low platelets (HELLP) occurs in approximately 4–12% of women with severe pre-eclampsia. It is associated with high perinatal mortality

**Symptoms**

- Can present with vague symptoms which often delay diagnosis
- nausea
- vomiting
- epigastric pain and right upper-quadrant pain
- A unique feature of HELLP syndrome is 'coca-cola' appearance of urine; small amounts of dark black urine are produced

**Diagnosis**

- Confirmed by:
  - fragmented red cells on blood film
  - platelet count  $< 100 \times 10^9/L$
  - Elevated AST  $> 75$  IU/L significant and  $> 150$  IU/L is associated with maternal morbidity
- Severe hypertension is not always a feature of HELLP syndrome and degree of severity rarely reflects overall severity of the disease

**Management**

As for severe pre-eclampsia plus:

- Evaluate severity
- Hourly BM
- Monitor conscious level and look for signs of confusion
- Stabilise
- Do not use betamethasone or dexamethasone for treatment of HELLP syndrome
- Early blood transfusion – these women are often profoundly anaemic
- Contact haematologist early for advice about replacement of clotting factors
- **Deliver**
- Postnatal recovery often more complicated, with oliguria and a slow recovery of biochemical parameters

**POSTNATAL MANAGEMENT AND FOLLOW-UP**

- Up to 44% of convulsions occur postpartum especially at term. Assess carefully and continue high dependency care for  $\geq 24$  hr
- Continue anti-hypertensive medication after delivery
- If BP falls to  $< 130/80$  mmHg, reduce anti-hypertensive treatment
- **While inpatient** – measure BP  $\geq 4$  times/day

- **If transferred to community** – measure BP every 1–2 days  $\leq$  2 weeks, until anti-hypertensive treatment stopped and no hypertension. Medical team to include management plan for monitoring on discharge documentation
- Persisting hypertension and proteinuria at 6 weeks can indicate renal disease, investigate further
- Be aware of risk of late seizures and review carefully before discharge
- Offer follow-up to discuss events, treatment and future pregnancy care
- **Follow-up at 6 weeks**
- Discuss events, treatment and future pregnancy care
- Check BP and urine. Investigate persisting hypertension and proteinuria at 6 weeks as may indicate renal disease, investigate further

**DRUG TREATMENT REGIMENS**

**LABETALOL**

- Beta-blocker with additional arteriolar vasodilating action

**Labetalol regime on delivery suite**

- Oral therapy 200 mg stat with further 200 mg after 1 hr

Acute treatment (IV)	Maintenance treatment (IV)
<ul style="list-style-type: none"> <li>● 50 mg IV bolus over 1 min (10 mL labetalol 5 mg/mL)</li> <li>● Can be repeated every 5 min to a <b>maximum</b> of 200 mg</li> <li>● Can cause excessive bradycardia reversed by giving atropine sulphate 600 microgram IV</li> </ul>	<ul style="list-style-type: none"> <li>● Where continuous IV doses required, consider insertion of arterial line in discussion with anaesthetist</li> <li>● Neat labetalol 5 mg/mL at a rate of 4 mL/hr via syringe driver</li> <li>● Set target BP and record</li> <li>● Start infusion at 4 mL/hr and double every 30 min to maximum 32 mL/hr (160 mg) until BP lowered and stabilised at acceptable level</li> <li>● Start at:                         <ul style="list-style-type: none"> <li>● 4 mL/hr (double every 30 min if necessary)</li> <li>● 8 mL/hr</li> <li>● 16 mL/hr</li> <li>● 32 mL/hr (maximum)</li> </ul> </li> <li>● Convert to oral therapy – dose dependent on IV dose that was required</li> </ul>

**Common contraindications (see also current BNF)**

- Asthma
- Cardiogenic shock
- AV block

**Cautions**

- Heart failure
- Diabetes

**Side effects**

- Postural hypotension
- Tiredness
- Headache
- Weakness
- Rashes
- Tingling scalp
- Difficult micturation
- Epigastric pain
- Nausea, vomiting

**NIFEDIPINE**

- Calcium-channel blocker, relaxes vascular smooth muscle and dilates coronary and peripheral arteries

**Contraindications**

- Known hypersensitivity
- Gastrointestinal obstruction
- Hepatic impairment
- Inflammatory bowel disease
- Crohn's disease
- Cardiogenic shock

***Concurrent use of magnesium sulphate and nifedipine may cause a precipitous drop in blood pressure***

**Treatment**

- Pre-load with colloid 300 mL IV before administration
- 10 mg capsule orally, repeat every 30 min, up to 3 doses – consider SR tablets for longer-term regulation of BP

***Nifedipine must be swallowed whole – do not give sublingually***

- Monitor fetal heart rate by continuous electronic fetal monitoring (EFM) – see **Electronic fetal monitoring** guideline
- Measure maternal BP every 5 min in first 30 min after initial administration as may reduce quickly

**Side effects**

- Headache
- Flushing
- Dizziness
- Tachycardia
- Palpitation
- May induce exaggerated fall in blood pressure

**HYDRALAZINE**

- Direct acting vasodilator

**Contraindications**

- Known hypersensitivity
- Idiopathic systemic lupus erythematosus
- Severe tachycardia
- High output heart failure
- Myocardial insufficiency due to mechanical obstruction
- Cor pulmonale
- Dissecting aortic aneurysm
- Acute porphyria

**Cautions**

- Renal impairment
- Hepatic impairment
- Ischaemic heart disease
- Cerebrovascular disease

**Side effects**

- Tachycardia
- Palpitations
- Flushing
- Hypotension
- Fluid retention
- Gastrointestinal disturbances
- Headache
- Dizziness
- Rarely: rashes, fever, peripheral neuritis, polyneuritis, paraesthesia, abnormal liver function, agitation, anxiety, dyspnoea

**Hydralazine regimen**

Acute treatment	Maintenance treatment
<ul style="list-style-type: none"> <li>● Consider pre-loading with colloid 300 mL before administration</li> <li>● 5 mg by slow IV bolus diluted with sodium chloride 0.9% 10 mL – can be repeated after 20–30 min – some Trusts prefer to mix 20 mg in 20 mL</li> <li>● Check BP every 5 min for 30 min or until stable at acceptable limit, then every 15 min for further 60 min</li> </ul>	<ul style="list-style-type: none"> <li>● Where continuous IV doses required, consider insertion of arterial line in discussion with anaesthetist</li> <li>● 40 mg in sodium chloride 0.9% 40 mL via syringe driver e.g. 1000 microgram/mL solution</li> <li>● Start infusion at 2 mL/hr</li> <li>● Increase rate in 2 mL/hr increments to a <b>maximum</b> of 20 mL/hr</li> <li>● If pulse &gt;140, consider alternative hypertensive drug</li> <li>● If target BP reached, reduce infusion rate</li> </ul>

**MAGNESIUM SULPHATE 50%**

**Cautions**

- Renal impairment
- Hepatic impairment

**Side effects (generally associated with hypermagnesaemia)**

- Nausea
- Vomiting
- Thirst
- Flushing of skin
- Loss of tendon reflexes
- Muscle weakness
- Hypotension
- Arrhythmias
- Respiratory depression
- Drowsiness
- Confusion
- Coma

**Seizure prophylaxis**

- Administer 2 concentrations:
  - 1 as loading dose
  - 1 as continuous infusion for 24 hr or until 24 hr after delivery (or after last seizure or until diuresis, whichever is later)
- can be stopped without tapering dose

## Magnesium sulphate 50% regimen

Loading dose	Maintenance dose	Dose for recurrent seizures
<ul style="list-style-type: none"> <li>● 4 g IV</li> <li>● Add magnesium sulphate 50% 8 mL (4 g) to sodium chloride 0.9% 12 mL – total volume 20 mL</li> <li>● Administer via syringe driver over 10–20 min (infusion rate of 60–120 mL/hr)</li> </ul>	<ul style="list-style-type: none"> <li>● 1 g/hr IV</li> <li>● Add magnesium sulphate 50% 10 mL (5 g) to sodium chloride 0.9% 40 mL – total volume 50 mL</li> <li>● 10 mL = 1 g magnesium sulphate</li> <li>● Start IV infusion via syringe driver at 10 mL/hr</li> </ul>	<ul style="list-style-type: none"> <li>● Give 2 g bolus for weight &lt;70 kg</li> <li>● Add magnesium sulphate 50% 4 mL (2 g) to sodium chloride 0.9% 12 mL and administer by slow bolus injection over 5–10 min</li> <li>● Give 4 g bolus for weight &gt;70 kg</li> <li>● Add magnesium sulphate 50% 8 mL (4 g) to sodium chloride 0.9% 12 mL and administer by slow bolus injection over 5–10 min</li> <li>● Increase maintenance dose to 2 g/hr IV</li> </ul>

## Observations

- Continuous pulse oximetry
- Urine output hourly
- Respiratory rate hourly
- Deep tendon reflexes
- Monitor insertion site closely for phlebitis using a recognised infusion phlebitis scoring tool

## Check serum magnesium levels

**Stop magnesium sulphate if:**

- Urine output <100 mL in 4 hr
- Respiratory rate  $\leq$  12 breaths/min
- Oxygen saturation <90%
- Patellar reflexes absent (not due to regional anaesthesia)

**97% of magnesium is excreted in urine. Oliguria can lead to toxicity.**  
**Antidote – calcium gluconate 10%  
 10 mL IV over 10 min**

## DEFINITION

Prolonged head to body delivery time requiring additional obstetric manoeuvres to release shoulders from behind mother's pubic bone or, less commonly, sacral promontory

## RISK FACTORS

- If identified, middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) to be on delivery suite at delivery or
- in delivery room for women with previous shoulder dystocia
- No evidence to suggest that prophylactic McRoberts position will be of any benefit before delivery of fetal head

## Antepartum

### Maternal

- Maternal obesity – body mass index >30 kg/m<sup>2</sup> [see **Obese mother (care of)** guideline]
- Excessive weight gain
- Previous big baby
- Previous shoulder dystocia
- Maternal diabetes mellitus – even in absence of fetal macrosomia

### Fetal

- Suspected or confirmed fetal macrosomia
- Post-dated pregnancy

## Intrapartum

- Prolonged first or second stage
- Oxytocic augmentation
- Assisted delivery
- Signs in second stage:
  - difficulty with delivery of face and chin
  - head remaining tightly applied to vulva or even retracting (turtle-neck sign)
  - failure of restitution of fetal head
  - failure of shoulders to descend

**Notify middle grade obstetrician of any second stage risk factors**

## MANAGEMENT

### Immediate action

- Sound emergency call bell/buzzer and summon:
  - delivery suite co-ordinator
  - middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant
  - neonatal team member (as per local practice)
  - anaesthetist
  - theatre staff
- Quickly tell mother what is happening, reassure her
- Nominate a member of staff to document events

### Position woman and traction

- Position mother with buttocks at end of bed lying flat
- Mother's legs flexed, abducted and rotated outwards (McRoberts manoeuvre) and attempt delivery using routine axial traction

**To reduce risk of brachial plexus injury, use axial traction only**

- Instruct mother not to push as may cause further impaction of the shoulders
- Do not apply fundal pressure (associated with a high neonatal complication rate and may result in uterine rupture)

### Suprapubic pressure

- If delivery not successful with McRoberts manoeuvre alone, ask assistant to apply suprapubic pressure for 30 sec with heel of hand over posterior aspect of shoulder – **assistant must be aware of position of fetal back to ensure pressure applied in the right direction**
- if continuous pressure not successful, attempt a rocking movement as there is no clear difference in efficacy between continuous pressure and rocking movement
- if shoulder disimpacted, encourage mother to push and attempt delivery

### Subsequent management

- If delivery unsuccessful, performing clinician should attempt either of the 2 manoeuvres **below** independently to attempt rotation of the shoulders
- base decision on which manoeuvre to use first on training and clinical expertise, and clinical circumstances
- if first fails try second manoeuvre
- Perform episiotomy to facilitate access

### Delivery of posterior arm

- Attempt delivery of posterior arm and shoulder:
- introduce hand into pelvis posteriorly at 5 o'clock or 7 o'clock, with palm facing baby's face
- find posterior shoulder and using 2 fingers follow arm and flex elbow to the chest
- grasp the fetal wrist and gently withdraw posterior arm from the vagina, sweeping across chest and face in a straight line

### Rotational manoeuvre

#### Wood's screw/Rubin II manoeuvre

- Insert hand into vagina and approach posterior shoulder from **front** of fetus, aiming to rotate shoulder towards symphysis pubis
- Insert fingers of opposite hand **behind** anterior shoulder, pushing shoulder towards the chest
- combination of these 2 manoeuvres frees the impacted shoulders and allows delivery
- If unsuccessful, consider reverse Wood's screw manoeuvre

#### Reverse Wood's screw manoeuvre

- Insert hand into vagina and approach posterior shoulder from **behind** the fetus in an attempt to rotate in opposite direction to the original Wood's screw. If successful, the shoulders will rotate 180° in the opposite direction and then deliver

### Above actions unsuccessful

- Position mother on all-fours (Gaskin manoeuvre) and attempt delivery of posterior shoulder repeating above manoeuvres
- When all above manoeuvres have been attempted, choose either the Zavenelli manoeuvre or symphysiotomy

### Zavenelli manoeuvre

- A middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant may use the Zavenelli manoeuvre: rotation, flexion and reinsertion of fetal head into vagina, followed by emergency caesarean section

### Symphysiotomy

- Syphysiotomy: **attempt as a last resort** and only by, or in the presence of consultant obstetrician
- insert a urethral catheter to move urethra to one side, make a midline incision in symphyseal joint and perform delivery
- to avoid sudden abduction, ensure mother's legs are supported at all times

### AFTER DELIVERY

- Hand baby to waiting neonatal team member who will perform resuscitation where required – see **Cardiopulmonary resuscitation of the newborn** guideline
- Delivering midwife/medical staff will perform active management of the third stage
- inspect genital tract thoroughly and repair
- ensure adequate analgesia prescribed and antibiotics and/or laxatives if indicated, see **Perineal trauma suturing (tears and episiotomy)** guideline
- Perform maternal observations and estimation of blood loss

- In all cases of shoulder dystocia, obtain paired cord blood for gases – see **Umbilical cord sampling** guideline
- If baby well, encourage a period of skin-to-skin contact

### Documentation

- In all cases of shoulder dystocia, regardless of outcome, midwife or doctor responsible for mother's care should:
  - complete a shoulder dystocia checklist and place 1 copy in maternal healthcare record
  - record which shoulder was anterior at delivery
  - follow local adverse incident/near miss reporting procedure

### Communication with parents/family

- Obstetrician and midwife must discuss events with woman/family and document discussion in maternal healthcare record

### Examination of baby

- Neonatal team member who was present at delivery will carry out a detailed initial examination – see Staffordshire, Shropshire & Black Country Newborn and Maternity Network **Examination of the newborn** guideline (if used locally), paying particular attention to the arms for the presence of swelling, bruising, tone, posture and movement. If concerns, X-ray of affected side – arm and clavicle
- **No movement noted** – inform neonatal consultant on duty and refer to surgeons for review and investigation of possible brachial plexus injury – see Staffordshire, Shropshire & Black Country Newborn and Maternity Network **Upper limb birth injuries** guideline
- **Some restricted movement noted** – refer to physiotherapy and arrange outpatient follow-up

- **Baby appears well** – transfer to postnatal ward with mother. Full neonatal assessment will take place, and findings documented in maternal healthcare record, before discharge from hospital

### Transfer to postnatal ward

- When transferring mother and baby to postnatal ward, follow local practice and ensure all events communicated to postnatal ward midwives
- Obstetrician involved in the shoulder dystocia will:
  - visit woman and family on postnatal ward the following day to discuss events in detail
  - if appropriate speak to other healthcare professionals involved e.g. neonatologist or midwife

### Deterioration in baby's condition

- If, at any time, midwifery staff in hospital or community detect deterioration in baby's condition, refer to neonatal team

### In hospital

- Contact neonatal junior doctor and/or middle grade depending on severity of problem

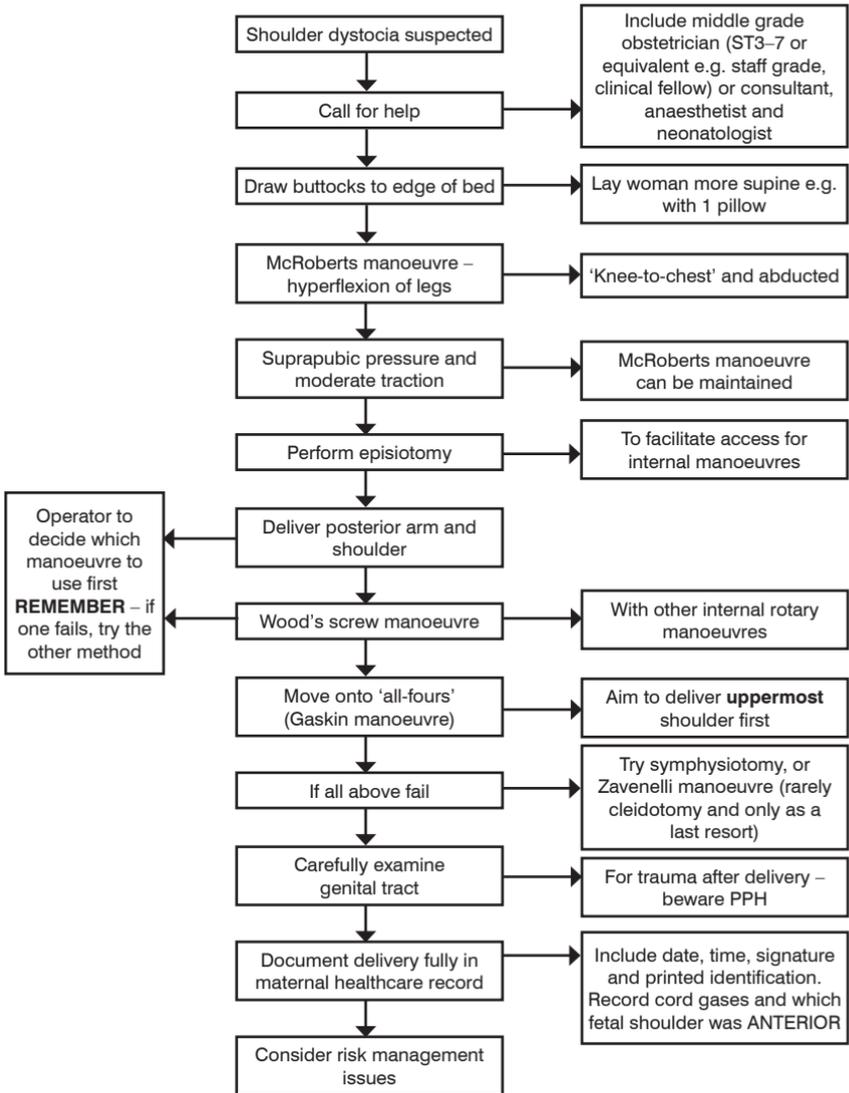
### In the community

- Contact woman's GP/paediatric assessment unit or A&E department depending on severity of problem
- For babies with a history of shoulder dystocia, follow local incident reporting policy for re-admission

### DISCHARGE AND FOLLOW-UP

- Neonatal staff will discuss ongoing care with parents/family before discharge

Algorithm: Management of shoulder dystocia (MOET course manual 2007)



### INTRODUCTION

- Some Trusts do not support commercial stem cell collection
- If your Trust is not licensed for the collection of cord blood collection for commercial or non-commercial reasons must be performed under a third party agreement with a Human Tissue Authority licensed establishment
- The professional collecting cord blood must be appropriately trained to ensure an uncontaminated sample that is safe to use
- Fetal wellbeing takes priority. If compromised for any reason, stem cell collection will be delayed or, in some circumstances, not possible
- Umbilical cord collection must not interfere with the care of mother or baby
- Do not delay mother and baby skin-to-skin contact

***If a family wishes to undergo umbilical cord blood collection, discussion must take place as early in the antenatal period as possible to allow time for necessary arrangements***

- Cord blood collection is particularly unlikely to be possible in the following circumstances:
  - prematurity
  - nuchal cord
  - multiple pregnancy
  - emergency caesarean section
  - postpartum haemorrhage

### COMMERCIAL BLOOD COLLECTION

- If woman is interested in commercial cord blood collection, advise her that collection for commercial storage is not permitted on most NHS Trust premises unless there is a private arrangement with a company licenced under Regulation 7 (1) and Schedule 2 of the Human Tissue (quality and safety for human application) Regulations 2007
- Woman is responsible for this private arrangement. She will inform her community midwife of her plan
- Community midwife or other maternity professional will inform midwifery manager according to local protocols and document in maternal healthcare record
- The company will confirm the plan in writing for the woman. File this in the maternal healthcare record
- Woman's birth partner will contact the private phlebotomist to arrange stem cell collection following birth
- Midwives or doctors must never, in any circumstances, be involved in the collection of cord blood for commercial stem cell storage
- The company accepts liability for failed sample. Therefore, the Trust does not have legal responsibility or liability for samples taken on their premises

### NON-COMMERCIAL BLOOD COLLECTION

- Umbilical cord blood may be collected via a third party agreement with a Human Tissue Authority licensed establishment. Collection may have been recommended where family members have:
  - haemoglobinopathies
  - acute inherited disorders
  - acute lymphoblastic leukaemia
- In general, those caring for the family member with the haematological disorder have provided third party agreement for cord blood collection. They also have the responsibility to provide training and clear instructions for staff
- The National Blood Service in Birmingham (if involved) provides 2 collection packs containing instructions and contact details. 1 pack is for staff (most likely to be present when collection occurs) to open and familiarise themselves with before delivery. **Do not open** the second pack until cord blood collection is about to be performed
- Store the cool packs in a refrigerator at 4°C until required – **do not freeze**
- In addition to the collection packs, ensure the following equipment is available:
  - Spencer Wells clamps
  - scissors
  - swabs, spray and gauze for cord disinfection before venepuncture

### Collection

- See NHS Blood and Transplant Service <http://www.nhsbt.nhs.uk/>

### INTRODUCTION

- Maternal drug use in pregnancy increases perinatal mortality and morbidity with an increased risk of placental abruption, fetal growth restriction etc.
- Many drugs (opiates, benzodiazepines) can cause severe neonatal withdrawal symptoms
- Substance misuse can lead to poor maternal health e.g. infective endocarditis, VTE and blood borne viruses

### ANTENATAL CARE

- Initial contact between woman and maternity services is likely to influence their subsequent uptake of care. Non-judgmental care from maternity unit staff encourages regular attendance, which in turn improves antenatal care, detection of fetal growth restriction, neonatal care, communication between members of the multi-agency team, and discharge planning
- Whilst respecting privacy and confidentiality, routinely record problem drug or alcohol use at booking risk assessment

### Booking

- For women who disclose substance misuse:
- book under consultant care to facilitate planning of maternity, neonatal and social care within a multidisciplinary team
- inform specialist midwife, if available locally

### Specialist midwife/drug worker will

- Discuss neonatal abstinence syndrome and plan of care with woman and appropriate family members
- Initiate child safeguarding procedure

- Encourage women using opiates who are not already in a drug treatment programme, to accept referral to specialist services for:
  - a full assessment of substance usage
  - drug screening (to confirm present usage)
  - ongoing counselling
  - support in stabilising usage through substitute prescribing (e.g. methadone)
  - thorough assessment of woman's social circumstances to decide appropriate referral (e.g. social care and health planning)
- Record and discuss with community midwife
- Refer woman to appropriate professionals

### Documentation and confidentiality

- Be aware – although the maternal hand-held record is marked 'confidential', anything written can be read by others. Before recording explicit details of substance misuse in this record, ensure woman agrees to their inclusion

### Domestic abuse

- Staff should be aware that substance misuse may be associated with current or past experiences of abuse. Domestic abuse often escalates during pregnancy
- As a minimum, ensure routine enquiries about domestic abuse are made at booking
- Whenever possible, woman should be seen alone at least once during the antenatal period to enable disclosure

### Screening for blood-borne viruses

- In addition to routine hepatitis B and HIV screening, advise routine hepatitis C screening

### Hepatitis B and C

- See **Hepatitis** guideline

### HIV

- See **HIV positive women** guideline

**Plan of antenatal care**

<b>Gestation</b>	<b>Action</b>
At first disclosure	<ul style="list-style-type: none"> <li>● Consultant-led antenatal clinic</li> <li>● Complete common assessment framework (CAF) form (if used locally)</li> <li>● Liaise with specialist midwife, if available locally</li> </ul>
Booking	<ul style="list-style-type: none"> <li>● Find out which substances are being used and in what quantities</li> <li>● Arrange following tests:                             <ul style="list-style-type: none"> <li>● booking bloods</li> <li>● hepatitis C</li> <li>● dating scan</li> </ul> </li> <li>● Discuss serum screening for Down syndrome</li> <li>● Ensure follow-up with specialist drug workers</li> <li>● Offer smoking cessation referral</li> <li>● Initiate neonatal alert process in line with local practice</li> <li>● Plan subsequent antenatal visits with community midwife/antenatal clinic</li> </ul>
18–23 weeks	<ul style="list-style-type: none"> <li>● Anomaly scan</li> </ul>
Third trimester	<ul style="list-style-type: none"> <li>● Growth scan (according to local policy)</li> <li>● Repeat bloods</li> <li>● Ensure pre-birth plan in place, if appropriate</li> <li>● Review plan of care for baby</li> </ul>
41 weeks	<ul style="list-style-type: none"> <li>● Induction of labour for obstetric reasons</li> </ul>

**Non-booked women**

- On admission, women who have not engaged with maternity services (who deliver within the Trust) require:
  - urgent screening for blood-borne viruses
  - detailed multi-agency discharge planning
  - referral to social services (via CAF form if used locally)

**DNAs**

- See local protocol for follow-up of women who do not attend scheduled antenatal clinical appointments
- Ensure specialist drug worker or team is informed of woman's failure to attend. They may be able to encourage attendance by engaging with her in a non-hospital setting

- If woman persistently fails to attend booked antenatal clinic appointments, refer to specialist midwife, if available locally

**CANNABIS MISUSE**

- Cannabis can be taken orally or smoked with tobacco

**Risks**

- Smoking tobacco can cause fetal growth restriction, preterm labour, stillbirth and sudden infant death. Encourage smoking cessation

**Action**

- Follow local policy

### ALCOHOL MISUSE

- Consuming alcohol during pregnancy can damage the fetus. Explain the risks and advise woman to avoid alcohol consumption (including binge-drinking in early pregnancy)
- Ask woman about alcohol intake during pregnancy, but be aware of under-reporting and underestimating their true intake

#### Action

- If woman is drinking heavily, stopping suddenly may be hazardous to her and the baby – seek specialist advice and referral
- Check booking liver function tests and consider liver scan if markedly abnormal
- Fetal anomaly scan
- Growth scan as local policy
- The use of Antabuse® (disulfiram) is contraindicated in pregnancy and breastfeeding

### OPIATE MISUSE

#### Action

- Encourage woman to enter into an opiate maintenance programme [methadone or buprenorphine (Subutex®)] with drug treatment services
- Consider increasing methadone/ Subutex® dose in third trimester (plasma concentrations may decrease as gestation increases). Increase will need to be reversed in the postpartum period (if mother is highly motivated)

### BENZODIAZEPINES (DIAZEPAM, TEMAZEPAM) MISUSE

- Benzodiazepine misuse is commonly associated with other substance misuse. Maternal benzodiazepine dependence is associated with neonatal abstinence syndrome, sometimes prolonged, but is not associated with other adverse pregnancy outcomes
- Avoid abrupt withdrawal – sudden withdrawal from benzodiazepines can precipitate severe anxiety, hallucinations and seizures

### ADMISSION AND MATERNAL INPATIENT CARE

#### On admission to maternity unit

- For any planned admission, ensure clear plan to prescribe appropriate dose opiate replacement
- involving service provider of prescription and community pharmacy where woman is obtaining opiate replacement therapy
- If admitted as an emergency, inform specialist drug worker/team who can advise on dose of opiate replacement. If unavailable, consultant obstetrician to decide appropriate opiate replacement dosage (follow local policy to ascertain usual dosage)
- timing of administration of opiate replacement should follow woman's normal pattern
- do not prescribe methadone to a woman not on a replacement programme, await referral to drug team
- **Do not** prescribe opiate replacement therapy to take home – arrange supply to be available from woman's usual source

**Labour and pain relief**

- Inform specialist drug worker/team
- Give usual dose of methadone during labour at the regular time, although this will not be adequate for pain relief in labour
- If woman Subutex® (buprenorphine) user, adequate pain relief can be difficult as it can reduce the effects of opioid analgesics
- Standard opiate analgesia can safely be given
- Morphine and pethidine may be inadequate for pain relief; regional analgesia may be preferable – involve on-call anaesthetist early
- In women with a history of intravenous drug use, review venous access. Consider asking anaesthetist to insert a cannula early if difficulty anticipated
- Inform neonatologists when delivery imminent. It is not necessary for them to attend routinely unless there are other indications

**DO NOT GIVE naloxone to baby as there is a major risk of respiratory depression and seizures**

**POSTNATAL CARE**

**Neonatal abstinence syndrome**

- See Staffordshire, Shropshire & Black Country Newborn Network **Abstinence syndrome** guideline (if used locally)

**Baby**

- Encourage breastfeeding
- Be aware of:
  - late neonatal abstinence syndrome (> 72 hr)
  - benzodiazepines have longer withdrawal period
- Advise mothers of neonatal abstinence syndrome symptoms and signs
- Give contact number for community midwife and provide a means for mother and baby to return if worried (fast track, symptom awareness)
- Arrange community midwife visit
- Arrange follow-up clinic appointment. Duration and frequency of follow-up will be individualised

**Mother**

- Inform woman's specialist drug worker of discharge
- Multi-professional meeting with social care and health plan
- Ensure prescriptions in place in the community (especially if discharged before a weekend)

# THIRD AND FOURTH DEGREE PERINEAL TEARS – OASIS (OBSTETRIC ANAL SPHINCTER INJURIES) • 1/2

## CLASSIFICATION

### Third degree tear

- Injury to perineum involving the anal sphincter complex:
- 3a: <50% of external anal sphincter (EAS) thickness torn
- 3b: >50% of EAS thickness torn
- 3c: EAS and internal anal sphincter (IAS) torn

### Fourth degree tear

- Injury to perineum involving anal sphincter complex (EAS and IAS) and anal epithelium

*If tear involved anal mucosa only with intact anal sphincter complex (buttonhole tear), document as a separate entity*

*If not detected and repaired, this type of tear may result in a recto-vaginal fistula*

## RISK FACTORS

- Forceps delivery
- Second stage >1 hr
- Shoulder dystocia
- Nulliparity
- Persistent occipitoposterior position
- Midline episiotomy
- Birth weight >4 kg
- Induction of labour
- Asian ethnicity

## ASSESSMENT OF PERINEAL TRAUMA

- See also **Perineal trauma suturing (tears and episiotomy)** guideline
- Systematically examine women who sustain genital tract trauma during vaginal birth to assess severity of damage, include:
- rectal examination to exclude damage to sphincter complex (external and internal anal sphincters and rectal mucosa)

*Informed verbal consent must be obtained before performing rectal examination*

- If practitioner inexperienced in assessing perineal damage or unsure of degree of trauma sustained, seek second opinion

## Documentation

- Clearly document in mother's healthcare record:
- examination findings, using agreed classification above
- if rectal examination performed as part of initial assessment before suturing
- if rectal examination was not carried out and reasons for not doing so

## PRINCIPLES OF REPAIR

*Obstetric anal sphincter repair to be performed only by an appropriately trained, competent practitioner*

*Practitioners who have not been assessed as competent must be supervised by an experienced clinician*

## Technique and position of woman

*Use aseptic technique at all stages of procedure*

- Suture as soon as possible following delivery, ideally  $\leq 1$  hr, to reduce bleeding and risk of infection
- Obtain written informed consent before undertaking repair
- Perform rectal examination before suturing to assess the integrity of the rectal mucosa and confirm extent of damage
- Perform repair, in theatre, with mother in lithotomy position using good lighting
- Use regional or general anaesthesia (to allow relaxation of anal sphincter to enable torn ends to be brought together without tension)
- Follow local antibiotics prescribing policy
- Depending on full extent of injury, perform repair to anal sphincter complex in following sequence

## THIRD AND FOURTH DEGREE PERINEAL TEARS – OASIS (OBSTETRIC ANAL SPHINCTER INJURIES) • 2/2

### Rectal mucosa

- Use interrupted or continuous sutures with 3–0 Vicryl Rapide™ or equivalent on round bodied needle

### Internal anal sphincter (IAS)

- Use interrupted mattress sutures using 3–0 PDS® or equivalent on round bodied needle or 2–0 Polysorb™ or equivalent on round bodied needle

### External anal sphincter (EAS)

- Identify torn ends of the EAS and apply Allis tissue forceps
- Repair using either an overlap or end-to-end approximation technique with either 3–0 PDS® round bodied needle or 3–0 Vicryl™ or equivalent on round bodied needle
- If overlap technique used it may be necessary to dissect the EAS to facilitate this (remember not to over-dissect as this may cause pudendal nerve damage)



Overlap method      End-end method

### Vagina, perineal muscles and skin

- Identify apex of vaginal mucosa and place first stitch slightly beyond it
- Repair vaginal wall tissues with a continuous non-locking stitch
- Repair deeper perineal muscles using a continuous suture, closing the skin with a continuous subcutaneous suture using 3–0 Vicryl™ or equivalent Rapide™ on taper cut needle
- Following completion of repair, carry out rectal examination to ensure sutures **have not** been placed through the rectal mucosa

### POST-OPERATIVE MANAGEMENT

- Insert an indwelling Foley catheter and leave *in situ* in accordance with local practice

### Laxatives

- Lactulose 10 mL 8-hrly for 10 days

### Analgesia

- Diclonfenac 100 mg PR 8-hrly (check not allergic to NSAID or any other contraindications)
- Appropriate non-codeine based oral analgesia e.g. paracetamol

### Oral antibiotics

- Follow local antibiotic prescribing policy

### DOCUMENTATION

*In cases of obstetric anal sphincter injury, follow local risk management procedure and document in medical record*

- The following must be documented:
  - classification of injury including anatomical structures involved
  - method of repair and suture materials used
  - anaesthetic used
  - if rectal examination carried out following repair and verbal consent obtained
  - estimated blood loss
  - instruments, sharps and swabs accounted for, including names of those checking
  - whether woman fully informed about the nature of her injury
  - appropriate information given to the woman – extent of trauma, diet, perineal hygiene, pelvic floor exercises and follow-up arrangements

### DISCHARGE AND FOLLOW-UP

- Give woman instructions on pelvic floor exercises, diet, hygiene and pain relief
- Arrange review appointment at 6–12 weeks postpartum – if available, in perineal care clinic, otherwise follow local practice
- If available locally, provide patient information leaflet

### DEFINITION

Time from birth of baby to expulsion of placenta and membranes and control of bleeding

### Information for woman

Inform woman in the antenatal period, that active management of third stage shortens its duration and reduces risk of postpartum haemorrhage (PPH). However, women at low risk of PPH and who request a physiological third stage should be supported in their choice

### ACTIVE MANAGEMENT

- Care package including:
  - routine use of uterotonic drugs – oxytocin alone (Syntocinon® 10 units IM or 5 units by slow IV bolus), or with ergometrine (Syntometrine®)
  - **do not give Syntometrine® to a woman who has been hypertensive or whose blood pressure has not been checked since admission**
  - clamping and cutting of cord, after  $\geq 1$  min for a healthy term infant to allow placental fetal transfusion to occur
  - controlled cord traction (CCT) after signs of separation

### PHYSIOLOGICAL MANAGEMENT

- Care package including:
  - no uterotonic drugs
  - encourage skin-to-skin contact and early breastfeeding
  - no clamping and cutting of cord until pulsation has ceased
  - placenta delivered by maternal effort and gravity
- Do not pull cord or palpate uterus
- if delivery of placenta required owing to bleeding or delay or if requested by woman, administer a uterotonic drug as part of active management

*Third stage is prolonged if not completed  $\leq 30$  min with active management and 60 min with physiological management – see Retained placenta guideline*

### OBSERVATIONS

- Observe and record at least once after delivery:
  - temperature
  - pulse
  - blood pressure
  - respiratory rate

### ASSESS

- General physical condition
- Maternal colour
- Uterine tone
- Blood loss
- Is bladder empty? See **Bladder care** guideline
- Emotional/psychological condition

### EXAMINE

- When delivered:
  - cord
  - placenta
  - membranes
  - perineum – see **Perineal trauma suturing (tears and episiotomy)** guideline
- Take umbilical cord blood sample for gases (see **Umbilical cord sampling** guideline) and for haemolytic disease of the newborn (HDN) testing if required

### COMPLICATIONS

- In postpartum haemorrhage, emergency action is required – see **Postpartum haemorrhage** guideline
- See also, **Third and fourth degree perineal tears – OASIS** guideline, **Collapse** guideline and **Retained placenta** guideline

### INTRODUCTION

- In randomised clinical trials, transcervical catheter induction has been shown to be safe and effective in inducing labour in women with an unfavourable cervical score
- Its aim is to gradually dilate the cervix by gentle and constant pressure of the catheter balloon at the level of the cervix

### INDICATIONS

- Unfavourable cervix requiring induction of labour where artificial rupture of membranes (ARM) is not possible
- Previous caesarean section (CS)
- Failed attempt at prostaglandin induction

### CONTRAINDICATIONS

- Ruptured membranes

### METHOD

#### Consent

- Discuss procedure with woman and obtain and document verbal consent

#### Equipment

- Foley balloon catheter 30 mL balloon or Cook® cervical ripening balloon catheter
- both are effective but the Foley catheter is cheaper and has a shorter placement-to-delivery interval
- Instillagel® (local anaesthetic and antiseptic)
- Sterile vaginal examination pack
- Sterile Cusco speculum
- Sponge-holding forceps (Rampley)
- Entonox
- Antiseptic solution
- sterile water or sodium chloride 0.9% 100 mL

### Procedure

- Ensure woman's bladder is empty and transfer to delivery suite
- Insert Instillagel® into vagina 5–10 min before procedure to reduce discomfort when manipulating cervix. Entonox should be available
- Place woman in lithotomy position
- Clean vulva with antiseptic solution
- It may be necessary to gently grasp the anterior cervical lip with sponge-holding forceps to achieve a good view and facilitate procedure. This can be uncomfortable and should not be done routinely

#### Foley catheter

- Hold (do not clamp) catheter with Rampley's forceps 1–3 cm (i.e. measured cervical length from vaginal examination) from end of balloon area
- Advance into the cervical canal until 1–3 cm below the balloon area has entered the canal and inflate balloon with sterile water or sodium chloride 0.9% 30 mL
- Gently pull catheter back to ensure balloon is resting at the internal cervical os
- Apply a spigot to the catheter and tape catheter to the thigh under gentle tension

#### Cook® catheter

- Pass catheter through cervix until both balloons have entered cervix
- Inflate the intrauterine (red) balloon with sterile water or sodium chloride 0.9% 40 mL
- Pull catheter back until balloon is against the internal os
- Fill the visible vaginal (green) balloon with sterile water or sodium chloride 0.9% 20 mL

### Post-insertion

- Perform electronic fetal monitoring. See **Electronic fetal monitoring** guideline
- Observe for signs and symptoms of labour, spontaneous expulsion of balloon, ruptured membranes, febrile symptoms, pain and vaginal bleeding
- If catheter has not been passed vaginally (12 hr for Cook® or 18 hr for Foley), remove
- Middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant will decide whether ARM is possible. If not, options include a further attempt or CS

*All staff involved in maternity care should receive at least annual training in the management of obstetric emergencies including umbilical cord prolapse*

### DEFINITION

Descent of umbilical cord through cervix alongside (occult) or past presenting part (overt) in the presence of ruptured membranes

### Background

- Incidence of cord prolapse is between 0.1–0.6%
- 50% of cases are preceded by obstetric manipulation
- Cord prolapse carries a perinatal mortality rate of 91/1000
- in hospital settings, mortality is largely secondary to prematurity and congenital malformations
- Cord prolapse is also associated with birth asphyxia
- asphyxia, predominantly caused by cord compression and umbilical arterial vasospasm, can result in long-term morbidity because of hypoxic ischaemic encephalopathy

## RECOGNITION AND ASSESSMENT

### Symptoms and signs

- Cord presentation and prolapse may occur with no outward physical signs and with a normal fetal heart rate (FHR) pattern
- Abnormal fetal heart rate pattern (e.g. bradycardia, variable decelerations, prolonged deceleration of >1 min – particularly if soon after membrane rupture)
- Cord seen or felt at vaginal examination

### Investigations

- Auscultate fetal heart soon after rupture of membranes
- Routine vaginal examination is **not** indicated if liquor clear with spontaneous rupture of membranes in the presence of normal FHR and absence of risk factors

### Cord prolapse suspected

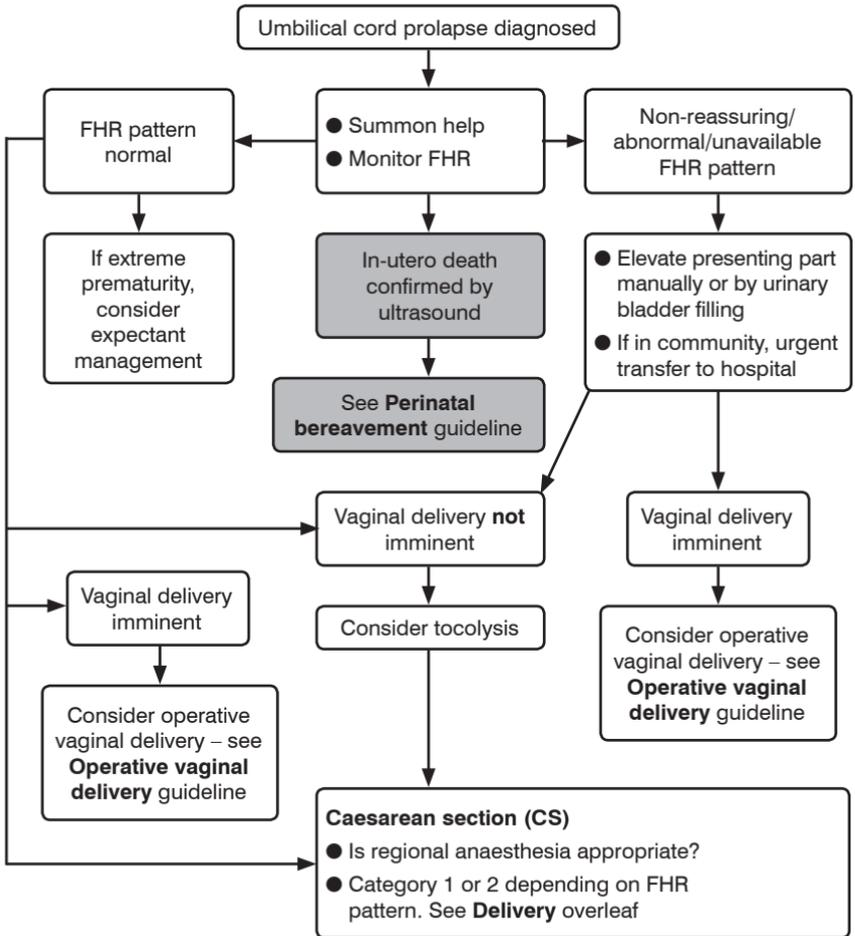
- Suspect where there is an abnormal FHR pattern (e.g. bradycardia, variable decelerations), particularly if such changes occur soon after membrane rupture, spontaneously or with amniotomy
- Perform speculum and/or digital vaginal examination (even at preterm gestation)
- Do **not** perform ultrasound examination to predict increased probability of cord prolapse

### Risk factors associated with cord prolapse

General risk factors	Procedure related
<ul style="list-style-type: none"> <li>● Low birth weight (&lt;2.5 kg)</li> <li>● Prematurity (&lt;37 weeks)</li> <li>● Fetal congenital anomalies</li> <li>● Breech presentation</li> <li>● Transverse, oblique and unstable lie</li> <li>● Second twin</li> <li>● Polyhydramnios</li> <li>● Unengaged presenting part</li> <li>● Low-lying placenta, other abnormal placentation</li> </ul>	<ul style="list-style-type: none"> <li>● Artificial rupture of membranes</li> <li>● Vaginal manipulation of fetus with ruptured membranes</li> <li>● External cephalic version (during procedure)</li> <li>● Internal podalic version</li> <li>● Stabilising induction of labour</li> </ul>

**IMMEDIATE TREATMENT**

Follow **Flowchart** and **General principles** below



### General principles

- To prevent vasospasm, minimise handling of loops of cord lying outside vagina
- Manual replacement of prolapsed cord above presenting part is not recommended
- Wrapping cord in swabs soaked in warm sodium chloride 0.9% is of **no** proven benefit
- Attempt to prevent cord compression by:

### Manual elevation of presenting part

#### Contraindications

- Procedure resulting in unnecessary delay in delivery

#### Procedure

- Insert gloved hand or 2 fingers into vagina and apply pressure to presenting part pushing it upwards
- Variation is to remove hand from vagina once presenting part above pelvic brim, and apply suprapubic pressure upwards

#### Complications

- Excessive displacement of presenting part may result in more cord prolapsing

### Bladder filling to elevate presenting part

#### Indications

- Decision-to-delivery interval likely to be prolonged and/or involve ambulance transfer

#### Contraindications

- Procedure resulting in unnecessary delay in delivery

#### Procedure

- Catheterise woman with appropriate Foley catheter
- Insert end of a blood-giving set into end of Foley catheter and, once sodium chloride 0.9% 500–750 mL instilled, clamp catheter

- Empty bladder just before any delivery attempt
- woman adopting knee-chest position or head-down tilt (preferably in left-lateral position)
- While preparing for caesarean section, consider tocolysis if FHR abnormalities persist after attempts to prevent compression and when delivery is likely to be delayed
- do **not** allow above to cause unnecessary delay

### Gestational age at the limits of viability

- In cases of cord prolapse complicating pregnancies with gestational age at the limits of viability:
- counsel mother on continuation and termination of pregnancy

### Delivery

- When vaginal delivery **not** imminent, CS
- **Category 1** (CS performed with the aim of delivering within  $\leq 30$  min) if cord prolapse associated with suspicious or pathological FHR pattern – providing maternal safety is not unduly compromised
- **Category 2** if FHR pattern normal
- If vaginal birth imminent, vaginal birth is preferable to CS
- if quick and safe delivery anticipated, attempt vaginal birth (in most cases operative) at full dilatation
- In some circumstances (e.g. internal podalic version for a second twin) breech extraction may be performed
- Cord blood samples for pH and base excess measurement – see **Umbilical cord sampling** guideline

### SUBSEQUENT MANAGEMENT

- Offer mother postnatal debriefing
- Follow local clinical incident reporting procedure

# UMBILICAL CORD SAMPLING • 1/1

Although sometimes difficult to obtain, both arterial and venous blood samples are required to make a more accurate assessment of condition of the baby

## INDICATIONS

### May include

- Baby born in poor condition – Apgar score of <7 at 5 min
- Non-reassuring or abnormal electronic fetal monitoring (EFM) trace
- Shoulder dystocia
- Instrumental delivery
- Caesarean section – elective (if local practice) and emergency
- Fetal blood sample is taken during labour
- Premature delivery
- Vaginal breech delivery
- Maternal pyrexia in labour
- Multiple pregnancy
- Medical conditions, including ITP, as per plans made in antenatal period (cord FBC)

## PROCEDURE

### Timing

- Collect samples ideally  $\leq 30$  min following delivery
- blood will not normally clot while still in cord
- sampling  $\leq 30$  min with cord stored at room temperature and taken with a good technique will provide most reliable results
- If delay of  $> 30$  min anticipated, refrigerate section of cord and sample within 1 hr – results from sampling after this time will be unreliable

## Method

- Once baby separated from placenta, isolate and double clamp section of cord selected for sampling as soon as possible
- Insert needle at 30° angle to vessel to ensure sampling from single vessel
- For best results, fill 2 mL pre-heparinised syringe. Ensure all air bubbles expelled, and syringe is capped and not left open-ended
- Obtain sample from both artery and vein

## Results

- Analyse in blood gas analyser
- difference  $\geq 0.03$  units indicates both arterial and venous blood obtained
- Secure results in intrapartum notes. As a minimum, document cord pH and base excess in maternal healthcare record

## Action

- Inform neonatal team if low cord pH
- Inform postnatal ward on transfer of any low pH and high base excess obtained from blood analysis, even if baby in good condition
- Babies born with cord pH levels  $< 7.0$  – follow local incident reporting procedure

### DEFINITION

#### Uterine rupture

- Separation of uterine muscle requiring operative intervention or is symptomatic. Involves full thickness of the uterine wall
- uterine rupture is most often seen in women with a scarred uterus [usually from a previous caesarean section (CS)]
- risk is increased by the use of oxytocin and more so with prostaglandins
- uterine rupture can occur in women who have not had uterine surgery
- can be life-threatening

#### Dehiscence

- Scar starts to separate, but mother and baby are not affected. No symptoms are evident. Dehiscence is noted at repeat CS

### RECOGNITION AND ASSESSMENT

- If any of the following occur in a woman with a scarred uterus, call middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) or consultant obstetrician to review woman urgently

#### Symptoms and signs of scar rupture

- Abnormal electronic fetal monitoring (EFM) trace
- Acute onset of scar tenderness
- Severe abdominal pain especially if between contractions
- Breakthrough pain during epidural analgesia
- Chest or shoulder tip pain, or sudden onset of shortness of breath
- Vaginal bleeding or haematuria
- Maternal tachycardia, hypertension or shock

- Undue maternal distress, agitation
- Cessation of previously efficient uterine activity
- Loss of station of presenting part

### IMMEDIATE MANAGEMENT

#### Scar rupture suspected

##### General

- Ensure maternal resuscitation is managed effectively
- Stop oxytocin if in progress
- Administer oxygen at maximum flow
- Crossmatch 4 units of blood urgently
- Insert a second large-bore cannula
- Assist mother into left lateral position with tilt
- Inform consultant obstetrician
- Call anaesthetist and theatre team urgently
- Anticipate a sick baby and call neonatal crash team, which must include a senior clinician

##### Specific treatment

- If woman fully dilated, perform vaginal instrumental delivery immediately
- If not favourable for instrumental delivery, obtain informed consent for laparotomy and possible hysterectomy and perform a grade 1 emergency CS – see **Caesarean section** guideline
- See **Postpartum haemorrhage** guideline

### SUBSEQUENT MANAGEMENT

#### Scar rupture confirmed (not simple dehiscence)

- Call consultant obstetrician and consultant anaesthetist
- Manage haemorrhage
- activate major haemorrhage protocol if required
- It may be possible to repair uterus. Hysterectomy or subtotal hysterectomy may be required
- Method of repair depends on nature of tear, degree of haemorrhage and woman's future fertility wishes
- Give broad spectrum IV antibiotics – according to local Trust policy
- Provide mother with high dependency care – see **High dependency care** guideline

#### Communication

- Explain events fully to woman and family including implications for future pregnancies
- Report clinical incident using local incident reporting system

### ANTENATAL CARE

- Women who have history of an uncomplicated lower-segment transverse caesarean section (CS) and an otherwise uncomplicated pregnancy with no contraindications to vaginal birth, discuss options of VBAC or elective CS
- Discuss previous birth experiences with woman. Take her wishes into account and document discussion in maternal healthcare record
- Review notes or request information from other hospital (if applicable) to obtain details of previous CS
- To enable woman to make informed choice, give VBAC leaflet (if available locally) during antenatal period, which includes risks of repeat CS and risks of scar rupture in labour
- Appropriate discussion using locally available VBAC versus elective repeat CS checklist (recommended by RCOG) to facilitate documentation of antenatal counselling and decision making)
- Refer women who are undecided to the birth choices clinic (if available locally) for further counselling
- Obstetrician (ideally consultant, but  $\geq$ ST3), will agree mode of delivery with woman before expected/planned delivery date (ideally by 36 weeks' gestation) and document individual management plan for labour
- Offer women who opt for VBAC an ANC appointment at 40 weeks
- Women with previous CS to have ultrasound scan to:
  - determine placental localisation
  - to exclude placenta praevia
    - if present enables further investigation to identify praevia accreta and enable safe management
- Individual management plan should be made if labour occurs before planned CS
  - record woman's choice
- Inform woman:
  - chances of successful planned VBAC are 72–75%

- $\geq$  1 previous vaginal births (particularly previous VBAC) is associated with a planned VBAC success rate of 85–90%

***Rates of hysterectomy and blood transfusion increase in women who have had  $\geq$ 2 previous caesarean births***

### Contraindications to VBAC

- Previous upper segment CS – advise woman to give birth by elective CS
- previous uterine incision other than an uncomplicated low transverse CS incision
- Previous uterine rupture
- $>$ 2 previous caesarean deliveries
- Women with this history who wish to consider vaginal birth should be assessed by a consultant obstetrician with full access to details of previous surgery (if possible)
- When considering planned VBAC in woman with twin pregnancy, adopt a cautious approach

### Risk factors for unsuccessful VBAC

- Previously failed induction of labour
- No previous vaginal birth
- Body mass index  $>$ 30
- Previous emergency CS for dystocia at  $<$ 8 cm
- VBAC  $\geq$ 40 weeks' gestation
- Birth weight  $\geq$ 4 kg
- Induction of labour for VBAC
- Short inter-delivery interval ( $<$ 12 months since last delivery)
- Advanced maternal age
- Non-white ethnicity

### INTRAPARTUM MANAGEMENT

- If local practice, establish IV access
- FBC and group and screen
- Midwife competent in the care of high-risk conditions should care for woman during labour on a one-to-one basis, and inform delivery suite co-ordinator of any change in care

- Inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) that woman is on labour ward and if mode of delivery not previously agreed ensure a review is undertaken
- Epidural anaesthesia is not contraindicated in planned VBAC
- Offer continuous electronic fetal monitoring (EFM) with onset of regular contractions
- When woman in labour, give ranitidine 150 mg oral approximately 6–8-hrly
- Atypical abdominal pain, vaginal bleeding and/or CTG abnormalities must be regarded as potential uterine rupture in women undergoing VBAC
- loss of station of presenting part
- If any of above detected, inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow) and delivery suite co-ordinator immediately

### INDUCTION OF LABOUR

#### Augmentation

- Use oxytocin with caution
- although not contraindicated, decision to prescribe oxytocin must be made by consultant obstetrician after obstetric assessment, including vaginal examination and discussion with woman
- Normal regime until woman contracting 3 in 10 (ideally not exceeding 4 in 10). Do not increase oxytocin further

***If no progress in labour in the presence of adequate uterine activity and oxytocin augmentation, proceed to CS as soon as possible***

#### Uterine rupture

- See **Uterine rupture** guideline
- Observe for symptoms and signs including:
  - tenderness or sudden pain over scar within abdomen, sudden cessation of uterine activity (especially if pain breaks through epidural) or shoulder tip pain
  - bleeding vaginally not associated to cervical dilatation
  - easily palpable fetal parts
  - haemodynamic instability (low BP, raised pulse, feeling unwell, unresponsive)
- EFM changes showing sudden bradycardia or changes to variability

- Consultant obstetrician will discuss risks with woman
- 2–3-fold increased risk of uterine rupture and around 1.5-fold increased risk of CS in oxytocin-induced and/or augmented labours compared with spontaneous labour
- higher risk of uterine rupture where prostaglandins used for induction of labour
- no increased risk of uterine rupture with induction using transcervical balloon catheter – see **Transcervical catheter induction** guideline
- Women who wish to have VBAC should be seen by consultant obstetrician in antenatal clinic at 40 weeks and offered membrane sweep, discussion on mode of delivery and place of labour and an individualised and documented plan of delivery
- Vaginal examination can help to assess the favourability for induction and method of induction
- membrane sweeping is not contraindicated

#### Monitoring

- Once labour established, record careful serial assessments on partogram – see **Labour management** guideline
- Continuous EFM to detect signs of impending rupture, following the onset of contractions – see **Electronic fetal monitoring** guideline
- In uterine rupture, an abnormal EFM trace is present in 55–87% of cases
- Careful serial cervical assessments, preferably by the same person (for both augmented and non-augmented labours) to ensure adequate progress for VBAC to continue

## INTRODUCTION

- The incidence of breech presentation decreases from approximately 20% at 28 weeks' gestation to 3–4% at term, when most babies will turn spontaneously to cephalic presentation

*After discussion with woman, consultant obstetrician will advise on mode of delivery. Document discussion and decision clearly in maternal healthcare record*

## DEFINITION

- Presentation of fetal buttocks or feet in labour

## ANTENATAL MANAGEMENT

- Unless contraindicated, offer external cephalic version (ECV) preferably at 36–38 weeks' gestation
- Advise women with unfavourable clinical indicators of increased risks to them and their babies if considering vaginal breech delivery

## CONTRAINDICATIONS TO ECV

### Absolute

- Lower segment caesarean section (LSCS) to be performed for another reason (e.g. placenta praevia)
- $\geq 2$  previous LSCS
- Severe oligohydramnios (ECV usually impossible)
- Multiple pregnancy
- Fetal compromise

### Relative

- Intrauterine growth restriction (IUGR)
- Uterine scar
- Known Rh isoimmunisation
- Antepartum haemorrhage
- Women in labour

## INDICATIONS FOR VAGINAL BREECH DELIVERY

- Maternal choice (in some units, vaginal breech delivery is offered as an option)
- Extreme prematurity
- Stillbirth
- Second twin
- Rapid progressive labour with insufficient time to perform caesarean section (CS)

## Favourable features

- Estimated fetal weight 2.0–3.8 kg
- Clinically adequate pelvis (presenting part engaged)
- Complete breech presentation

## INTRAPARTUM MANAGEMENT

- Perform planned vaginal breech deliveries on consultant-led delivery unit with access to facilities for emergency CS
- Planned vaginal breech delivery must only be undertaken by an experienced obstetrician or experienced midwife
- In an emergency situation, midwife is expected to manage delivery

## First stage of labour

- On admission, inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow), who will discuss with consultant obstetrician
- Full intrapartum assessment by midwife/middle grade obstetrician
- Abdominal palpation
- Commence continuous electronic fetal heart monitoring. If difficulty recording fetal heart rate (FHR) abdominally, use fetal scalp electrode applied to buttock only
- Vaginal examination
- Insert cannula and obtain blood for FBC and group and save
- Offer woman choice of analgesia for labour and delivery

## VAGINAL BREECH DELIVERY • 2/3

- for planned vaginal breech delivery, consider epidural analgesia
- Artificial rupture of membranes (ARM) not usually performed due to risk of umbilical cord prolapse
- If rupture of membranes occurs a vaginal examination may exclude cord prolapse
- Avoid oxytocic drugs
- Avoid use of fetal blood sampling during labour on a breech presentation

***If delay or fetal compromise at any stage during labour, consider CS***

- Passage of meconium cannot be relied upon as indicator of fetal distress

### Second stage of labour

- Inform middle grade obstetrician (ST3–7 or equivalent e.g. staff grade, clinical fellow)/consultant and ask to attend for second stage of labour
- Until presenting part is below the level of the ischial spines, discourage bearing down
- Undertake urinary catheterisation
- Perform vaginal examination to confirm fully dilated cervix (particularly important preterm) and position of breech
- In active second stage, assist into lithotomy position to enable breech delivery
- Call anaesthetist and theatre team
- Request attendance of a neonatologist. See **Cardiopulmonary resuscitation of the newborn** guideline in the Staffordshire, Shropshire & Black Country Newborn and Maternity Network Neonatal guidelines (if used locally)

### Delivery

- Allow natural descent of fetal buttocks – **hands off**
- Evaluate the need for episiotomy; consider waiting until fetal anus visible over fourchette
- Ensure fetal spine rotates uppermost during delivery

- Encourage mother to actively push, to aid baby's natural descent and 'minimise handling'. Do not pull on baby's body or legs, flexed breech legs usually deliver spontaneously
- If assistance required to deliver legs, once popliteal fossa visible, release legs by flexing at the knees
- Observe for anterior scapula and allow time for arms to release spontaneously. If assistance required, hook arms down from the elbow. If this is not sufficient, 2 fingers can be passed over the shoulder to push the humerus across the chest
- if other shoulder does not deliver spontaneously, repeat manoeuvre
- Allow baby to hang until nuchal line visible. Deliver head using Mauriceau-Smellie-Veit manoeuvre – combination of maxillary and occiput pressure
- If obstetrician is conducting delivery they may decide to deliver the head using forceps
- Perform active management of the third stage

### Management of malpositions/ complications in the second stage

- If malposition/complications arise in second stage – obstetric middle grade to request on-call consultant obstetrician to attend
- **Nuchal arm:** rotate fetal spine to enable internal Lovset's manoeuvre
- **Delayed engagement in the pelvis of the after-coming head:** second attendant applies suprapubic pressure to assist flexion of head
- alternatively first attendant displaces head upwards and rotates to the oblique diameter to facilitate engagement
- **Delivery of the obstructed after-coming head:** if usual breech delivery manoeuvres fail, consider tocolysis, McRoberts manoeuvre, incision of the cervix, symphysiotomy or CS

### Preterm breech

- Perform vaginal examination to confirm second stage of labour
- Discuss mode of delivery of a preterm breech on an individual basis with woman and partner wherever possible
- If labour well established, there may be no choice but to proceed to a vaginal delivery. In this case, **most senior person available** must carry out delivery
- Where there is entrapment of after-coming head, consider lateral incision of cervix

### Post-delivery

- Obtain cord blood for venous/arterial testing and record result – see **Umbilical cord sampling** guideline
- Debrief parents
- Arrange neonatal review for newborn and infant physical examination (NIPE)
- Refer to local guidance on screening for congenital hip dysplasia

### Documentation

- Ensure clear documentation of:
  - procedure
  - help summoned
  - names and grades of personnel attending
  - timing of events
  - communication with woman
- Follow local incident reporting procedure

### RECOGNITION AND ASSESSMENT

- Diagnosis of DVT and pulmonary embolism in pregnancy can be challenging because of the physiological changes that occur. Many of the classical symptoms of venous thromboembolism can:
  - occur in a low risk pregnancy
  - be normal in pregnancy

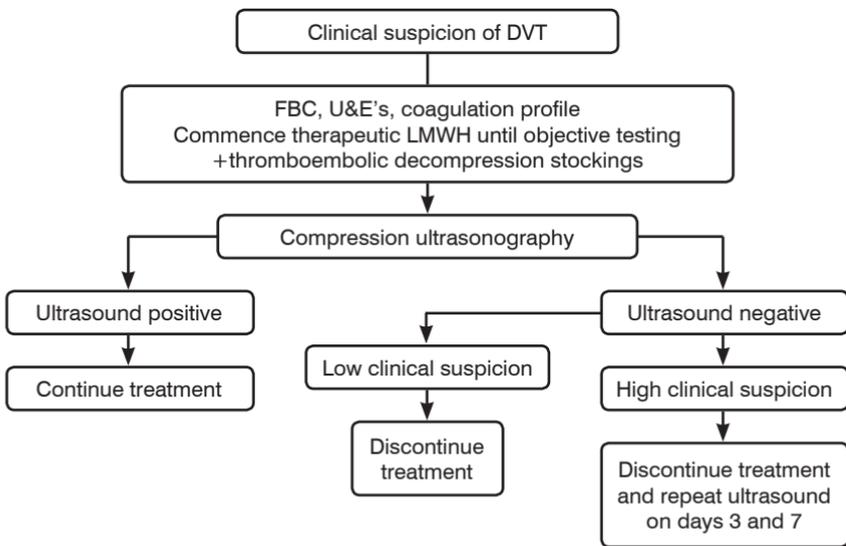
### Symptoms and signs

- Pain in affected leg/calf (more common in left leg)
- Calf tenderness and swelling >3 cm asymmetry between calves
- Swelling of entire leg (usually unilateral)
- Pitting oedema
- Calf tenderness
- Erythema
- Collateral superficial veins
- Increased skin temperature in affected leg
- Raised WCC
- Lower abdominal pain (pelvic extension of VTE)

### Investigations

*If DVT suspected, start therapeutic treatment with low molecular weight heparin (LMWH), unless contraindicated until diagnosis refuted. FBC, coagulation profile, U&E's and LFTs to be taken before anticoagulation therapy*

- Thrombophilia screen before starting anticoagulant treatment not recommended, as will not alter immediate treatment and is affected by pregnancy
- Compression or duplex (Doppler) ultrasound is the first line diagnostic test for DVT in pregnancy. It is non-invasive, highly sensitive (97%) and specific (96%) for symptomatic proximal vein DVT, but less accurate for isolated calf DVT
- if symptoms suggestive of PE, see **VTE – Pulmonary embolism** guideline
- If iliac vein thrombosis suspected (back pain and swelling of entire limb), discuss with radiologist
- Leg elevation and thromboembolic decompression stockings to reduce oedema and encourage mobilisation



**TREATMENT**

**General**

- Adequate analgesia
- in initial management of DVT, elevate leg and fit graduated elastic compression stocking to reduce oedema

**Specific**

- Blood for FBC, INR, APTT
- If platelet count < 75 x 10<sup>9</sup>/L, seek advice from on-call haematologist before starting anticoagulation
- If platelet count ≥ 75 x 10<sup>9</sup>/L, prescribe subcutaneous LMWH

**Initial anticoagulant treatment in pregnancy**

- In clinically suspected DVT, administer LMWH (dalteparin or enoxaparin – according to local practice) at doses in **Table 1** until objective testing excludes diagnosis
- titrate dose against the woman’s booking/early pregnancy weight
- In women with renal impairment, seek advice on dosage from haematologist
- If weight is > 125 kg – discuss with haematologist
- Postnatal LMWH dose:
  - enoxaparin: 1.5 mg/kg daily
  - dalteparin: 10,000–18,000 units daily according to weight

**Monitoring LMWH treatment**

- If woman has not been given unfractionated heparin, monitoring for heparin-induced thrombocytopenia is not required
- If early pregnancy weight < 50 kg or > 90 kg and woman has bleeding problems, renal impairment, or massive PE, discuss need for anti-Xa monitoring with consultant haematologist
- if monitoring required undertake 3–4 hr after injection; aiming for levels 0.7–1.1 unit/mL
- if levels raised reduce dose of LMWH – discuss with consultant haematologist
- Check anti-factor Xa levels every 4 weeks
- If post-operative and receiving unfractionated heparin, monitor platelet count every 2–3 days from day 4–14, or until heparin is stopped, whichever occurs first

**Maintenance treatment**

- Therapeutic LMWH during remainder of pregnancy and ≥ 6 weeks postnatally, until ≥ 3 months of treatment given

**Anticoagulant therapy during labour and delivery**

- Discontinue LMWH maintenance therapy 24 hr before planned delivery e.g. elective caesarean section, including planned induction of labour
- Advise woman that once she is established in labour or thinks she is in labour, no further heparin or other anticoagulant should be injected

**Table 1**

Initial dose	EARLY PREGNANCY WEIGHT (KG)				
	<50	50–69	70–89	90–109	110–125
Dalteparin	5000 units 12-hrly	6000 units 12-hrly	8000 units 12-hrly	10,000 units 12-hrly	12,500 units 12-hrly
Enoxaparin	40 mg 12-hrly	60 mg 12-hrly	80 mg 12-hrly	100 mg 12-hrly	120 mg 12-hrly

- If VTE occurs during labour and delivery, consider using unfractionated heparin, as it is more easily manipulated
- If delivery is by caesarean section, consider the use of wound drains (abdominal and rectus sheath and interrupted closure of skin incision for women on therapeutic doses)
- If woman chooses to commence warfarin postpartum, avoid until at least the third postnatal day
- Regular INR testing is recommended during the transfer from LMWH to warfarin to avoid over-anticoagulation (especially in first 10 days)
- Monitor INR 4 days after starting warfarin

### Administration of LMWH and use of epidural/spinal anaesthesia

- Before carrying out regional anaesthetic procedures, (i.e. insertion of epidural catheter or administration of spinal injection) record when most recent dose of LMWH was given and follow the steps below:
  - wait 12 hr after prophylactic dose of LMWH
  - wait 24 hr after therapeutic dose of LMWH
- After insertion/removal of epidural catheter (or after insertion of spinal anaesthetic) review the time elapsed before administering dose of LMWH. LMWH can be given postnatally while epidural is *in situ*:
  - a thromboprophylactic dose of LMWH can be given 4 hr after removal of epidural catheter
- Do not remove epidural catheter ≤12 hr of most recent LMWH

### Postnatal anticoagulation

- Continue therapeutic anticoagulant therapy for ≥6 weeks postnatally and until ≥3 months of treatment has been given in total. Offer a choice of LMWH or oral anticoagulant (warfarin)
- If starting warfarin, provide woman with counselling and an oral anticoagulant booklet. Document in book (including dose to take until next INR check) with follow-up appointment on discharge
- Heparin and warfarin are not contraindicated in breastfeeding

### DISCHARGE AND FOLLOW-UP

- Offer women who have been diagnosed with VTE during pregnancy or postnatal period a 6 week–3 month postnatal appointment with consultant haematologist
  - assess post-thrombotic venous damage
  - perform thrombophilia test as necessary
- Give advice on need for thromboprophylaxis in future pregnancy(s) and at other times of increased risk, i.e. hormonal contraception and HRT

## RECOGNITION AND ASSESSMENT

- Diagnosis of DVT and pulmonary embolism in pregnancy can be challenging because of the physiological changes that occur. Many of the classical symptoms of venous thromboembolism can occur in a low risk pregnancy without VTE

## Symptoms and signs

- Dyspnoea/cyanosis
- Collapse
- Chest pain
- Cough
- Haemoptysis
- Faintness/shock
- Tachycardia
- Tachypnoea
- Mild pyrexia
- Raised JVP
- Loud heart sound and right ventricular heave
- Pleural rub/effusion
- Reduced PaO<sub>2</sub> +/- PaCO<sub>2</sub>
- A high clinical suspicion is critical to diagnosis

***If PE suspected, start treatment with low molecular weight heparin (LMWH) until diagnosis confirmed or refuted, unless contraindicated***

## Investigations

- Oxygen saturation
- ABG (limited value when used alone)
- FBC
- Coagulation profile
- U&Es
- LFTs
- ECG
- sinus tachycardia common
- with large PE there may be:
  - T wave inversion (most common abnormality)
  - right-axis deviation
  - right bundle-branch block
  - peaked P waves in lead II due to right atrial dilatation

- classical S1Q3T3 rarely seen
- CXR (with fetal shielding) to exclude:
  - pneumonia
  - lung collapse
  - pneumothorax
  - features seen in PE:
    - areas of translucency in under perfused lungs
    - atelectasis
    - wedge-shaped infarction
    - pleural effusion
  - if another cause for pleuritic chest pain found, treat appropriately
- Discuss choice of ventilation perfusion (VQ) lung scan or computerised tomographic pulmonary angiography (CTPA) with radiologist
- VQ scan: if CXR normal, perform lung perfusion scan (Q scan)
  - minimises radiation dose to the fetus, but has higher negative predictive value
  - CTPA: if CXR abnormal, CTPA is first choice for radiological imaging
  - advise woman that compared with CTPA, VQ scanning may carry a slightly increased risk of childhood cancer (1/280,000 versus 1/1,000,000) but is associated with a lower risk of maternal breast cancer
- Diagnosis of DVT may indirectly confirm a diagnosis of PE and, since anticoagulant therapy is the same for both conditions, further investigation may not be necessary. This would limit the radiation doses given to woman and fetus for all suspected non-massive PE (normal CXR, ECG and haemodynamically stable)
- If woman is haemodynamically unstable an echocardiogram is useful to identify right ventricular dysfunction
- Pulmonary angiography: reserved for severe cases before embolectomy
- Continue anticoagulant treatment until PE definitely excluded

**TREATMENT**

**Women at risk of haemorrhage:**

- If at risk and continued heparin treatment essential, use unfractionated heparin IV
- has a shorter half-life and its activity is more completely reversed with protamine sulphate
- If woman develops a haemorrhage while on LMWH: stop treatment and discuss with haematologist

**Massive life-threatening PE in pregnancy**

- Resuscitate and give oxygen
- Involve multidisciplinary resuscitation team including consultant physician, consultant obstetrician, consultant anaesthetist and radiologist
- If PE confirmed, urgent CTPA or portable ECHO and team decide whether IV unfractionated heparin, thrombolytic therapy or thoracotomy and surgical embolectomy appropriate
- IV unfractionated heparin is preferred in massive PE because of its rapid effect and extensive experience of use
- indicated for massive PE and where aggressive management required
- loading dose of 80 units/kg (5000 units) over 5 min, followed by 18 units/kg/hr (e.g. for 70 kg woman, usually 1500 units/hr) continuous IV infusion (based on booking weight) to maintain APTT of 2–3 times average laboratory control value. If thrombolysis is given, omit loading dose of heparin

- in women with renal impairment, seek advice on dose reduction from haematologist
- Decision of thoracotomy or surgical embolectomy to be made by consultant obstetrician, consultant physician, consultant thoracic surgeon and radiologist

**General**

- Resuscitate and give oxygen to maintain SpO<sub>2</sub> between 94–98%
- Adequate analgesia

**Specific**

- Blood for FBC, INR, APTT, U&E's, LFTs, ABGs
- CXR
- ECG
- If platelet count <75 x 10<sup>9</sup>/L, seek advice from on-call haematologist before starting anticoagulation
- If platelet count ≥75 x 10<sup>9</sup>/L, prescribe subcutaneous LMWH (dalteparin or enoxaparin – according to local practice)

**Initial anticoagulant treatment in pregnancy**

- In clinically suspected DVT or PE, administer LMWH at doses below until objective testing excludes diagnosis
- If weight is >125 kg – discuss with haematologist

**Therapeutic dose of LMWH**

Initial dose	EARLY PREGNANCY WEIGHT (KG)				
	<50	50–69	70–89	90–109	110–125
Dalteparin	5000 units 12-hrly	6000 units 12-hrly	8000 units 12-hrly	10,000 units 12-hrly	12,500 units 12-hrly
Enoxaparin	40 mg 12-hrly	60 mg 12-hrly	80 mg 12-hrly	100 mg 12-hrly	120 mg 12-hrly

**Monitoring LMWH treatment**

- If woman has not been given unfractionated heparin, monitoring for heparin-induced thrombocytopenia is not required
- If early pregnancy weight <50 kg or >90 kg and woman has bleeding problems, renal impairment, or massive PE, discuss need for anti-Xa monitoring with consultant haematologist

**Maintenance treatment**

- Therapeutic LMWH during remainder of pregnancy and  $\geq 6$  weeks postnatally, until  $\geq 3$  months of treatment given

**Anticoagulant therapy during labour and delivery**

- See **VTE – Deep vein thrombosis** guideline

**Administration of LMWH and use of epidural/spinal anaesthesia**

- See **VTE – Deep vein thrombosis** guideline

**Postnatal anticoagulation**

- If no problems with bleeding, re-start anticoagulation treatment 4 hr after delivery
- Continue therapeutic anticoagulant therapy for  $\geq 6$  weeks postnatally and until  $\geq 3$  months of treatment has been given in total. Offer a choice of LMWH or oral anticoagulant (warfarin)
- LMWH:
  - dalteparin (10,000–18,000 units according to weight) OR
  - enoxaparin (1.5 mg/kg daily)
- If starting warfarin, provide woman with counselling and an oral anticoagulant booklet. Document in book (including dose to take until next INR check) with follow-up appointment on discharge

- Heparin and warfarin are not contraindicated in breastfeeding
- If woman chooses to commence warfarin postpartum, avoid until at least the third postnatal day
- Regular INR testing is recommended during the transfer from LMWH to warfarin to avoid over anticoagulation, especially in the first 10 days
- Monitor INR for 4 days after commencing warfarin

**DISCHARGE AND FOLLOW-UP**

- See **VTE – Deep vein thrombosis** guideline

**INTRODUCTION**

- Venous thromboembolism (VTE) is up to 10 times more common in pregnant women than in non-pregnant women of the same age and can occur at any stage of pregnancy, but the puerperium is the time of highest risk
- MBRRACE report highlighted 50% of fatal VTE occurred antenatally, half of which were in the first trimester

**RISK ASSESSMENT AND MANAGEMENT**

- Complete local risk assessment proforma for thromboprophylaxis at:
  - antenatal booking (or before pregnancy if possible)
  - antenatal admission or if intercurrent problems develop
  - risk assessment in labour
  - post-delivery

**Table 1: Antenatal**

RISK FACTOR	RISK LEVEL/ACTION
<ul style="list-style-type: none"> <li>● Any previous VTE except a single event related to major surgery</li> </ul>	<ul style="list-style-type: none"> <li>● <b>High risk</b> <ul style="list-style-type: none"> <li>● antenatal prophylaxis with LMWH. Refer to local thrombosis in pregnancy expert/team</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● Hospital admission</li> <li>● Single previous VTE related to major surgery</li> <li>● High risk thrombophilia + no VTE</li> <li>● Medical comorbidities e.g. cancer, heart failure, active SLE, IBD or inflammatory polyarthropathy, nephrotic syndrome, type 1 diabetes mellitus (DM) with nephropathy, sickle cell disease, current intravenous drug user</li> <li>● Any surgical procedure e.g. appendectomy</li> <li>● Ovarian hyperstimulation syndrome (first trimester only)</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Intermediate risk</b> <ul style="list-style-type: none"> <li>● consider antenatal prophylaxis with LMWH</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● Obesity (BMI &gt;30 kg/m<sup>2</sup>)</li> <li>● Age &gt;35 yr</li> <li>● Parity ≥3</li> <li>● Smoker</li> <li>● Gross varicose veins</li> <li>● Current pre-eclampsia</li> <li>● Immobility, e.g. paraplegia, pelvic girdle pain (PGP)</li> <li>● Family history of unprovoked or oestrogen-provoked VTE in first-degree relative</li> <li>● Low risk thrombophilia</li> <li>● Multiple pregnancy</li> <li>● IVF/ART</li> <li>● Transient risk factors                             <ul style="list-style-type: none"> <li>● dehydration/hyperemesis</li> <li>● current systemic infection</li> <li>● long-distance travel (&gt;4 hr)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● ≥4 risk factors: prophylaxis from first trimester</li> <li>● 3 risk factors: prophylaxis from 28 weeks</li> <li>● &lt;3 risk factors – lower risk: mobilisation and avoidance of dehydration</li> </ul>

**Table 2: Postnatal**

RISK FACTOR	RISK LEVEL/ACTION
<ul style="list-style-type: none"> <li>● Previous VTE</li> <li>● Requiring antenatal LMWH</li> <li>● High-risk thrombophilia</li> <li>● Low-risk thrombophilia + family history</li> </ul>	<ul style="list-style-type: none"> <li>● <b>High risk</b></li> <li>● ≥6 week postnatal prophylactic LMWH</li> </ul>
<ul style="list-style-type: none"> <li>● Caesarean section (CS) in labour</li> <li>● BMI ≥40 kg/m<sup>2</sup></li> <li>● Readmission or prolonged admission (≥3 days) in the puerperium</li> <li>● Any surgical procedure in the puerperium except immediate repair of perineum</li> <li>● Medical comorbidities e.g. cancer, heart failure, active SLE, IBD or inflammatory polyarthropathy, nephrotic syndrome, type 1 DM with nephropathy, sickle cell disease, current intravenous drug user</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Intermediate risk</b></li> <li>● ≥10 days postnatal prophylactic LMWH</li> <li>● if persisting, or &gt;3 risk factors, consider extending thromboprophylaxis with LMWH</li> </ul>
<ul style="list-style-type: none"> <li>● Age &gt;35 yr</li> <li>● Obesity (BMI ≥30 kg/m<sup>2</sup>)</li> <li>● Parity ≥3</li> <li>● Smoker</li> <li>● Elective CS</li> <li>● Family history of VTE</li> <li>● Low-risk thrombophilia</li> <li>● Gross varicose veins</li> <li>● Current systemic infection</li> <li>● Immobility, e.g. paraplegia, PGP restricting mobility, long-distance travel</li> <li>● Current pre-eclampsia</li> <li>● Multiple pregnancy</li> <li>● Preterm delivery in this pregnancy (&lt;37 weeks)</li> <li>● Stillbirth in this pregnancy</li> <li>● Mid-cavity rotational or operative delivery</li> <li>● Prolonged labour (&gt;24 hr)</li> <li>● PPH &gt;1 L or blood transfusion</li> </ul>	<ul style="list-style-type: none"> <li>● ≥2 risk factors – see <b>Intermediate risk</b> above</li> <li>● &lt;2 risk factors – lower risk: early mobilisation and avoidance of dehydration</li> </ul>

***Perform VTE risk assessment and initiate appropriate action using local VTE assessment tool***

### Special circumstances requiring thromboprophylaxis

- Unless contraindicated, the following require thromboprophylaxis:
  - massive PPH
  - severe PET
  - severe post dural puncture headache

### Oral anticoagulants

- Women on long-term warfarin or other oral anticoagulants:
  - counsel about risks of agents to fetus
  - advise to stop oral anticoagulant, except for mechanical heart valve
  - change to LMWH as soon as pregnancy confirmed (ideally  $\leq 2$  week of missed menstrual cycle and  $< 6$  weeks' gestation)
  - if exposed to warfarin in early pregnancy refer to fetal medicine department

## MANAGEMENT

### General

- Do not allow woman to become dehydrated
- Encourage mobilisation
  - if immobilised, arrange leg exercises as soon as possible after surgery
- Consider using regional anaesthesia if appropriate (risk of VTE is higher with general anaesthesia)
- Risk assessment (using local VTE assessment tool) to ascertain if further measures necessary [e.g. graduated compression stockings (GCS), LMWH]
- In some circumstances, mechanical compression devices will be used e.g. where GCS or LMWH contraindicated
- If original VTE provoked by major surgery from which woman now recovered, and providing no other risk factors: LMWH from 28 weeks' gestation

- See all women treated with thromboprophylaxis in antenatal clinic in third trimester to discuss plan of delivery and treatment regimen
- Warfarin: avoid in pregnancy (except for mechanical heart valve – discuss with cardiologist)

### Graduated compression stockings (GCS)

- On admission, offer GCS, unless contraindicated (see below)
- Staff trained in the use of compression stockings to show woman how to wear them correctly and monitor use
- Encourage women to wear GCS from admission until they return to their usual levels of mobility

### Contraindications to GCS

- Peripheral vascular disease
- Severe dermatitis
- Recent skin graft
- Leg deformity
- Peripheral neuropathy

### LMWH

- If risk of bleeding, give thromboprophylaxis in 2 divided doses
- One week thromboprophylaxis for most women but 6 weeks if high risk, including previous VTE

**Table 3: Thromboprophylactic doses for antenatal and postnatal LMWH**

Weight	Enoxaparin	Dalteparin
<50 kg	20 mg once daily	2500 units once daily
50–90 kg	40 mg once daily	5000 units once daily
91–130 kg	60* mg once daily	7500 units once daily
131–170 kg	80 mg* once daily	10,000 units once daily
>170 kg	0.6 mg/kg/day*	75 units/kg/day
High prophylactic dose for women weighing 50–90 kg	40 mg 12-hrly	5000 units 12-hrly

\*may be given in 2 divided doses

### High thromboprophylaxis dose

- If high thromboprophylaxis dose required, seek advice from haematologist
- Any woman weighing >90 kg (booking weight) receiving high dose low molecular weight thromboprophylaxis – check anti-Xa levels
- anti-Xa cannot be carried out as an urgent test and result may not be available for 2–3 days but would at least guide subsequent treatment
- If woman at very high risk of VTE or previously on long-term anticoagulation – refer to thrombosis clinic or seek advice from haematologist

### Contraindications to LMWH

- Active bleeding
- High risk of major haemorrhage (e.g. placenta praevia)
- Platelet count <75 x 10<sup>9</sup>/L
- Coagulopathies (including low platelet count <75 x 10<sup>9</sup>/L)
- Severe renal impairment or established renal failure
- Liver disease
- Uncontrolled hypertension (≥230 mmHg systolic)
- Allergy to heparin/LMWH
- Acute stroke in previous 4 weeks

### Epidural/spinal anaesthesia – precautions

- If vaginal bleeding or labour begins, stop LMWH
- If elective CS: give thromboprophylactic dose of LMWH on day before delivery
  - morning dose should be omitted and operation performed that morning
- High prophylactic dose or therapeutic dose – change to prophylactic dose on day before planned delivery
- Before carrying out regional anaesthetic procedures, (i.e. insertion of epidural catheter or administration of a spinal injection) record when the most recent dose of LMWH was given and follow the steps below:
  - wait 12 hr after prophylactic dose of LMWH
  - wait 24 hr after therapeutic dose of LMWH
- After insertion/removal of epidural catheter (or after insertion of spinal anaesthetic) review time elapsed before administering a dose of LMWH. LMWH can be given postnatally while epidural is *in situ*
  - can be given ≥4 hr after use of spinal anaesthesia or after removal of epidural catheter
- Do not remove epidural catheter ≤12 hr of most recent LMWH
- If regional technique was traumatic or had a bloody tap, consider skipping next dose of LMWH

### Induction of labour

- If receiving high prophylactic or therapeutic doses of LMWH: reduce dose to normal thromboprophylactic dose on day before induction of labour
- reassess before recommencing
- Anaesthetic review in labour
- Stop LMWH on day of induction

### Labour and delivery

- Stop LMWH injections once labour commences or if any vaginal bleeding
- if no PPH and regional analgesia not used, give first dose as soon as possible after delivery
- Restart thromboprophylaxis as soon as immediate risk of haemorrhage reduced and platelets/clotting within acceptable range

### Elective CS

- Omit morning LMWH dose
- surgery to be performed that morning
- Increased risk of wound haematoma with LMWH; consider use of wound drains and interrupted closure of skin
- Carry out risk assessment before and after delivery
- continue postpartum thromboprophylaxis
- for persistent risk factors, e.g. prolonged admission, wound infection or surgery in the puerperium: extend for  $\geq 6$  week, or until additional risk factor no longer present

### Other thromboprophylactic agents

- Warfarin:
  - women receiving long-term warfarin can be converted from LMWH to warfarin postpartum when risk of haemorrhage reduced (usually 5–7 days)
  - safe when breastfeeding

### INDICATIONS

- Pregnant woman at term who is suitable for low-risk care in labour
- Women who request waterbirth against advice must be seen by consultant obstetrician as soon as possible. Refer to local guidance on management for waterbirth on a consultant unit

### Preparation and cleaning of pool

- Follow local infection control measures

### FIRST STAGE LABOUR

#### Before entering pool

- Labour should be established

#### During labour

***Do not leave woman unaccompanied in the pool***

- Fill pool to level of mother's breasts
- In warm, humid environment, encourage fluids to prevent maternal dehydration
- Monitor maternal temperature closely and discontinue use of pool if a rise of 1°C above baseline
- Monitor and record fetal heart rate with watertight doppler – see **Intermittent auscultation** guideline
- Monitor water hourly to maintain a temperature that is comfortable for the woman but do not exceed 37.5°C **at any time**
- Keep water clear of debris
- Woman to be attended at all times (this can be by her birth partner)
- Use only nitrous oxide and oxygen (50/50) for analgesia in waterbirth

### SECOND STAGE LABOUR

- 2 midwives must be present at birth
- Delivery is mainly a 'hands-off' procedure and control of the head is therefore unnecessary as immersion in water appears to facilitate slow crowning
- Following delivery of the head, the trunk should be expelled with next contraction
- Deliver baby completely under the water and bring to the surface immediately with the face uppermost
- If baby does not deliver with next contraction, change mother's position in pool to all-fours or deep squat where birth can be completed in the pool, or standing with a leg on side of the pool, where baby will be delivered into air

***Do not re-submerge baby once baby has taken its first breath***

### THIRD STAGE MANAGEMENT

- Placental delivery and control of bleeding will be dependent on maternal consent for active or physiological management
- Physiological management may be completed in the pool, dependent on maternal request and local policy
- Observe for deviations from the norm
- Manage signs of maternal compromise as per local practice

### Postpartum haemorrhage

- Maternal compromise may indicate postpartum haemorrhage
- Estimation of blood loss is difficult in water and therefore it is estimated at < or >500 mL
- For major obstetric haemorrhage – see **Antepartum haemorrhage** guideline and **Postpartum haemorrhage** guideline
- If perineal suturing required, allow 1 hr for oedema to reduce

### REASONS FOR MOTHER LEAVING POOL

- Fetal distress
- Meconium stained liquor
- Failure to progress
- Mother becomes unsuitable for low-risk care e.g. pyrexia, bleeding, fainting
- Maternal request or to pass urine
- Maternal request for analgesia other than inhaled (50/50) nitrous oxide and oxygen
- Excessive water contamination

### EVACUATION POLICY

- In the event of an emergency where mother unable to make an assisted rapid exit from birthing pool
- Call for help, using emergency call bell system
- Rapidly fill pool to allow woman to float to the top. Support her head above water
- Use evacuation equipment available locally (kept in birthing pool room at all times)
- Ensure minimum of 4 adults (ideally 6) 2 or 3 each side of the pool
- Remove foot of bed and bring bed to foot of birthing pool
- Evacuate mother from pool with 2 consecutive manoeuvres, first to bottom edge of bed, a short pause, and then complete manoeuvre onto bed
- **Remember** – the woman will be wet and at risk of hypothermia – dry immediately

<b>A</b>		<b>Diabetes in pregnancy</b>	<b>50, 54, 57</b>
Abdominal palpation	24, 48, 58, 136, 138–139, 170, 183, 202, 204, 268	<b>Diminished fetal movements</b>	<b>58</b>
Acute respiratory distress syndrome (ARDS)	233	Disseminated intravascular coagulation (DIC)	19, 45–46, 103, 200, 204, 235, 237, 239
Amniotic fluid embolism	43–47, 200	<b>E</b>	
Amniotomy	48–49, 107, 123, 260	Early warning scoring	18–19, 102–103, 121, 185, 198, 201, 203, 212, 232–233
<b>Anaemia in pregnancy</b>	<b>14</b>	<b>Eclampsia</b>	<b>61</b>
<b>Anaesthesia – epidural</b>	<b>72</b>	<b>Electronic fetal monitoring</b>	<b>62, 66</b>
<b>Anaesthesia – general</b>	<b>91</b>	Emergency caesarean section	19, 26–27, 176, 246, 249
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# Obstetric Guidelines 2017–19

This book has been compiled as an aide-memoire for all staff concerned with the management of pregnant women and newborn babies, towards a more uniform standard of care across the Staffordshire, Shropshire & Black Country Newborn and Maternity Network and Southern West Midlands Maternity and Newborn Network hospitals

These guidelines are advisory, not mandatory

Every effort has been made to ensure accuracy

The authors cannot accept any responsibility for adverse outcomes

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