Guidelines & Protocols in OBGY

A Ready Reckoner

Labour Room Diaries

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Team NOGS 20-21

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From The President's Desk ...

Dear Members,

It gives me immense pleasure to release the second volume our **'READY RECKONER - The Guidelines and Protocols in Ob-Gy'**.

In this era of evidence based medicine, it is expected that all treatment modalities be guidelines based. To have a quick access to the standard guidelines and have them well sorted out, we will be releasing this ready reckoner on various essential topics every month.

This **first of its kind and unique attempt** is our small effort to simplify protocols.

With great pleasure we announce the release of its Second volume : **'Labour Room Diaries'**. I am sure, this release will be valuable in your daily clinical practice and help in quick amending.

I will fail in my duty if, I don't acknowledge the tremendous efforts and contributions from the Coordinator, Dr. Jayshree Upadhay and Clinical Secretary, Dr. Sumeet Baheti. They have toiled very hard to compile these guidelines for your benefit .

Happy reading ...

Wishing you all Safe and Ethical Clinical Practice ...

Academically yours,

Dr. Vaidehi Marathe

President NOGS - 2020-21

The Team

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NICE Guideline

- Most women will go into labour spontaneously by 42 weeks.
- At the 38 week antenatal visit, all women should be offered information about the risks associated with pregnancies that last longer than 42 weeks, & their options.

The Bishop score

- Group of measurements made by doing a vaginal examination.
- It is based on the station, dilation, effacement (or length), position and consistency of the cervix.
- A score of ≥8 - generally indicates that the cervix is ripe, or 'favourable'
  - high chance of spontaneous labour, or response to interventions made to induce labour

Recommended methods for induction of labour

Non-pharmacological methods

- Healthcare professionals should inform women that the available evidence does not support the following methods for induction of labour:
  - herbal supplements
  - acupuncture
  - homeopathy
  - castor oil
  - hot baths
  - enemas
  - sexual intercourse

Membrane sweeping

- It involves the examining finger passing through the cervix to rotate against the wall of the uterus, to separate the chorionic membrane from the deciduas
- If the cervix will not admit a finger, massaging around the cervix in the vaginal fornices may achieve a similar effect
- Membrane sweeping is regarded as an adjunct to induction of labour rather than an actual method of induction.
- Nulliparous women - offer vaginal examination for membrane sweeping - at the 40 and 41 week
- Parous women - offer vaginal examination for membrane sweeping - at the 41 week

Pharmacological methods of Induction of labour

- Vaginal PGE2 is the preferred method of induction of labour, unless there are specific clinical reasons for not using it (in particular the risk of uterine hyperstimulation)
- It should be administered as a gel, tablet or controlled-release pessary.
- The recommended regimens are:
  - one cycle of vaginal PGE2 tablets or gel: one dose, followed by a second dose after 6 hours if labour is not established (up to a maximum of two doses)
  - one cycle of vaginal PGE2 controlled-release pessary: one dose over 24 hours.
- Misoprostol should only be offered as a method of induction of labour to women who have intrauterine fetal death

Surgical Methods

Amniotomy, alone or with oxytocin

It should not be used as a primary method of induction of labour unless there are specific clinical reasons for not using vaginal PGE2, in particular the risk of uterine hyperstimulation

Mechanical Methods

Balloon catheters and laminaria tents

should not be used routinely for induction of labour

Methods not recommended for induction of labour

- oral PGE2
- extra-amniotic PGE2
- intravenous oxytocin alone
- corticosteroids
- vaginal nitric oxide donors
- intravenous PGE2
- intracervical PGE2
- hyaluronidase
- oestrogen

Monitoring

- Before induction of labour assess Bishop score and confirm normal fetal heart rate pattern using electronic fetal monitoring
- Wherever induction of labour is carried out, facilities should be available for continuous electronic fetal heart rate and uterine contraction monitoring
- After administration of vaginal PGE2, when contractions begin, fetal wellbeing should be assessed with continuous electronic fetal monitoring. Once the cardiotocogram is confirmed as normal, intermittent auscultation should be used unless there are clear indications for continuous electronic fetal monitoring
- If the fetal heart rate is abnormal after administration of vaginal PGE2, recommendations on management of fetal compromise should be followed.
- Bishop score should be reassessed 6 hours after vaginal PGE2 tablet or gel insertion, or 24 hours after vaginal PGE2 controlled release pessary insertion, to monitor progress
- Once active labour is established, maternal and fetal monitoring should be carried out.

Pain Relief

- Women should be informed of the availability of pain relief options during induction of labour. This can range from simple analgesics to epidural analgesia.
- Birth attendants should offer women support and analgesia as required, and should encourage women to use their own coping strategies for pain relief
- The opportunity to labour in water is recommended for pain relief

Prevention and management of complications

Uterine hyperstimulation

- Tocolysis should be considered if uterine hyperstimulation occurs during induction of labour

Failed induction

- Failed induction is defined as labour not starting after one cycle of treatment
- Reasses the woman's condition and the pregnancy in general and fetal wellbeing should be assessed using electronic fetal monitoring.
- If induction fails, the subsequent management options include:
  - a further attempt to induce labour
  - caesarean section

Cord prolapse

To reduce the likelihood of cord prolapse, which may occur at the time of amniotomy, the following precautions should be taken:

- Before induction, engagement of the presenting part should be assessed.
- Palpate for umbilical cord presentation during the preliminary vaginal examination and avoid dislodging the baby's head.
- Amniotomy should be avoided if the baby's head is high.
- Check that there are no signs of a low-lying placental site before membrane sweeping and before induction of labor.

Uterine Rupture

If uterine rupture is suspected during induced labour, the baby should be delivered by emergency caesarean section

Induction of labour in specific circumstances

Prevention of prolonged pregnancy

- Women with uncomplicated pregnancies should be given every opportunity to go into spontaneous labour.
  - offer induction of labour between 41 and 42 weeks to avoid the risks of prolonged pregnancy.
- From 42 weeks, she should be offered increased antenatal monitoring of at least twice-weekly cardiotocography and ultrasound estimation of maximum amniotic pool depth.

Preterm prelabour rupture of membranes

- If a woman has preterm prelabour rupture of membranes, induction of labour should not be carried out before 34 weeks unless there are additional obstetric indications
- If a woman has preterm prelabour rupture of membranes after 34 weeks, discuss the following factors with her before a decision is made about whether to induce labour, using vaginal PGE2
  - risks to the woman like sepsis, possible need for caesarean section
  - risks to the baby like sepsis, problems relating to preterm birth
  - local availability of neonatal intensive care facilities
- Women with prelabour rupture of membranes at term or over 37 weeks - offer choice of induction of labour with vaginal PGE2 or expectant management.
- Induction of labour is done approximately 24 hours after prelabour rupture of the membranes at term.

Previous caesarean section

- If delivery is indicated, women who have had a previous caesarean section may be offered induction of labour with vaginal PGE2, caesarean section or expectant management on an individual basis, taking into account the woman's circumstances and wishes.
- Women should be informed of the following risks with induction of labour:

  Increased risk of need for emergency caesarean section

  Increased risk of uterine rupture
- Induction of labour should not routinely be offered on maternal request alone.
- Vaginal PGE2 is either not recommended or should be used with caution, depending on the preparation (gel, tablet or pessary).
- Informed consent should be obtained and documented.

Breech Presentation

- Induction of labour is not generally recommended in the breech presentation
- If external cephalic version is unsuccessful, declined or contraindicated, and the woman chooses not to have an elective caesarean section, induction of labour should be offered, if delivery is indicated, after discussing the associated risks with the woman

Fetal growth restriction

- If there is severe fetal growth restriction with confirmed fetal compromise, induction of labour is not recommended.

History of precipitate labour

- Induction of labour to avoid a birth unattended by healthcare professionals should not be routinely offered to women with a history of precipitate labour.

Intrauterine fetal death

- Offer support to help women and their partners and/or family cope with the emotional and physical consequences of the death.
- If the woman appears to be physically well, her membranes are intact and there is no evidence of infection or bleeding, she should be offered a choice of immediate induction of labour or expectant management
- If there is evidence of ruptured membranes, infection or bleeding, immediate induction of labour is the preferred management
- If a woman chooses to proceed with induction of labour, oral mifepristone, followed by induction of labour with vaginal PGE2 or vaginal misoprostol should be offered
- For women who have intrauterine fetal death and who have had a previous caesarean section, the risk of uterine rupture is increased. The dose of vaginal prostaglandin should be reduced accordingly, particularly in the third trimester

Suspected Fetal Macrosomia

- In the absence of any other indications, induction of labour should not be carried out simply because of suspicion a baby is large for gestational age (macrosomic

NICE Guideline

Care throughout labour

- Treat all women in labour with respect. Ensure that the woman is in control of and involved in what is happening to her and recognise that the way in which care is given is key to this.
- Encourage and help the woman to move and adopt whatever positions she finds most comfortable throughout labour
- Encourage the woman to have support from birth companion(s) of her choice.

Latent first stage of labour

- A period of time, not necessarily continuous, when:
  - there are painful contractions and
  - there is some cervical change, including cervical effacement and dilatation up to 4 cm

Initial assessment

Observations of the woman

- Review the antenatal notes (including all antenatal screening results) and discuss these with the woman.
- Ask her about the length, strength and frequency of her contractions.
- Ask her about any pain she is experiencing & discuss her options for pain relief.
- Record her pulse, blood pressure and temperature, and carry out urinalysis.
- Record if she has had any vaginal loss.

Observations of the unborn baby

- Ask the woman about the baby's movements in the last 24 hours.
- Palpate the woman's abdomen to determine the fundal height, the baby's lie, presentation, position, engagement of the presenting part, and frequency and duration of contractions.
- Auscultate the fetal heart rate for a minimum of 1 minute immediately after a contraction. Palpate the woman's pulse to differentiate between the heartbeats of the woman and the baby.

In addition,

- If there is uncertainty about whether the woman is in established labour, a vaginal examination may be helpful after a period of assessment,but is not always necessary.
- If the woman appears to be in established labour, offer a vaginal examination.

Intrapartum

Care in established labour

Support in labour

Provide a woman in established labour with supportive one-to-one care

Pain relief in labour

Non-regional Pain-relieving strategies

- If a woman chooses to use breathing and relaxation techniques in labour, support her in this choice.
- If a woman chooses to use massage techniques in labour that have been taught to birth companions, support her in this choice.
- Offer the woman the opportunity to labour in water for pain relief.

Non-pharmacological analgesia

- Do not offer transcutaneous electrical nerve stimulation (TENS) to women in established labour.

Inhalational analgesia Inhalational analgesia

- Ensure that Entonox (a 50:50 mixture of oxygen and nitrous oxide) is available in all birth settings as it may reduce pain in labour,but inform the woman that it may make her feel nauseous and light-headed.
- Ensure that pethidine, diamorphine or other opioids are available in all birth settings. Inform the woman that these will provide limited pain relief during labour and may have significant side effects for both her (drowsiness, nausea and vomiting) and her baby (short-term respiratory depression and drowsiness which may last several days).
- If an intravenous or intramuscular opioid is used, also administer an antiemetic.

Regional analgesia

- Provide information about epidural analgesia, including the following:
  - It is available only in obstetric units.
  - It provides more effective pain relief than opioids.
  - It is not associated with long-term backache.
  - It is not associated with a longer first stage of labour or an increased chance of a caesarean birth.
  - It is associated with a longer second stage of labour and an increased chance of vaginal instrumental birth.
  - It will be accompanied by a more intensive level of monitoring and intravenous access, and so mobility may be reduced.
- Timing of regional analgesia
  - If a woman in labour asks for regional analgesia, comply with her request. This includes women in severe pain in the latent first stage of labour
- Care and observations for women with regional analgesia
  - Always secure intravenous access before starting regional analgesia.
  - Preloading and maintenance fluid infusion need not be administered routinely before establishing low-dose epidural analgesia and combined spinal–epidural analgesia.
  - Undertake the following additional observations for women with regional analgesia:
  - During establishment of regional analgesia or after further boluses (10 ml or more of low-dose solutions), measure blood pressure every 5 minutes for 15 minutes.
  - If the woman is not pain-free 30 minutes after each administration of local anaesthetic/opioid solution, recall the anaesthetist.
  - Assess the level of the sensory block hourly.
  - Encourage women with regional analgesia to move and adopt whatever upright positions they find comfortable throughout labour.

- Once established, continue regional analgesia until after completion of the third stage of labour and any necessary perineal repair.
- Upon confirmation of full cervical dilatation in a woman with regional analgesia, unless the woman has an urge to push or the baby's head is visible, pushing should be delayed for at least 1 hour and longer if the woman wishes, after which actively encourage her to push during contractions.
- After diagnosis of full dilatation in a woman with regional analgesia, agree a plan with the woman in order to ensure that birth will have occurred within 4 hours regardless of parity.
- Do not routinely use oxytocin in the second stage of labour for women with regional analgesia.
- Perform continuous cardiotocography for at least 30 minutes during establishment of regional analgesia and after administration of each further bolus of 10 ml or more

- Establishing and maintaining regional analgesia
  - Use either epidural or combined spinal–epidural analgesia for establishing regional analgesia in labour.
  - If rapid analgesia is required, use combined spinal–epidural analgesia with bupivacaine and fentanyl.
  - Establish epidural analgesia with a low-concentration local anaesthetic and opioid solution with, for example, 10–15 ml of 0.0625–0.1% bupivacaine with 1–2 micrograms per ml fentanyl.
  - Use low-concentration local anaesthetic and opioid solutions (0.0625–0.1% bupivacaine or equivalent combined with 2.0 micrograms per ml fentanyl) for maintaining epidural analgesia in labour.
  - Do not use high concentrations of local anaesthetic solutions (0.25% or above of bupivacaine or equivalent) routinely for either establishing or maintaining epidural analgesia.
  - Either patient-controlled epidural analgesia or intermittent bolus given by healthcare professionals are the preferred modes of administration for maintenance of epidural analgesia

- Either patient-controlled epidural analgesia or intermittent bolus given by healthcare professionals are the preferred modes of administration for maintenance of epidural analgesia

Monitoring during labour

Measuring fetal heart rate

- Do not offer cardiotocography to women at low risk of complications in established labour.
- Offer intermittent auscultation of the fetal heart rate to women at low risk of complications in established first stage of labour: Use either a Pinard stethoscope or doppler ultrasound.
- Carry out intermittent auscultation immediately after a contraction for at least 1 minute, at least every 15 minutes, and record it as a single rate.
- Record accelerations and decelerations if heard.
- Palpate the maternal pulse hourly, or more often if there are any concerns, to differentiate between the maternal and fetal heartbeat.
- Advise continuous cardiotocography if any of the following risk factors are present at initial assessment or arise during labour:
  - maternal pulse over 120 beats/minute on 2 occasions 30 minutes apart
  - temperature of 38°C or above on a single reading, or 37.5°C or above on 2 consecutive occasions 1 hour apart
  - suspected chorioamnionitis or sepsis
  - pain reported by the woman that differs from the pain normally associated with contractions
  - the presence of significant meconium
  - fresh vaginal bleeding that develops in labour
  - severe hypertension: a single reading of either systolic blood pressure of 160 mmHg or more or diastolic blood pressure of 110 mmHg or more, measured between contractions

- hypertension: either systolic blood pressure of 140 mmHg or more or diastolic blood pressure of 90 mmHg or more on 2 consecutive readings taken 30 minutes apart, measured between contractions
- a reading of 2+ of protein on urinalysis and a single reading of either raised systolic blood pressure (140 mmHg or more) or raised diastolic blood pressure (90 mmHg or more)
- confirmed delay in the first or second stage of labour
- contractions that last longer than 60 seconds (hypertonus), or more than 5 contractions in 10 minutes (tachysystole)
- oxytocin use.

Cardiotocograph

Interpretation of cardiotocograph traces

Overall care

- Make a documented systematic assessment of the condition of the woman and unborn baby (including cardiotocography [CTG] findings) every hour, or more frequently if there are concerns.
- Do not make any decision about a woman's care in labour on the basis of CTG findings alone.
- Take into account the woman's preferences, any antenatal and intrapartum risk factors, the current wellbeing of the woman and unborn baby & the progress of labour.
- Ensure that the focus of care remains on the woman rather than the 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

- When reviewing the CTG trace, assess and document contractions and all 4 features of fetal heart rate: baseline rate; baseline variability; presence or absence of decelerations (and concerning characteristics of variable decelerations* if present); presence of accelerations.
- If there is a stable baseline fetal heart rate between 110 and 160 beats/minute and normal variability, continue usual care as the risk of fetal acidosis is low.
- If it is difficult to categorise or interpret a CTG trace, obtain a review by a senior midwife or a senior obstetrician.

Accelerations

- The presence of fetal heart rate accelerations, even with reduced baseline variability, is generally a sign that the baby is healthy.

Description of cardiotocograph trace features

Description	Feature		
	Baseline (beats/ minute)	Baseline variability (beats/ minute)	Decelerations
Reassuring	110 to 160	5 to 25	None or early Variable decelerations with no concerning characteristics* for less than 90minutes
Non-reassuring	100 to 109+ OR 161 to 180	Less than 5 For 30 to 50 minutes OR More than 25 for 15 to 25 minutes	Variable decelerations with no concerning characteristics* for 90 minutes or more OR Variable decelerations with any concerning characteristics* in up to 50% of contractions for 30 minutes or more OR Variable decelerations with any concerning characteristics* in over 50% of contractions for less than 30 minutes OR Late decelerations in over 50% of contractions for less than 30 minutes, with no maternal or fetal clinical risk factors such as vaginal bleeding or significant meconium
Abnormal	Below 100 OR Above 180	Less than 5 For more than 50 minutes OR More than 25 for more than 25 minutes OR Sinusoidal	Variable decelerations with any concerning characteristics* in over 50% of contractions for 30 minutes (or less if any maternal or fetal clinical risk factors [see above]) OR Late decelerations for 30 minutes (or less if any maternal or fetal clinical risk factors) OR Acute bradycardia, or a single prolonged deceleration lasting 3 minutes or more

Abbreviation: CTG, cardiotocography.
* Regard the following as concerning characteristics of variable decelerations: lasting more than 60 seconds; reduced baseline variability within the deceleration; failure to return to baseline; biphasic (W) shape; no shouldering.
† Although a baseline fetal heart rate between 100 and 109 beats/minute is a non-reassuring feature, continue usual care if there is normal baseline variability and no variable or late decelerations.

Management based on interpretation of cardiotocograph traces

Category	Definition	Management
Normal	All features are reassuring	• Continue CTG (unless it was started because of concerns arising from intermittent auscultation and there are no ongoing risk factors; see recommendation 1.10.8) and usual care • Talk to the woman and her birth companion(s) about what is happening
Suspicious	1 non - Reassuring feature AND 2 reassuring features	• Correct any underlying causes, such as hypotension or uterine hyperstimulation • Perform a full set of maternal observations • Start 1 or more conservative measures* • Inform an obstetrician or a senior midwife • Document a plan for reviewing the whole clinical picture and the CTG findings • Talk to the woman and her birth companion(s) about what is happening and take her preferences into account
Pathological	1 abnormal feature OR 2 non - Reassuring feature	• Obtain a review by an obstetrician and a senior midwife • Exclude acute events (for example, cord prolapse, suspected placental abruption or suspected uterine rupture) • Correct any underlying causes, such as hypotension or uterine hyperstimulation • Start 1 or more conservative measures* • Talk to the woman and her birth companion (s) about what is happening and take her preferences into account • If the cardiotocograph trace is still pathological after implementing conservative measures: – obtain a further review by an obstetrician and a senior midwife

Category	Definition	Management
		– offer digital fetal scalp stimulation (see recommendation 1.10.38) & document the outcome • If the cardiotocograph trace is still pathological after fetal scalp stimulation: – consider fetal blood sampling – consider expediting the birth – take the woman's preferences into account
Need for urgent intervention	Acute bradycardia, or a single prolonged deceleration for 3 minutes or more	• Urgently seek obstetric help • If there has been an acute event (for example, cord prolapse, suspected placental abruption or suspected uterine rupture), expedite the birth • Correct any underlying causes, such as hypotension or uterine hyperstimulation • Start 1 or more conservative measures* • Make preparations for an urgent birth • Talk to the woman and her birth companion(s) about what is happening and take her preferences into account • Expedite the birth if the acute bradycardia persists for 9 minutes • If the fetal heart rate recovers at any time up to 9 minutes, reassess any decision to expedite the birth, in discussion with the woman

Abbreviation: CTG, cardiotocography.

* If there are any concerns about the baby's wellbeing, be aware of the possible underlying causes and start one or more of the following conservative measures based on an assessment of the most likely cause(s): encourage the woman to mobilise or adopt an alternative position (and to avoid being supine); offer intravenous fluids if the woman is hypotensive; reduce contraction frequency by reducing or stopping oxytocin if it is being used and/or offering a tocolytic drug (a suggested regimen is subcutaneous terbutaline 0.25 mg).

Intrauterine resuscitation

- Do not use maternal facial oxygen therapy for intrauterine fetal resuscitation, because it may harm the baby (but it can be used where it is administered for maternal indications such as hypoxia or as part of preoxygenation before a potential anaesthetic).
- Do not offer amnioinfusion for intrauterine fetal resuscitation.

Fetal Scalp Stimulation

- If the cardiotocograph trace is pathological - offer digital fetal scalp stimulation.
- If this leads to an acceleration in fetal heart rate, only continue with fetal blood sampling if the cardiotocograph trace is still pathological.
- If digital fetal scalp stimulation (during vaginal examination) leads to an acceleration in fetal heart rate, regard this as a sign that the baby is healthy. Take this into account when reviewing the whole clinical picture.

Fetal Blood Sampling

- Do not carry out fetal blood sampling if:
  - There is an acute event (for example, cord prolapse, suspected placental abruption or suspected uterine rupture) or
  - The whole clinical picture indicates that the birth should be expedited
  - Contraindications are present, including risk of maternal-to-fetal transmission of infection or risk of fetal bleeding disorders.
- Be aware that for women with sepsis or significant meconium, fetal blood sample results may be falsely reassuring, & always discuss with a consultant obstetrician: whether fetal blood sampling is appropriate any results from the procedure if carried out.
- Before carrying out or repeating fetal blood sampling, start conservative measures and offer digital fetal scalp stimulation
- Only continue with fetal blood sampling if the cardiotocograph trace remains pathological
- When considering fetal blood sampling, take into account the woman's preferences and the whole clinical picture.

- Use the following classifications for fetal blood sample results:

  pH:

  - normal: 7.25 or above
  - borderline: 7.21 to 7.24

  abnormal: 7.20 or below or

  lactate:

  - normal: 4.1 mmol/l or below

  borderline: 4.2 to 4.8 mmol/l

  - abnormal: 4.9 mmol/l or above.

- Interpret fetal blood sample results taking into account:
  - any previous pH or lactate measurement and
  - the clinical features of the woman and baby, such as rate of progress in labour.
- If the fetal blood sample result is abnormal:
  - Expedite the birth
- If the fetal blood sample result is borderline and there are no accelerations in response to fetal scalp stimulation, consider taking a second fetal blood sample no more than 30 minutes later if this is still indicated by the cardiotocograph trace.
- If the fetal blood sample result is normal and there are no accelerations in response to fetal scalp stimulation, consider taking a second fetal blood sample no more than 1 hour later if this is still indicated by the cardiotocograph trace.
- When a fetal blood sample cannot be obtained
- If fetal blood sampling is attempted and a sample cannot be obtained, but the associated fetal scalp stimulation results in a fetal heart rate acceleration, decide whether to continue the labour or expedite the birth in light of the clinical circumstances and in discussion with the woman and a senior obstetrician.
- If fetal blood sampling is attempted but a sample cannot be obtained and there has been no improvement in the cardiotocograph trace, expedite the birth

First stage of labour

- Established first stage of labour – when: - there are regular painful contractions & there is progressive cervical dilatation from 4 cm
  - first labours last on average 8 hours and are unlikely to last over 18 hours
  - second and subsequent labours last on average 5 hours and are unlikely to last over 12 hours.
- Use a pictorial record of labour (partogram) once labour is established.
- Where the partogram includes an action line, use the World Health Organization recommendation of a 4-hour action line
- Record the following observations during the first stage of labour:
- half-hourly documentation of frequency of contractions
- hourly pulse
- 4-hourly temperature and blood pressure
- frequency of passing urine
- offer a vaginal examination 4-hourly or if there is concern about progress or in response to the woman's wishes (after abdominal palpation and assessment of vaginal loss).

Possible routine interventions in the first stage

- Do not routinely offer the package known as active management of labour (one-to-one continuous support; strict definition of established labour; early routine amniotomy; routine 2-hourly vaginal examination; oxytocin if labour becomes slow).
- In normally progressing labour, do not perform amniotomy routinely.
- Do not use combined early amniotomy with use of oxytocin routinely.

Delay in the first stage

If delay in the established first stage is suspected, assess all aspects of progress in labour when diagnosing delay, including:

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

- cervical dilatation of less than 2 cm in 4 hours or a slowing in the progress of labour for second or subsequent labours
- descent and rotation of the baby's head
- changes in the strength, duration and frequency of uterine contractions.
- If delay in the established first stage of labour is suspected, amniotomy should be considered for all women with intact membranes, after explanation of the procedure and advice that it will shorten her labour by about an hour and may increase the strength and pain of her contractions.
- Whether or not a woman has agreed to an amniotomy, advise all women with suspected delay in the established first stage of labour to have a vaginal examination 2 hours later, and diagnose delay if progress is less than 1 cm.
- For women with intact membranes in whom delay in the established first stage of labour is confirmed, advise the woman to have an amniotomy, and to have a repeat vaginal examination 2 hours later whether her membranes are ruptured or intact.
- Inform the woman that oxytocin will increase the frequency and strength of her contractions and that its use will mean that her baby should be monitored continuously. Offer the woman an epidural before oxytocin is started.
- If oxytocin is used, ensure that the time between increments of the dose is no more frequent than every 30 minutes. Increase oxytocin until there are 4–5 contractions in 10 minutes.
- Advise the woman to have a vaginal examination 4 hours after starting oxytocin in established labour
- If cervical dilatation has increased by less than 2 cm after 4 hours of oxytocin, further obstetric review is required to assess the need for caesarean section.
- If cervical dilatation has increased by 2 cm or more, advise 4-hourly vaginal examinations.

Second stage of labour

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

Observations during the second stage

Carry out the following observations in the second stage of labour, record all observations on the partogram

- half-hourly documentation of the frequency of contractions
- hourly blood pressure
- continued 4-hourly temperature
- frequency of passing urine
- offer a vaginal examination hourly in the active second stage, or in response to the woman's wishes (after abdominal palpation and assessment of vaginal loss).
- Perform intermittent auscultation of the fetal heart rate immediately after a contraction for at least 1 minute, at least every 5 minutes. Palpate the woman's pulse every 15 minutes to differentiate between the two heartbeats.
- Ongoing consideration should be given to the woman's position, hydration, coping strategies and pain relief throughout the second stage.

Duration of the second stage and definition of delay

For a nulliparous woman

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

For a multiparous woman

- birth would be expected to take place within 2 hours of the start of the active second stage in most women

- diagnose delay in the active second stage when it has lasted 2 hours and refer the woman to a healthcare professional trained to undertake an operative vaginal birth if birth is not imminent.

For a multiparous woman

- birth would be expected to take place within 2 hours of the start of the active second stage in most women
- diagnose delay in the active second stage when it has lasted 1 hour and refer the woman to a healthcare professional trained to undertake an operative vaginal birth if birth is not imminent.
- For a nulliparous woman, suspect delay if progress (in terms of rotation and/or descent of the presenting part) is inadequate after 1 hour of active second stage. Offer vaginal examination and then offer amniotomy if the membranes are intact.
- For a multiparous woman, suspect delay if progress (in terms of rotation and/or descent of the presenting part) is inadequate after 30 minutes of active second stage. Offer vaginal examination and then offer amniotomy if the membranes are intact.
- If full dilatation of the cervix has been confirmed in a woman without regional analgesia, but she does not get an urge to push, carry out further assessment after 1 hour.

Oxytocin in the second stage

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

Position and pushing in the second stage

- Discourage the woman from lying supine or semi-supine in the second stage of labour and encourage her to adopt any other position that she finds most comfortable.
- Inform the woman that in the second stage she should be guided by her own urge to push.
- If pushing is ineffective or if requested by the woman, offer strategies to assist birth, such as support, change of position, emptying of the bladder and encouragement.

Intrapartum interventions to reduce perineal trauma

- Do not perform perineal massage in the second stage of labour.
- Either the 'hands on' (guarding the perineum and flexing the baby's head) or the

Intrapartum interventions to reduce perineal trauma

- Do not perform perineal massage in the second stage of labour.
- Either the 'hands on' (guarding the perineum and flexing the baby's head) or the 'hands poised' (with hands off the perineum and baby's head but in readiness) technique can be used to facilitate spontaneous birth.
- Do not offer lidocaine spray to reduce pain in the second stage of labour.
- Do not carry out a routine episiotomy during spontaneous vaginal birth.
- Inform any woman with a history of severe perineal trauma that her risk of repeat severe perineal trauma is not increased in a subsequent birth, compared with women having their first baby.
- Do not offer episiotomy routinely at vaginal birth after previous third- or fourth-degree trauma.
- In order for a woman who has had previous third- or fourth-degree trauma to make an informed choice, talk with her about the future mode of birth, encompassing:
  - current urgency or incontinence symptoms
  - the degree of previous trauma
  - risk of recurrence
  - the success of the repair undertaken
  - the psychological effect of the previous trauma
  - management of her labour.
- Inform any woman with infibulated genital mutilation of the risks of difficulty with vaginal examination, catheterisation and application of fetal scalp electrodes. Inform her of the risks of delay in the second stage and spontaneous laceration together with the need for an anterior episiotomy and the possible need for defibulation in labour.
- If an episiotomy is performed, the recommended technique is a mediolateral episiotomy originating at the vaginal fourchette and usually directed to the right side. The angle to the vertical axis should be between 45 and 60 degrees at the time of the episiotomy.
- Perform an episiotomy if there is a clinical need, such as instrumental birth or suspected fetal compromise.
- Provide tested effective analgesia before carrying out an episiotomy, except in an emergency because of acute fetal compromise.

Water birth

- Inform women that there is insufficient high-quality evidence to either support or discourage giving birth in water.

Delay in the second stage

- If there is delay in the second stage of labour, or if the woman is excessively distressed, support and sensitive encouragement and the woman's need for analgesia/anaesthesia are particularly important.
- An obstetrician should assess a woman with confirmed delay in the second stage before contemplating the use of oxytocin.
- After initial obstetric assessment of a woman with delay in the second stage, maintain ongoing obstetric review every 15–30 minutes.

Instrumental birth and delayed second stage

- Think about offering instrumental birth if there is concern about the baby's wellbeing or there is a prolonged second stage.
- Recognise that, on rare occasions, the woman's need for help in the second stage may be an indication to assist by offering instrumental birth when supportive care has not helped.

Third stage of labour

Definition of third stage

- The third stage of labour is the time from the birth of the baby to the expulsion of the placenta and membranes.

Active management of the third stage

- Involves a package of care comprising the following components: - routine use of uterotonic drugs - deferred clamping and cutting of the cord - controlled cord traction after signs of separation of the placenta.

Physiological management of the third stage

- involves a package of care that includes the following components: - no routine use of uterotonic drugs - no clamping of the cord until pulsation has stopped - delivery of the placenta by maternal effort.

Prolonged third stage

Diagnose a prolonged third stage of labour if it is not completed within 30 minutes of the birth with active management or within 60 minutes of the birth with physiological management.

Observations in the third stage

Record the following observations for a woman in the third stage of labour:

- her general physical condition, as shown by her colour, respiration and her own report of how she feels
- vaginal blood loss.

If there is postpartum haemorrhage, a retained placenta or maternal collapse, or any other concerns about the woman's wellbeing: carry out frequent observations to assess whether resuscitation is needed.

Active and physiological management of the third stage

Advise the woman to have active management of the third stage, because it is associated with a lower risk of a postpartum haemorrhage and/or blood transfusion.

- If a woman at low risk of postpartum haemorrhage requests physiological management of the third stage, support her in her choice.
- For active management, administer 10 IU of oxytocin by intramuscular injection with the birth of the anterior shoulder or immediately after the birth of the baby and before the cord is clamped and cut. Use oxytocin as it is associated with fewer side effects than oxytocin plus ergometrine.
- After administering oxytocin, clamp and cut the cord. Do not clamp the cord earlier than 1 minute from the birth of the baby unless there is concern about the integrity of the cord or the baby has a heart rate below 60 beats/ minute that is not getting faster. Clamp the cord before 5 minutes in order to perform controlled cord traction as part of active management. If the woman requests that the cord is clamped and cut later than 5 minutes, support her in her choice.
- After cutting the cord, use controlled cord traction. Perform controlled cord traction as part of active management only after administration of oxytocin and signs of separation of the placenta.
- Record the timing of cord clamping in both active and physiological management.
- Advise a change from physiological management to active management if either of the following occur: haemorrhage the placenta is not delivered within 1 hour of the birth of the baby.
- Do not use either umbilical oxytocin infusion or prostaglandin routinely in the third stage of labour.

Retained placenta

- Secure intravenous access if the placenta is retained, and explain to the woman why this is needed.
- Do not use umbilical vein agents if the placenta is retained.
- Do not use intravenous oxytocic agents routinely to deliver a retained placenta.
- Give intravenous oxytocic agents if the placenta is retained and the woman is bleeding excessively.
- If the placenta is retained and there is concern about the woman's condition: offer a vaginal examination to assess the need to undertake manual removal of the placenta explain that this assessment can be painful and advise her to have analgesia.

- If the woman reports inadequate analgesia during the assessment, stop the examination and address this immediately.
- Do not carry out uterine exploration or manual removal of the placenta without an anaesthetic.

Initial assessment

- Carry out the following observations of the woman after birth:
- Record her temperature, pulse and blood pressure, uterine contraction and lochia.
- Examine the placenta and membranes: assess their condition, structure, cord vessels and completeness
- Early assessment of the woman's emotional and psychological condition in response to labour and birth.
- Successful voiding of the bladder.

Perineal care

- Define perineal or genital trauma caused by either tearing or episiotomy as follows:
- First degree – injury to skin only
- Second degree – injury to the perineal muscles but not the anal sphincter
- Third degree – injury to the perineum involving the anal sphincter complex:
  - 3a – less than 50% of external anal sphincter thickness torn
  - 3b – more than 50% of external anal sphincter thickness torn
  - 3c – internal anal sphincter torn.
  - Fourth degree – injury to the perineum involving the anal sphincter complex (external and internal anal sphincter) and anal epithelium.
- Before assessing for genital trauma:
- Explain to the woman what is planned and why
- Offer inhalational analgesia
- Ensure good lighting
- Position the woman so that she is comfortable and so that the genital structures can be seen clearly.

- When carrying out perineal repair: ensure that tested effective analgesia is in place, using infiltration with up to 20 ml of 1% lidocaine or equivalent top up the epidural or insert a spinal anaesthetic if necessary.
- Undertake perineal repair using a continuous non-locked suturing technique for the vaginal wall and muscle layer. Use an absorbable synthetic suture material to suture the perineum.
- Offer rectal non-steroidal anti-inflammatory drugs routinely after perineal repair of first- and second-degree trauma provided these drugs are not contraindicated.
- Observe the following basic principles when performing perineal repairs:
- Repair perineal trauma using aseptic techniques.
  - Check equipment and count swabs and needles before and after the procedure.
  - Good lighting is essential to see and identify the structures involved.
  - Ensure that difficult trauma is repaired by an experienced practitioner in theatre under regional or general anaesthesia.
  - Insert an indwelling catheter for 24 hours to prevent urinary retention.
  - Ensure that good anatomical alignment of the wound is achieved and that consideration is given to the cosmetic results.
  - Carry out rectal examination after completing the repair to ensure that suture material has not been accidentally inserted through the rectal mucosa.
  - After completion of the repair, document an accurate detailed account covering the extent of the trauma, the method of repair and the materials used.
  - Give the woman information about the extent of the trauma, pain relief, diet, hygiene and the importance of pelvic-floor exercises

RCOG Green Top Guideline

- The goal of assisted vaginal birth is to mimic spontaneous vaginal birth, thereby expediting birth with a minimum of maternal or neonatal morbidity.
- Non-rotational low-pelvic and lift out assisted vaginal births - low probability of failure and most procedures can be conducted safely in a birth room.
- Assisted vaginal births that have a higher risk of failure should be considered a trial and be attempted in a place where immediate recourse to caesarean birth can be undertaken.
- Higher rates of failure are associated with:
  - Maternal BMI greater than 30
  - Short maternal stature
  - Estimated fetal weight of greater than 4 kg or a clinically big baby
  - Head circumference above the 95th percentile
  - Occipito–posterior position
  - Midpelvic birth or when one-fifth of the head is palpable per abdomen.
- Operators should be aware that forceps and vacuum extraction are associated with different benefits and risks; failure to complete the birth with a single instrument is more likely with vacuum extraction, but maternal perineal trauma is more likely with forceps.
- Birth by vacuum and forceps can be associated with significant perinatal complications.
- Neonatal intracranial and subgaleal haemorrhage are life-threatening complications of particular concern.
- Soft cup vacuum extractors have a higher rate of failure but a lower incidence of neonatal scalp trauma.

Vaccum

- The rapid negative pressure application for vacuum-assisted birth is recommended as it reduces the duration of the procedure with no difference in maternal and neonatal outcomes.
- An episiotomy should be performed if the perineum is very resistant.

- Complete vacuum-assisted birth in the majority of cases with a maximum of three pulls to bring the fetal head on to the perineum. Three additional gentle pulls can be used to ease the head out of the perineum.
- If there is minimal descent with the first two pulls of a vacuum, the operator should consider whether the application is suboptimal, the fetal position has been incorrectly diagnosed or there is cephalopelvic disproportion.
- Discontinue vacuum-assisted birth
  - no evidence of progressive descent with moderate traction during each pull of a correctly applied instrument by an experienced operator.
  - if there have been two 'pop-offs' of the instrument.
- An increasing number of 'pop-offs' is associated with failed assisted vaginal birth
- The use of outlet or low-cavity forceps following failed vacuum extraction may be judicious in avoiding a potentially complex caesarean birth.

Forceps

- Discontinue attempted forceps birth where
  - Forceps cannot be applied easily,
  - Handles do not approximate easily
  - Lack of progressive descent with moderate traction
  - if birth is not imminent following three pulls of a correctly applied instrument by an experienced operator
- Discontinue rotational forceps birth if rotation is not easily achieved with gentle pressure.
- There is potential neonatal morbidity following a failed attempt at forceps birth
- Obstetricians should be aware of the increased risk of fetal head impaction at caesarean birth following a failed forceps and should be prepared to disimpact the fetal head using recognised manoeuvres.

Sequential instruments

- The use of sequential instruments is associated with an increased risk of trauma to the infant.

- There is increased neonatal morbidity following failed vacuum-assisted birth and/or sequential use of instruments.
- There is increased risk of obstetric anal sphincter injury (OASI) following sequential use of instruments.
- The use of sequential instruments has been associated with an increase in the incidence of third- and fourth-degree tears.

Vacuum extraction as compared with forceps assisted birth

- More likely to
  - fail at achieving vaginal birth
  - be associated with cephalhaematoma
  - be associated with retinal haemorrhage
  - be associated with maternal worries about baby
- Less likely to be associated with significant maternal perineal and vaginal trauma
- No more likely to be associated with
  - birth by caesarean birth
  - low 5 min Apgar scores
  - need for phototherapy

Maternal outcome

Maternal outcome	Vaccum	Forceps
Episiotomy	50–60%	≥90%.
Significant vulvo–vaginal tear	10%	20%
OASI	1–4%	8–12%.
Postpartum haemorrhage	10–40%.	10–40%.

- Urinary or bowel incontinence; common at 6 weeks, improves over time.

Perinatal outcome

- Cephalhaematoma - predominantly vacuum, 1–12%.
- Facial or scalp lacerations - vacuum and forceps, 10%.
- Retinal haemorrhage - more common with vacuum than forceps, variable 17–38%.
- Jaundice or hyperbilirubinaemia - vacuum and forceps, 5–15%.
- Subgaleal haemorrhage - predominantly vacuum, 3 to 6 in 1000.
- Intracranial haemorrhage- vacuum and forceps, 5 to 15 in 10 000.
- Cervical spine injury -mainly Kiellands rotational forceps, rare.
- Skull fracture- mainly forceps, rare.
- Facial nerve palsy - mainly forceps, rare.
- Fetal death - very rare.

Adverse outcomes of unsuccessful assisted vaginal birth-

- Major obstetric haemorrhage
- Shoulder dystocia
- Neonatal complications

Role of episiotomy in assisted vaginal birth

- Mediolateral episiotomy should be discussed with the woman as part of the preparation for assisted vaginal birth.
- When performing a mediolateral episiotomy the cut should be at a 60 degree angle initiated when the head is distending the perineum.

Prophylactic antibiotics

- A single prophylactic dose of intravenous amoxicillin and clavulanic acid should be recommended following assisted vaginal birth as it significantly reduces confirmed or suspected maternal infection compared to placebo.
- Good standards of hygiene and aseptic techniques are recommended.

Thromboprophylaxis

- Reassess women after assisted vaginal birth for venous thromboembolism risk and the need for thromboprophylaxis.

Analgesia after birth

- In the absence of contraindications, women should be offered regular nonsteroidal anti-inflammatory drugs (NSAIDs) and paracetamol routinely.

Care of the bladder after birth

- Women should be educated about the risk of urinary retention so that they are aware of the importance of bladder emptying in the postpartum period.
- The timing and volume of the first void urine should be monitored and documented.
- A post void residual should be measured if urinary retention is suspected.
- Offer women physiotherapy-directed strategies to reduce the risk of urinary incontinence at 3 months.
- Assisted vaginal birth, prolonged labour and epidural analgesia are associated with an increased risk of postpartum urinary retention (PUR), which can be associated with long-term bladder dysfunction.

Psychological morbidity

- Shared decision making, good communication, and positive continuous support during labour and birth have the potential to reduce psychological morbidity following birth.

Information for future births

- Inform women that there is a high probability of a spontaneous vaginal birth in subsequent labours following assisted vaginal birth.
- Individualise care for women who have sustained a third- or fourth-degree perineal tear, or who have ongoing pelvic floor morbidity
- The future plan of care should be reviewed carefully with women who have experienced a third- or fourth-degree tear, particularly if they are symptomatic, as they may be at increased risk of further anorectal damage with a subsequent birth. Women should be counselled regarding the risk of recurrence and implications for future childbirth

NICE Guideline

Timing of planned CS

The risk of respiratory morbidity is increased in babies born by CS before labour, but this risk decreases significantly after 39 weeks. Therefore planned CS should not routinely be carried out before 39 weeks

Classification of urgency

The urgency of CS should be documented using the following standardised scheme in order to aid clear communication between healthcare professionals about the urgency of a CS:

1. Immediate threat to the life of the woman or fetus
2. Maternal or fetal compromise which is not immediately life-threatening Caesarean section
3. No maternal or fetal compromise but needs early delivery
4. Delivery timed to suit woman or staff

Decision-to-delivery interval for unplanned CS

- Perform category 1 and 2 CS as quickly as possible after making the decision, particularly for category 1.
- Perform category 2 CS in most situations within 75 minutes of making the decision.
- Take into account the condition of the woman and the unborn baby when making decisions about rapid delivery. Remember that rapid delivery may be harmful in certain circumstances.

Preoperative testing and preparation for CS

- Pregnant women should be offered a haemoglobin assessment before CS to identify those who have anaemia. Although blood loss of more than 1000 ml is infrequent after CS (it occurs in 4–8% of CS) it is a potentially serious complication
- Pregnant women having CS for antepartum haemorrhage, abruption, uterine rupture and placenta praevia are at increased risk of blood loss of more than 1000 ml and should have the CS carried out at a maternity unit with on-site blood transfusion services.

- Pregnant women who are healthy and who have otherwise uncomplicated pregnancies should not routinely be offered the following tests before CS:
  - grouping and saving of serum
  - cross-matching of blood
  - a clotting screen
  - preoperative ultrasound for localisation of the placenta, because this does not improve CS morbidity outcomes (such as blood loss of more than 1000 ml, injury of the infant, and injury to the cord or to other adjacent structures).

Women having CS with regional anaesthesia require an indwelling urinary catheter to prevent over-distension of the bladder because the anaesthetic block interferes with normal bladder function.

Anaesthesia for CS

- Pregnant women having a CS should be given information on different types of post-CS analgesia so that analgesia best suited to their needs can be offered
- Women who are having a CS should be offered regional anaesthesia because it is safer and results in less maternal and neonatal morbidity than general anaesthesia. This includes women who have a diagnosis of placenta praevia.
- Women who are having induction of regional anaesthesia for CS should be cared for in theatre because this does not increase women's anxiety.
- Women who are having a CS under regional anaesthesia should be offered intravenous ephedrine or phenylephrine, and volume pre-loading with crystalloid or colloid to reduce the risk of hypotension occurring during CS.
- Each maternity unit should have a drill for failed intubation during obstetric anaesthesia.
- To reduce the risk of aspiration pneumonitis women should be offered antacids and drugs (such as H2 receptor antagonists or proton pump inhibitors) to reduce gastric volumes and acidity before CS.

- Women having a CS should be offered antiemetics (either pharmacological or acupressure) to reduce nausea and vomiting during CS.
- General anaesthesia for unplanned CS should include preoxygenation, cricoid pressure and rapid sequence induction to reduce the risk of aspiration.
- Intravenous ephedrine or phenylephrine should be used in the management of hypotension during CS.
- The operating table for CS should have a lateral tilt of 15°, because this reduces maternal hypotension.

Surgical techniques for CS

Methods to prevent HIV transmission in theatre

- Healthcare professionals should wear double gloves when performing or assisting at CS on women who have tested positive for HIV, to reduce the risk of HIV infection of healthcare professionals during surgery.
- General recommendations for safe surgical practice should be followed at CS to reduce the risk of HIV infection of staff.

Abdominal wall incision

- CS should be performed using a transverse abdominal incision because this is associated with less postoperative pain and an improved cosmetic effect compared with a midline incision.
- The transverse incision of choice should be the Joel Cohen incision (a straight skin incision, 3 cm above the symphysis pubis; subsequent tissue layers are opened bluntly and, if necessary, extended with scissors and not a knife), because it is associated with shorter operating times and reduced postoperative febrile morbidity.

Instruments for skin incision

- The use of separate surgical knives to incise the skin and the deeper tissues at Caesarean section is not recommended because it does not decrease wound infection.

Extension of the uterine incision

- When there is a well formed lower uterine segment, blunt rather than sharp extension of the uterine incision should be used because it reduces blood loss, incidence of postpartum haemorrhage and the need for transfusion at CS.

Fetal laceration

- Women who are having a CS should be informed that the risk of fetal lacerations is about 2%.

Use of forceps

- Forceps should only be used at CS if there is difficulty delivering the baby's head. The effect on neonatal morbidity of the routine use of forceps at CS remains uncertain.

Use of uterotonics

- Oxytocin 5 IU by slow intravenous injection should be used at CS to encourage contraction of the uterus and to decrease blood loss.

Method of placental removal

- At CS, the placenta should be removed using controlled cord traction and not manual removal as this reduces the risk of endometritis.

Exteriorisation of the uterus

- Intraperitoneal repair of the uterus at CS should be undertaken.
- Exteriorisation of the uterus is not recommended because it is associated with more pain and does not improve operative outcomes such as haemorrhage and infection.

Closure of the uterus

- The effectiveness and safety of single layer closure of the uterine incision is uncertain. Except within a research context, the uterine incision should be sutured with two layers.

Closure of the peritoneum

- Neither the visceral nor the parietal peritoneum should be sutured at CS because this reduces operating time and the need for postoperative analgesia, and improves maternal satisfaction.

Closure of the abdominal wall

- In the rare circumstances that a midline abdominal incision is used at CS, mass closure with slowly absorbable continuous sutures should be used because this results in fewer incisional hernias and less dehiscence than layered closure.

Closure of subcutaneous tissue

- Routine closure of the subcutaneous tissue space should not be used, unless the woman has more than 2 cm subcutaneous fat, because it does not reduce the incidence of wound infection.

Use of superficial wound drains

- Superficial wound drains should not be used at CS because they do not decrease the incidence of wound infection or wound haematoma.

Umbilical artery pH measurement

- Umbilical artery pH should be performed after all CS for suspected fetal compromise, to allow review of fetal wellbeing and guide ongoing care of the baby.

Timing of antibiotic administration

- Offer women prophylactic antibiotics at CS before skin incision. Inform them that this reduces the risk of maternal infection more than prophylactic antibiotics given after skin incision, and that no effect on the baby has been demonstrated.
- Offer women prophylactic antibiotics at CS to reduce the risk of postoperative infections. Choose antibiotics effective against endometritis, urinary tract and wound infections, which occur in about 8% of women who have had a CS.
- Do not use co-amoxiclav when giving antibiotics before skin incision.

Thromboprophylaxis for CS

- Women having a CS should be offered thromboprophylaxis because they are at increased risk of venous thromboembolism. The choice of method of prophylaxis (for example, graduated stockings, hydration, early mobilisation, low molecular weight heparin) should take into account risk of thromboembolic disease and follow existing guidelines

Care of the baby born by CS

Presence of paediatrician at CS

- An appropriately trained practitioner skilled in the resuscitation of the newborn should be present at CS performed under general anaesthesia or where there is evidence of fetal compromise.

Thermal care for babies born by CS

- Babies born by CS are more likely to have a lower temperature, and thermal care should be in accordance with good practice for thermal care of the newborn baby

Maternal contact (skin-to-skin)

- Early skin-to-skin contact between the woman and her baby should be encouraged and facilitated because it improves maternal perceptions of the infant, mothering skills, maternal behaviour, and breastfeeding outcomes, and reduces infant crying.

Breastfeeding

- Women who have had a CS should be offered additional support to help them to start breastfeeding as soon as possible after the birth of their baby. This is because women who have had a CS are less likely to start breastfeeding in the first few hours after the birth, but, when breastfeeding is established, they are as likely to continue as women who have a vaginal birth.

Care of the woman after CS

- High dependency unit/intensive therapy unit admission
- Healthcare professionals caring for women after CS should be aware that, although it is rare for women to need intensive care following childbirth, this occurs more frequently after CS (about 9 per 1000).

Routine monitoring after CS

- After CS, women should be observed on a one-to-one basis by a properly trained member of staff until they have regained airway control and cardiorespiratory stability and are able to communicate.
- After recovery from anaesthesia, observations (respiratory rate, heart rate, blood pressure, pain and sedation) should be continued every half hour for 2 hours, and hourly thereafter provided that the observations are stable or satisfactory. If these observations are not stable, more frequent observations and medical review are recommended.

- For women who have had intrathecal opioids, there should be a minimum hourly observation of respiratory rate, sedation and pain scores for at least 12 hours for diamorphine and 24 hours for morphine.
- For women who have had epidural opioids or patient-controlled analgesia with opioids, there should be routine hourly monitoring of respiratory rate, sedation and pain scores throughout treatment and for at least 2 hours after discontinuation of treatment.

Pain management after CS

- Providing there is no contraindication, non-steroidal anti-inflammatory drugs should be offered post-CS as an adjunct to other analgesics, because they reduce the need for opioids.

Early eating and drinking after CS

- Women who are recovering well after CS and who do not have complications can eat and drink when they feel hungry or thirsty.

Urinary catheter removal after CS

- Removal of the urinary bladder catheter should be carried out once a woman is mobile after a regional anaesthetic and not sooner than 12 hours after the last epidural 'top up' dose.

Respiratory physiotherapy after CS

- Routine respiratory physiotherapy does not need to be offered to women after a CS under general anaesthesia, because it does not improve respiratory outcomes such as coughing, phlegm, body temperature, chest palpation and auscultatory changes.

Length of hospital stay and readmission to hospital

- Length of hospital stay is likely to be longer after a CS (an average of 3–4 days) than after a vaginal birth (average 1–2 days). However, women who are recovering well, are apyrexial and do not have complications following CS should be offered early discharge (after 24 hours) from hospital and follow-up at home, because this is not associated with more infant or maternal readmissions.

Recovery following CS

- In addition to general postnatal care, women who have had a CS should be provided with: specific care related to recovery after CS care related to management of other complications during pregnancy or childbirth.
- Women who have a CS should be prescribed and encouraged to take regular analgesia for postoperative pain, taking account of potential harms of some analgesics in women who choose to breastfeed.
- CS wound care should include: removing the dressing 24 hours after the CS specific monitoring for fever assessing the wound for signs of infection (such as increasing pain, redness or discharge), separation or dehiscence encouraging the woman to wear loose, comfortable clothes and cotton underwear gently cleaning and drying the wound daily if needed, planning the removal of sutures or clips
- Healthcare professionals caring for women who have had a CS and who have urinary symptoms should consider the possible diagnosis of: urinary tract infection stress incontinence (occurs in about 4% of women after CS) urinary tract injury (occurs in about 1 per 1000 CS).
- Healthcare professionals caring for women who have had a CS and who have heavy and/or irregular vaginal bleeding should consider that this is more likely to be due to endometritis than retained products of conception.
- Women who have had a CS are at increased risk of thromboembolic disease (both deep vein thrombosis and pulmonary embolism), so healthcare professionals need to pay particular attention to women who have chest symptoms (such as cough or shortness of breath) or leg symptoms (such as painful swollen calf).
- Women who have had a CS should resume activities such as driving a vehicle, carrying heavy items, formal exercise & sexual intercourse once they have fully recovered from the CS (including any physical restrictions or distracting effect due to pain).
- Healthcare professionals caring for women who have had a CS should inform women that after a CS they are not at increased risk of difficulties with breastfeeding, depression, post-traumatic stress symptoms, dyspareunia and faecal incontinence.
- While women are in hospital after having a CS, give them the opportunity to discuss with healthcare professionals the reasons for the CS and provide both verbal and printed information about birth options for any future pregnancies. If the woman prefers, provide this at a later date

WHO manual 2007

	Mild pre-eclampsia	Serve pre-eclampsia
Diastolic blood pressure	<110	110
Proteinuria	Up to 2+	3+ or more
Headache	No	One or more of these
Visual disturbances	No	conditions may be present
Hyperreflexia	No	
Urine output <400 ml	No	
Epigastric or right	No	
upper quadrant pain	No	
Pulmonary oedema		

Severe pre-eclampsia and eclampsia are managed similarly, with the exception that delivery must occur within 12 hours of the onset of convulsions in eclampsia.

All cases of severe pre-eclampsia should be managed actively. Symptoms and signs of "impending eclampsia" (blurred vision, hyperreflexia) are unreliable and expectant management is not recommended.

Eclampsia Management

- Make a quick assessment of the general condition of the woman, including vital signs (pulse, blood pressure, respiration) while simultaneously finding out the history of her present and past illnesses from her or her relatives:
  - Check airway and breathing
  - Position her on her side
  - Check for neck rigidity and temperature.
- If she is not breathing or her breathing is shallow:
  - Open airway and intubate, if required
  - Assist ventilation using an Ambu bag and mask
  - Give oxygen at 4–6 litres per minute.
- If she is breathing, give oxygen at 4–6 litres per minute by mask or nasal cannulae.
- If she is convulsing:
  - Protect her from injury, but do not actively restrain her
  - Position her on her side to reduce the risk of aspiration of secretions, vomit and blood
- After the convulsion, aspirate the mouth and throat as necessary. Look in the mouth for a bitten tongue: it may swell.

- Give magnesium sulfate. If a convulsion continues in spite of magnesium sulfate, consider diazepam 10 mg IV.
- If diastolic blood pressure remains above 110 mmHg, give antihypertensive drugs. Reduce the diastolic pressure to less than 100 mmHg, but not below 90 mmHg.
- Fluids:

  - Start an IV infusion

  - Maintain a strict fluid balance chart and monitor the volume of fluids administered and urine output to ensure that there is no fluid overload

  - Catheterize the bladder to monitor urine output and proteinuria

If urine output is less than 30 ml per hour:

- Withhold magnesium sulfate until urine output improves
- Infuse a maintenance dose of IV fluids (normal saline or Ringer's lactate) at 1 litres in 8 hours
- Monitor for the development of pulmonary oedema.

  - Never leave the woman alone. A convulsion followed by aspiration of vomit may cause death of the woman and fetus.
- Observe vital signs, reflexes and fetal heart rate hourly.
- Auscultate the lung bases hourly for rales indicating pulmonary oedema. If rales are heard, withhold fluids and give frusemide 40 mg IV once.
- Assess clotting status.
- Magnesium sulfate is the drug of first choice for preventing and treating convulsions in severe pre-eclampsia and eclampsia.

Magnesium sulfate schedules for severe pre-eclampsia and eclampsia

Loading dose

- Magnesium sulfate 20% solution 4 g IV over 5 minutes
- Follow promptly with 10 g of 50% magnesium sulfate solution, 5 g in each buttock, as deep IM injection with 1.0 ml of 2% lidocaine in the same syringe
- If convulsions recur after 15 minutes, give 2 g magnesium sulfate (50% solution) IV over 5 minutes

Practical tip- 50% MgSo4 contains 1 gm in 2ml. So loading dose is 4 gm= 4 amp= 8ml. As we have to prepare 20 ml, add 12 ml of distilled water to make 20 ml 20%. Give this solution slowly over 5 min.

IM dose of 5gm is to be given undiluted.

Maintenance dose

- 5 g magnesium sulfate (50% solution) + 1 ml lidocaine 2% IM every 4 hours into alternate buttocks
- Continue treatment with magnesium sulfate for 24 hours after delivery or the last convulsion, whichever occurs last.
- Before repeat administration, ensure that
  - Respiratory rate is at least 16 per minute
  - Patellar reflexes are present
  - Urinary output is at least 30 ml per hour over the last 4 hours
- Withhold or delay drug if:
  - Respiratory rate falls below 16 per minute
  - Patellar reflexes are absent
  - Urinary output falls below 30 ml per hour over preceding 4 hours
- In case of respiratory arrest:
  - Assist ventilation (mask and bag; anaesthesia apparatus; intubation)
  - Give calcium gluconate 1 gm (10 ml of 10% solution) IV slowly until the drug antagonizes the effects of magnesium sulfate and respiration begins

IV Diazepam schedules for severe pre-eclampsia and eclampsia

Loading dose

- Diazepam 10 mg IV (intravenous) slowly over 2 minutes
- If convulsions recur, repeat loading dose

Maintenance dose

- Diazepam 40 mg in 500 ml IV fluids (normal saline or Ringer's lactate) titrated to keep the patient sedated but rousable
- Do not give more than 100 mg in 24 hours

Use diazepam only if magnesium sulfate is not available

Antihypertensive drugs

- If the diastolic pressure is 110 mmHg or more, give antihypertensive drugs.
- Goal is to keep the diastolic pressure between 90 mmHg and 100 mmHg to prevent cerebral haemorrhage. Avoid hypotension.
- Hydralazine is the drug of choice:

1. Give hydralazine 5 mg IV slowly every 5 minutes until blood pressure is lowered. Repeat hourly as needed or give hydralazine 12.5 mg IM every 2 hours as needed.

2. If hydralazine is not available:

- Give labetolol 10 mg IV:

  – If response is inadequate (diastolic blood pressure remains above 110 mmHg) after 10 minutes, give labetolol 20 mg IV

  – Increase dose to 40 mg and then 80 mg if satisfactory response is not obtained within 10 minutes of each dose

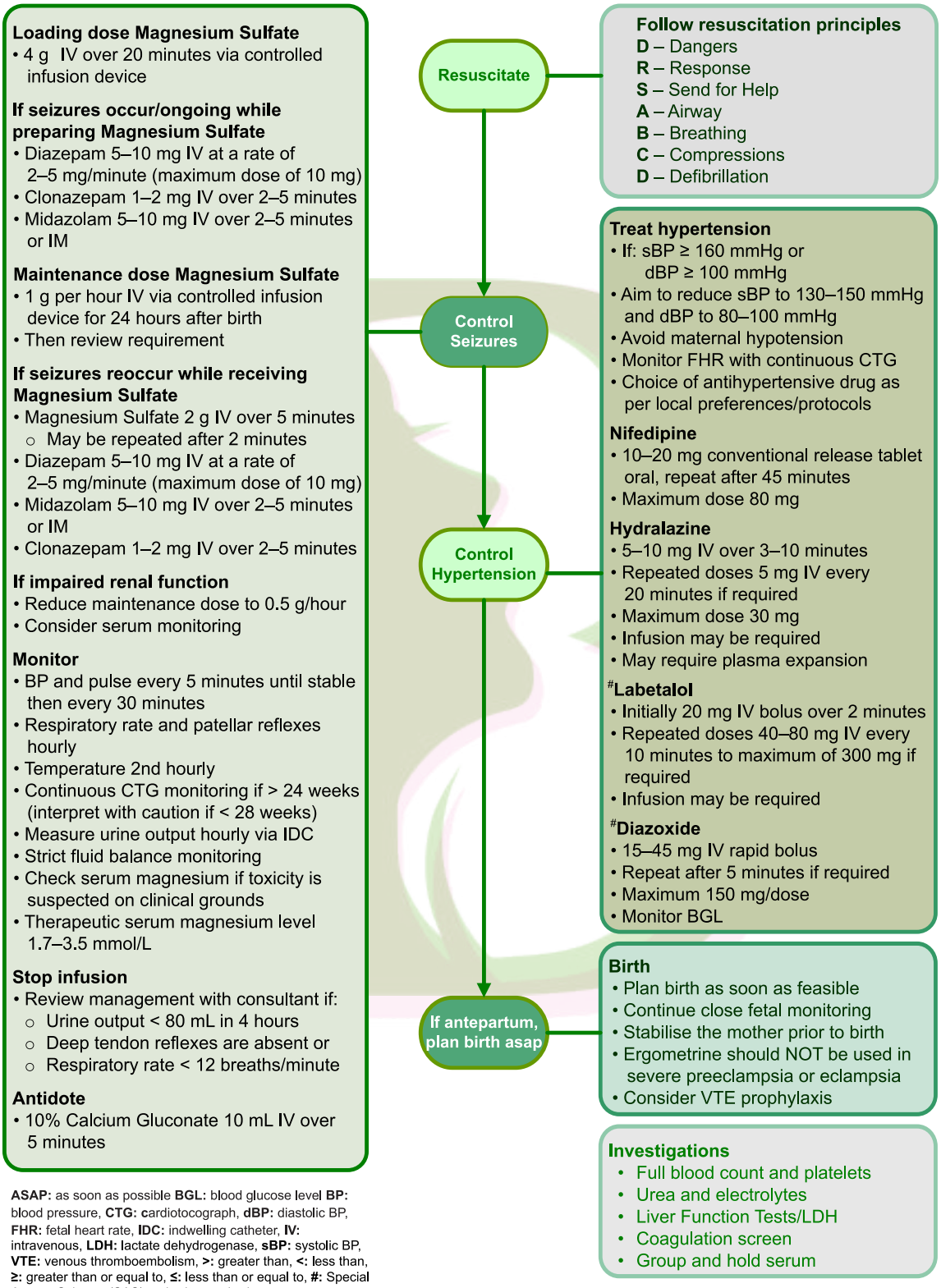
- Or Nifedipine 5 mg chewed and swallowed or injected into the oropharynx; may be repeated at 10-minute intervals
- Or Nicardipine 1–2 mg at one minute intervals until control is obtained, then 1–2 mg every hour

Rectal administration of drugs

1. Give diazepam rectally when IV access is not possible. The loading dose of 20 mg is taken in a 10 ml syringe.

2. Remove the needle, lubricate the barrel and insert the syringe into the rectum to half its length. Discharge the contents and leave the syringe in place, holding the buttocks together for 10 minutes to prevent expulsion of the drug. Alternatively, instill the drug in the rectum through a urinary catheter. If convulsions are not controlled within 10 minutes, inject an additional 10 mg per hour or more, depending on the size of the woman and her clinical response.

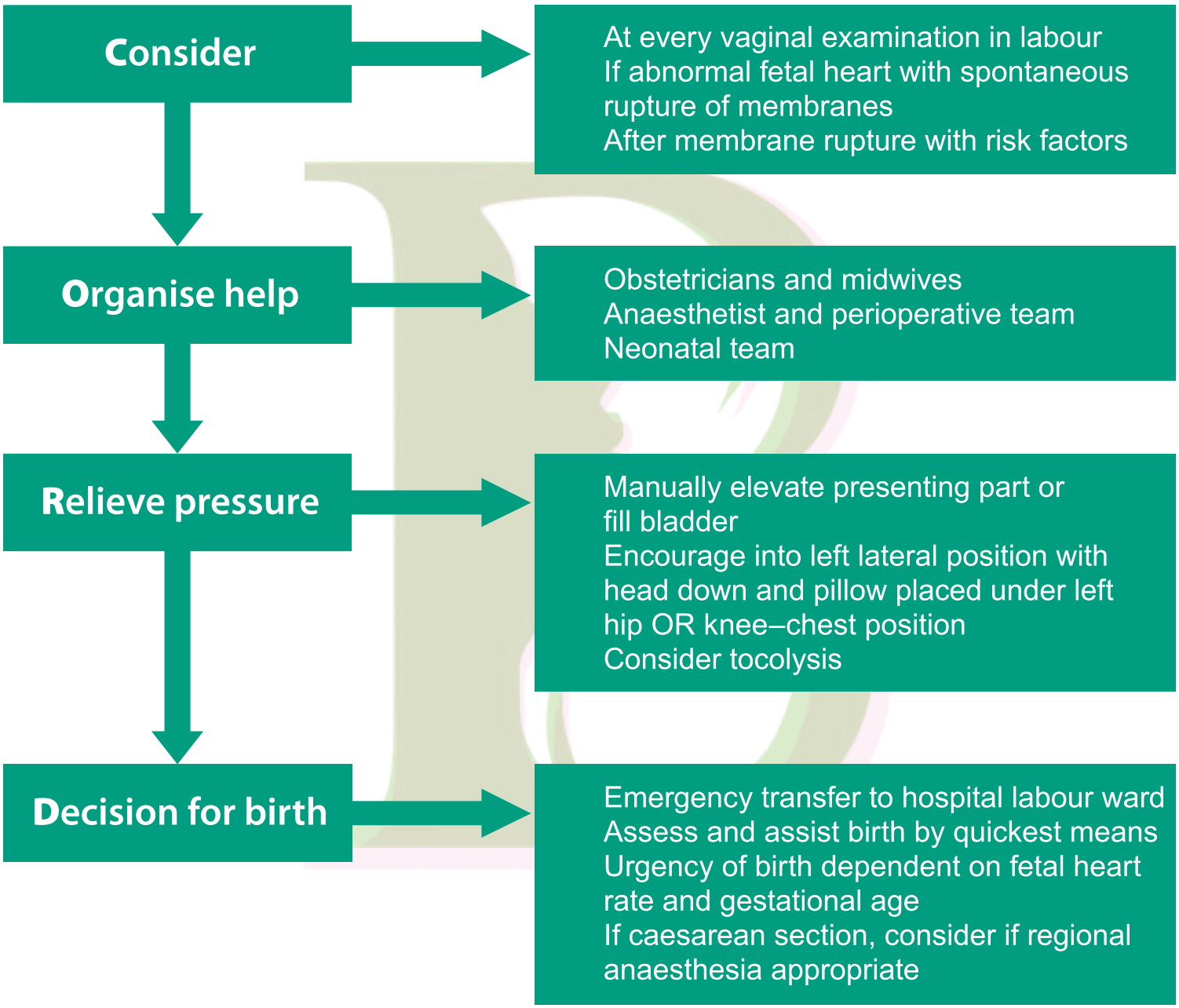
Management of eclampsia

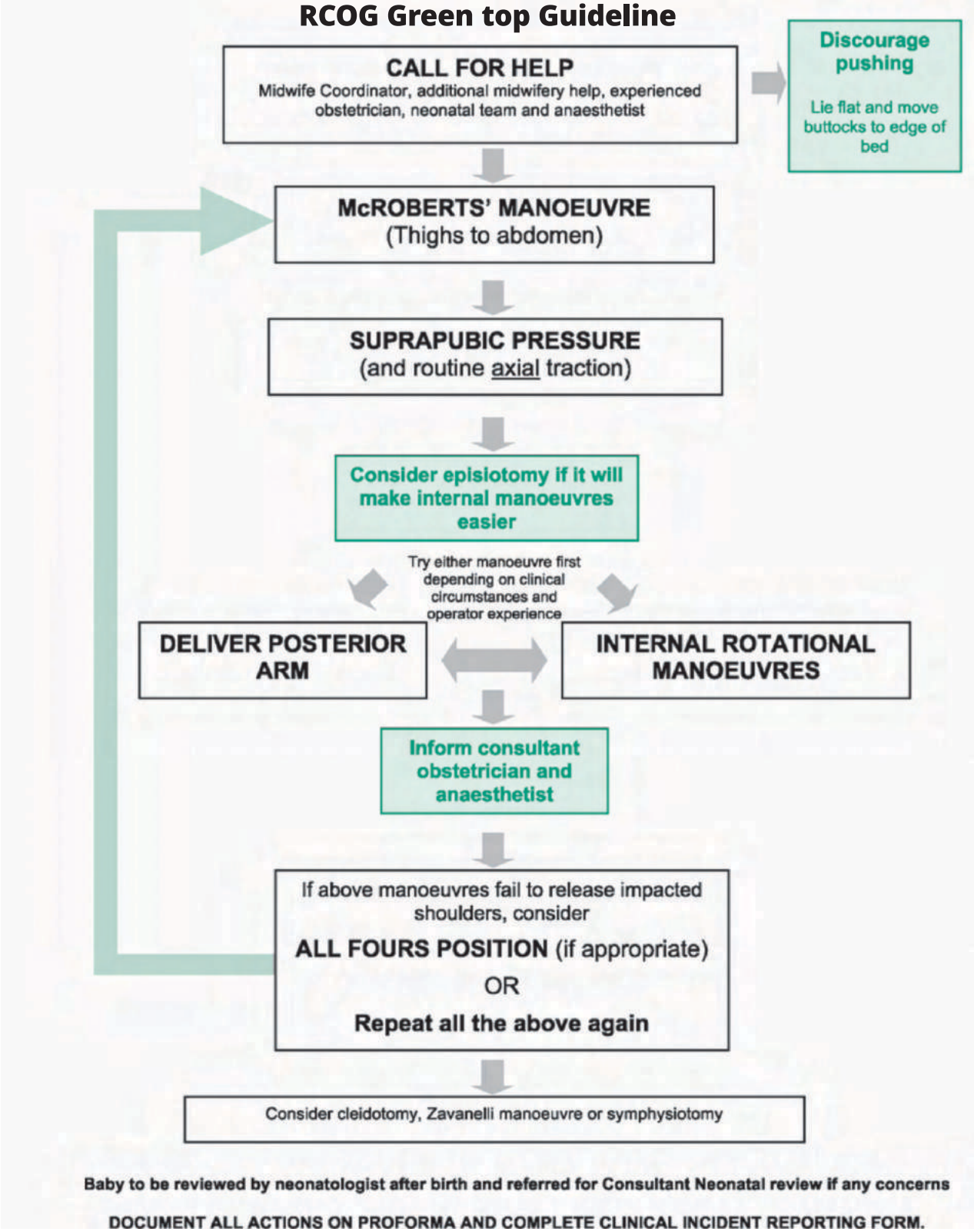


ASAP: as soon as possible **BGL:** blood glucose level **BP:** blood pressure, **CTG:** cardiotocograph, **dBP:** diastolic BP, **FHR:** fetal heart rate, **IDC:** indwelling catheter, **IV:** intravenous, **LDH:** lactate dehydrogenase, **sBP:** systolic BP, **VTE:** venous thromboembolism, **>:** greater than, **<:** less than, **≥:** greater than or equal to, **≤:** less than or equal to, **#:** Special Access Scheme (SAS) authority required

Adapted from: Algorithm 16.1 Preeclampsia/eclampsia *in* The Moet course manual: managing obstetric emergencies and trauma (2007) Queensland Clinical Guidelines: Hypertensive disorders in pregnancy. Flowchart version: F15.13-1-V7-R20

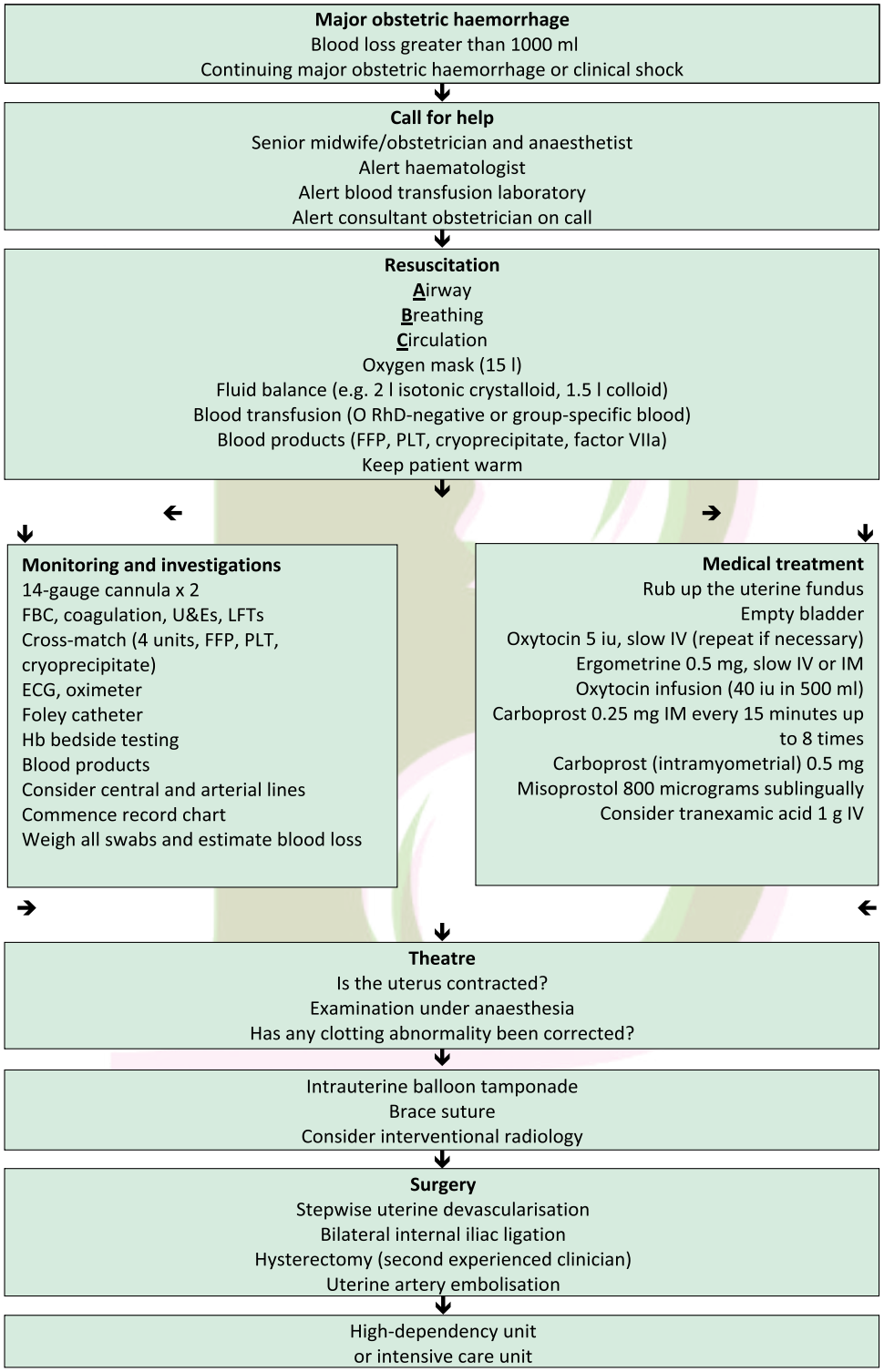
RCOG Green top Guideline




RCOG Green top Guideline
CALL FOR HELP
Midwife Coordinator, additional midwifery help, experienced obstetrician, neonatal team and anaesthetist
Discourage pushing
Lie flat and move buttocks to edge of bed
McROBERTS' MANOEUVRE
(Thighs to abdomen)
SUPRAPUBIC PRESSURE
(and routine axial traction)
Consider episiotomy if it will make internal manoeuvres easier
Try either manoeuvre first depending on clinical circumstances and operator experience
DELIVER POSTERIOR ARM
INTERNAL ROTATIONAL MANOEUVRES
Inform consultant obstetrician and anaesthetist
If above manoeuvres fail to release impacted shoulders, consider
ALL FOURS POSITION (if appropriate)
OR
Repeat all the above again
Consider cleidotomy, Zavanelli manoeuvre or symphysiotomy
Baby to be reviewed by neonatologist after birth and referred for Consultant Neonatal review if any concerns
DOCUMENT ALL ACTIONS ON PROFORMA AND COMPLETE CLINICAL INCIDENT REPORTING FORM.

RCOG Green top Guideline

Resuscitation, Monitoring, Investigation & Treatment should occur simultaneously

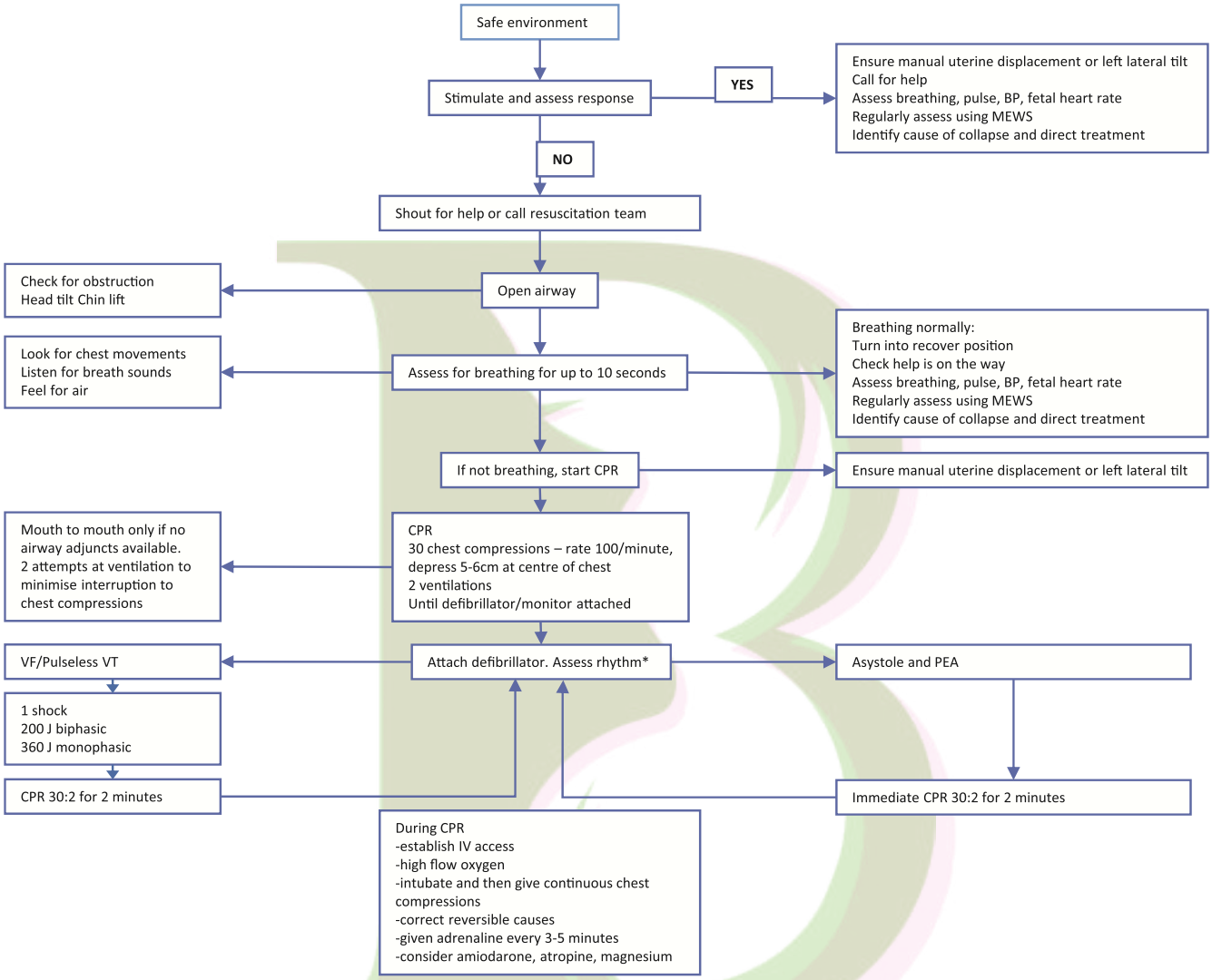


Abbreviations: ECG electrocardiogram; **FBC** full blood count; **FFP** fresh frozen plasma; **Hb** haemoglobin; **IV** intravenous; **IM** intramuscular; **LFTs** liver function tests; **PLT** platelets; **PPH** postpartum haemorrhage; **RhD** rhesus D; **U&Es** urea and electrolytes.

FLUID THERAPY & BLOOD PRODUCT TRANSFUSION

Crystalloid	Up to 2 l isotonic crystalloid.
Colloid	Up to 1.5 l colloid until blood arrives.
Blood	If immediate transfusion is indicated, give emergency group O, rhesus D (RhD)-negative, K-negative red cell units. Switch to group-specific red cells as soon as feasible.
Fresh frozen plasma (FFP)	Administration of FFP should be guided by haemostatic testing and whether haemorrhage is continuing: • If prothrombin time (PT) or activated partial thromboplastin time (APTT) are prolonged and haemorrhage is ongoing, administer 12–15 ml/kg of FFP. • If haemorrhage continues after 4 units of red blood cells (RBCs) and haemostatic tests are unavailable, administer 4 units of FFP.
Platelet concentrates	Administer 1 pool of platelets if haemorrhage is ongoing and platelet count less than 75×10^9/l.
Cryoprecipitate	Administer 2 pools of cryoprecipitate if haemorrhage is ongoing and fibrinogen less than 2 g/l.

RCOG Green top Guideline



Correct reversible causes (THE)		
4 Ts Thromboembolism (pulmonary and amniotic fluid Toxic and therapeutic (local anaesthetic) Cardiac tamponade Tension pneumothorax	4 Hs Hypoxia Hypovolaemia Hyper/hypokalaemia (metabolic) Hypothermia	E Eclampsia

***Could be with automated external defibrillator**
Manual uterine displacement (or left lateral tilt)
Empty the uterus if approx. 20 weeks onwards. Aim for uterine evacuation within 5 minutes

WHO Manual 2007

RECORD KEEPING

- **Admission note**
  - Patient identity
  - Procedure to be performed
  - Persons involved
  - Complications expected.
- **Delivery book**
- **The operative note**
- **Postoperative notes** can be organized in the "SOAP" format:
  - Subjective - How the patient feels
  - Objective Findings - on physical examination, vital signs and laboratory results
  - Assessment -What the practitioner thinks
  - Plan Management – directives written in specific location as "orders".
- **Discharge note:** record
  - Admitting diagnosis and definitive diagnosis
  - Summary of patient's course in hospital
  - Instructions about further management as an outpatient, including any medication and the length of administration and planned follow-up.

Prevention of Transmission of HIV

- **Take care of your patients, your co-workers and yourself:**
  - Do not recap needles
  - Set up sharp's containers in the places where you use sharps - the further you have to move to dispose of a sharp the greater the chance of an accident
  - Do not use the same injection set on more than one patient
  - Dispose of your own sharps
  - Pass needles, scalpels and scissors with care and consideration.

- **Several points of aseptic routine applicable to members of the surgical team are also particularly relevant to the prevention of transmission of HIV:**
  - Protect areas of broken skin and open wounds with watertight dressings
  - Wear gloves during exposure to blood or body fluids and wash your hands with soap and water afterwards
  - Wash immediately with soap and water in case of skin exposure or contamination, whether from a splash, glove puncture or non-gloved contact
  - Wear protective glasses where blood splashes may occur, such as during major surgery; wash out your eyes with water as soon as possible if they are splashed
  - Wear a protective gown or apron if splash potential exists.
  - Clean blood spills immediately and safely.

Hand washing is the single most important measure for prevention of infection

Hand washing, the use of barrier protection such as gloves and aprons, the safe handling and disposal of "sharps" and medical waste and proper disinfection, cleaning and sterilization are all a part of creating a safe hospital.

Key Points

1. A safe injection does not harm the recipient, does not expose the provider to any avoidable risk and does not result in any waste that is dangerous for other people
2. Use a sterile syringe and needle for each injection and to reconstitute each unit of medication
3. Ideally, use new, quality controlled disposable syringes and needles
4. If single-use syringes and needles are unavailable, use equipment designed for steam sterilization
5. Prepare each injection in a clean, designated area where blood or body fluid contamination is unlikely
6. Use single-dose vials rather than multi-dose vials
7. If multi-dose vials must be used, always pierce the septum with a sterile needle; avoid leaving a needle in place in the stopper of the vial. Once opened, store multi-dose vials in a refrigerator.

Airway Management

First priority is establishment or maintenance of airway patency.

1. Talk to the patient

A patient who can speak clearly must have a clear airway. Airway obstruction by the tongue in the unconscious patient is often a problem. The unconscious patient may require assistance with airway and/or ventilation. If you suspect a head, neck or chest injury, protect the cervical spine during endotracheal intubation.

2. Give oxygen

Give oxygen, if available, via self-inflating bag or mask.

3. Assess the airway- Signs of airway obstruction include:

- Snoring or gurgling
- Stridor or abnormal breath sounds
- Agitation (hypoxia)
- Using the accessory muscles of ventilation/paradoxical chest movements
- Cyanosis.

Be alert for foreign bodies. Intravenous sedation is absolutely contraindicated in this situation.

4. Consider the need for advanced airway management

5. Indications for advanced airway management techniques include:

- Persisting airway obstruction
- Penetrating neck trauma with haematoma (expanding)
- Apnoea
- Hypoxia
- Severe head injury
- Chest trauma
- Maxillofacial injury.

Airway obstruction requires urgent treatment.

Transportation of critically ill patients

- Transporting patients is risky. It requires good communication, planning and appropriate staffing.
- Any patient who requires transportation must be effectively stabilized before departure.
- As a general principle, patients should be transported only if they are going to a facility that can provide a higher level of care.
- Planning and preparation include consideration of:
  - Type of transport (car, lorry, boat, etc.)
  - Personnel to accompany the patient
  - Equipment and supplies required en route for routine and emergency treatment
  - Potential complications
  - Monitoring and final packaging of the patient.
- Effective communication is essential with:
  - The receiving centre
  - The transport service
  - Escorting personnel
  - The patient and relatives.
- Effective stabilization necessitates:
  - Prompt initial resuscitation
  - Control of hemorrhage and maintenance of the circulation
  - Immobilization of fractures
  - Analgesia.
- Remember, if the patient deteriorates
  - Re-evaluate the patient by using the primary survey
  - Check and treat life threatening conditions
  - Make a careful assessment focusing on the affected system.

Be prepared: if anything can go wrong, it will – and at the worst possible time!

Protocol for Treatment of Anaphylaxis

- Diagnose the presence or likely presence of anaphylaxis.
- Place patient in recumbent position and elevate lower extremities.
- Monitor vital signs frequently (every two to five minutes) and stay with the patient.
- Administer epinephrine 1:1,000 (weight-based) (adults: 0.01 mL per kg, up to a maximum of 0.2 to 0.5 mL every 10 to 15 minutes as needed; children: 0.01 mL per kg, up to a maximum dose of 0.2 to 0.5 mL) by SC or IM route and, if necessary, repeat every 15 minutes, up to two doses).
- Administer oxygen, usually 8 to 10 L per minute; lower concentrations may be appropriate for patients with chronic obstructive pulmonary disease.
- Maintain airway with an oropharyngeal airway device.
- Administer the antihistamine diphenhydramine (Benadryl, adults: 25 to 50 mg; children: 1 to 2 mg per kg), usually given parenterally.
- If anaphylaxis is caused by an injection, administer aqueous epinephrine, 0.15 to 0.3 mL, into injection.