DELIVERY AFTER PREVIOUS CAESAREAN BIRTH

1. Aim

To provide evidence-based information on the management of women undergoing either trial of vaginal birth after previous caesarean section (trial of VBAC) or elective repeat caesarean section (ERCS). This guideline is primarily aimed at the management of women with an uncomplicated term singleton pregnancy with a history of single previous lower segment caesarean section.

2. Introduction and background

After having had a previous section, women may opt for either trial of VBAC or ERCS. There is widespread public and professional concern about the rising rates of caesarean section [1], which has contributed to an increased obstetric population with a history of prior caesarean and increased rates of repeat caesarean delivery [2-5]. Trial of VBAC has been advocated as a safe method to reduce the number of caesarean sections performed. In the RCOG's National Sentinel Caesarean Section Audit (NSCCA) of 2000 [6], 50% of women with a previous caesarean section attempted VBAC, and the success rate was 64%.

Recent observational studies have shown that maternal and perinatal morbidity and perinatal mortality are higher in women undergoing trial of VBAC compared to ERCS. These factors, along with medico-legal fears, have led to a recent decline in clinicians offering, and women accepting, trial of VBAC delivery [2-5] This guideline presents the best available evidence to facilitate antenatal counselling in women with prior caesarean delivery and intrapartum management of women undergoing trial of VBAC.

3. Identification and assessment of evidence

Electronic searches were performed in MEDLINE (Ovid version 1996-January 2006), EMBASE (Ovid version 1996-January 2006) using relevant medical subject headings and text words. Evidence based reviews and guidance from ACOG[7;8], SOGC [9] , ARHQ USA [10], and The Cochrane Library (2006) [11] were identified and used in the development of this guideline. The definitions of the types of evidence used in this guideline originate from the US Agency for Health Care Research and Quality. Where possible, recommendations are based on and explicitly linked to the evidence that supports them. Areas lacking evidence are highlighted and annotated as 'good practice points'.

4. Definition of terms used in this guideline

Trial of VBAC: Trial of VBAC (vaginal birth after caesarean) refers to any woman who has experienced a prior caesarean birth who plans to deliver vaginally rather than by elective repeat caesarean section (ERCS).

Successful and unsuccessful trial of VBAC: A spontaneous or assisted vaginal delivery in a woman undergoing trial of VBAC indicates a successful trial. Delivery by emergency caesarean section during such an attempt indicates an unsuccessful trial of VBAC.

Uterine rupture : defined as disruption of the full thickness of the uterine muscle that breaches the uterine serosa. Uterine dehiscence is defined as disruption of the uterine muscle with intact serosa.

Term Perinatal mortality: combined number of stillbirths (antepartum and intrapartum) and neonatal deaths (death of a live born infant from birth to age 28 days) per 10,000 live births and stillbirths, excluding deaths due to fetal malformation.

Term Delivery-related perinatal death: combined number of intrapartum stillbirths and neonatal deaths per 10,000 stillbirths and live births, excluding deaths due to fetal malformation.

Neonatal respiratory morbidity: combined rate of transient tachypnoea of the newborn (TTN) and respiratory distress syndrome (RDS).

5. Limitations of data used in guideline

There are no RCTs comparing planned trial of VBAC against planned ERCS [11]. Evidence for these interventions is obtained mainly from retrospective non-randomised studies. Furthermore, many of the main outcomes of interest are relatively uncommon. Adequately powered studies require large numbers and these frequently rely on routinely collected data. Consequently, many studies have limitations in terms of definition of exposures and outcomes, ascertainment bias and selection bias. Furthermore, the consequent inter-study heterogeneity undermines reliable meta-analyses[12;13]. A recently published study by the National Institute of Child Health and Human Development (NICHD) Maternal–Fetal Medicine Units Network[14] has overcome many of these shortcomings by having a large sample size, a prospective cohort design and utilising standardised definitions for assessing outcomes. A major issue in the interpretation of that report is, however, that the groups being delivered by ERCS included all women, including those in whom vaginal delivery was relatively or absolutely contraindicated. While this study provides useful estimates of the absolute risk of adverse events related to attempted VBAC, the risk of adverse outcome among the ERCS group may be an over-estimate of the risk for women who are eligible for VBAC.

6. Suitability for trial of VBAC

Any woman with a prior history of one uncomplicated low transverse caesarean section, in an otherwise uncomplicated pregnancy at term, with no contraindication for vaginal delivery, may be offered a trial of VBAC.

There is insufficient evidence on whether maternal or neonatal outcomes are significantly influenced by the number of prior caesarean deliveries or type of prior uterine scar [14-18].

Nonetheless, due to high absolute risks of uterine rupture, trial of VBAC is absolutely contraindicated in women with:-

- Previous uterine rupture
- Previous classical caesarean section
- More than two previous caesarean deliveries

A number of other variants are associated with an increased risk of uterine rupture. These include: women with prior inverted T or J incision (1.9% rupture risk)[14], women with prior low vertical incision (2% rupture risk)[14] and women with two previous low transverse caesarean deliveries (1.7%-3.7% rupture risk; 62%-75% VBAC success rate [16;19;20]). Women who wish to attempt VBAC despite previous complex uterine incisions or more than one previous caesarean section should be counselled by a consultant and risk analysis made of the indication for - and the nature of - the previous surgery.

7. Antenatal counselling

The antenatal counselling of women eligible for VBAC should be documented in the notes and supplemented with administration of a patient information leaflet.

Any woman who has experienced a prior caesarean birth should be counselled about the maternal and perinatal risks and benefits of trial of VBAC and ERCS when deciding the mode of delivery. The key issues to include in the discussion are listed below. The risks and benefits should be discussed in the context of the woman's individual circumstances, including her personal motivation to achieve vaginal birth, her attitudes towards the risk of rare but serious adverse outcomes, her plans for future pregnancies and her chance of a successful attempt (principally whether she has previously had a vaginal birth - see below).

Women considering trial of VBAC should be counselled that there is a high chance of success in most cases (success rates of 72%-76%)

Individual studies report success rates of 72%-76% [14;21;22] for trial of VBAC, which concurs with pooled rates derived by systematic and summative reviews [12;23;24]. Maternal adverse events (uterine rupture, hysterectomy, transfusion and endometritis) are more common in women with failed VBAC compared with both successful VBAC and ERCS [14;22].

A number of factors are associated with successful trial of VBAC. Previous vaginal delivery, particularly previous VBAC, is the best single predictor of a successful trial of VBAC and is associated with an approximately 90% success rate [25-27]. The likelihood of success is lowered if labour is induced, BMI>30 and previous caesarean indication was for dystocia [25]. When all these factors are present, VBAC is achieved in only 40% of cases [25]. Trial of VBAC after 40 weeks gestation, advanced maternal age, short stature and a male infant are also independently associated with a decreased likelihood of VBAC success [26;28;29].

Several pre-admission and admission based multivariate models have been developed to predict the likelihood of VBAC success [26;30-33]. However, their usefulness in clinical practice remains to be determined.

Women considering trial of VBAC should be counselled that the absolute risk of uterine rupture is extremely low (74 per 10,000).

Uterine rupture in an unscarred uterus is extremely rare at 2 per 10,000 deliveries, and this risk is mainly confined to multiparous women in labour [34]. The NICHD study reported the overall risk for symptomatic uterine rupture at term was 74 per 10,000 trials of VBAC [14]. There was zero risk in women undergoing ERCS [14]. Studies with differing methodological designs and definitions of scar rupture report similar estimates for risk of uterine rupture in trial of VBAC: systematic and non-systematic reviews of 39 [24], 43 [13] and 62 [23] per 10,000; retrospective studies of 35 [35] and 65 [22] per 10,000. Although a rare outcome, uterine rupture is associated with significant maternal and perinatal morbidity and perinatal mortality (see below).

Women considering trial of VBAC should be counselled that there is probably a small increased risk of blood transfusion and endometritis compared to ERCS, and that the absolute risks of serious adverse effects (e.g. hysterectomy, thromboembolic disease or maternal mortality) are extremely low.

Although absolute risks remain small, women attempting trial of VBAC compared to ERCS are at greater risk of blood transfusion requirement (1.7% vs.1.0%) and endometritis (2.9% vs. 1.8%)[14]. There was no significant difference between trial of VBAC and ERCS groups in relation to hysterectomy (23 per 10,000 vs. 30 per 10,000), thromboembolic disease (4 per 10,000 vs. 6 per 10,000) or maternal death (17/100,000 vs. 44/100,000)[14]. However, this comparison is undermined by the fact that the group delivered by ERCS in that study included women in whom an attempt at VBAC was absolutely or relatively contraindicated, e.g. due to placenta praevia, high numbers of previous caesarean deliveries or maternal disease. The presence of these conditions may have led to an over-estimate of the risk of adverse outcomes associated with ERCS. Nonetheless, the study clearly indicates that the absolute risks of severe maternal adverse effects of attempting VBAC are extremely small. Maternal death related to uterine rupture in trial of VBAC is exceedingly rare in the developed world and is confined to case reports [22;36].

Women considering trial of VBAC should be counselled that this decision probably carries a very small additional risk of perinatal death compared with ERCS but that the risk of such a loss is comparable to the risk for women having their first birth.

In the NICHD study[14], perinatal mortality at term was significantly greater among women attempting VBAC than women delivered by ERCS. Overall perinatal mortalities for trial of VBAC vs. ERCS respectively were 32 per 10,000 vs. 13 per 10,000 (RR 2.40, 95% CI 1.43 to 4.01) and perinatal mortalities after excluding fetal malformation were 24 per 10,000 vs. 9.3 per 10,000 (RR 2.52, 95% CI 1.37-4.62). Approximately 70% of the perinatal deaths in attempted VBAC were due to antepartum stillbirth. Approximately 40% of these stillbirths had no congenital abnormality and occurred at or after 39 weeks gestation and may, therefore, have been prevented by performing ERCS at 39 weeks. The absolute risk of antepartum stillbirth at or after 39 weeks among women with one prior caesarean section is approximately 10 per 10,000 [14;37].

In the NICHD study, rates of delivery-related perinatal death were very low: 4 per 10,000 for women attempting VBAC and 1.4 per 10,000 for ERCS [14]. A report of data for the whole of Scotland demonstrated higher overall rates of delivery-related perinatal death associated with attempted VBAC of 12.9 per 10,000 whereas the risk of death associated with ERCS was

comparable to the US study at 1.1 per 10,000 [21]. The reason for the higher rate of delivery-related deaths among women attempting VBAC in Scotland may reflect the fact that these were population-based data whereas the US data were exclusively from tertiary centres. Consistent with this interpretation, a further study of data from Scotland demonstrated a lower risk of perinatal death due to uterine rupture in larger centres [35].

Accepting the limitations of using these observational data, a reasonable summary is that attempting VBAC carries an approximately 10 per 10,000 additional risk of an antepartum stillbirth and, if the attempt is conducted in a large centre, an approximately 4 per 10,000 risk of delivery-related perinatal death. Women should be counselled that it is possible that these risks may be reduced by ERCS but direct evidence of this is lacking. It may be helpful to emphasise to women that the absolute risks of both antepartum stillbirth and delivery-related perinatal death among women attempting VBAC are comparable to the risks for nulliparous women [21;38].

Women considering trial of VBAC should be counselled that this decision probably carries a very small additional risk of the infant developing hypoxic ischaemic encephalopathy. The effect of the decision on the long term outcome for the infant is unknown.

The incidence of intrapartum hypoxic ischaemic encephalopathy (HIE) at term is significantly greater in trial of VBAC (7.8 per 10,000) compared to ERCS (zero rate)[14]. Approximately half of the increased risk in trial of VBAC arises due to the additional risk of HIE caused by uterine rupture (4.6 per 10,000)[14]. The definition used and distribution of severity of HIE is not stated in the NICHD study [14]. Severe neonatal metabolic acidosis (pH<7.00) occurred in 33% of term uterine ruptures [14]. There is no information comparing long term outcome, such as cerebral palsy, among women attempting VBAC and those delivered by ERCS. Given that cerebral palsy following term birth is very rare (approximately 10 per 10,000) and that most cases are thought to be unrelated to mode of delivery, appropriate analysis of this question would require a scale involving hundreds of thousands of women. No adequate study has currently been reported.

Women considering trial of VBAC should be counselled that an attempt at vaginal birth probably reduces the risk that the infant will develop respiratory problems in the neonatal period.

Three observational studies, pooling data from around 90,000 deliveries, have shown an increased risk of neonatal respiratory morbidity in term infants delivered by elective caesarean (3.5%-3.7%) compared to vaginal delivery (0.53%-1.4%) [39-41]. The NICHD study [14] (n=30,352 deliveries) reported a similar trend in women with prior caesarean section, where the incidence of TTN in ERCS vs. trial of VBAC was 3.6% vs. 2.6% (RR 1.40, 95% CI 1.23-1.59; NNT -98). These rates concur with rates of TTN derived from a smaller data set that examined women with prior caesarean section (2 studies, n=4,478 deliveries) of 2.4%-6% vs. 1.3%-3% [41;42] for ERCS vs. trial of VBAC respectively. The NICHD study did not report rates of RDS, however the smaller data set reported RDS as 0.4%-0.6% vs. 0%-0.05% for ERCS vs. trial of VBAC respectively [41;42].

Women considering trial of VBAC should be counselled that the additional risk of respiratory problems in the neonatal period associated with ERCS can be reduced – but not eliminated - by delaying the procedure until 39 weeks.

Evidence from observational studies [39-41] and a recently published trial [43] has shown a beneficial effect on reducing respiratory morbidity by delaying elective caesarean section to at least 39 weeks. The trial reported respiratory morbidity was11.4%, 6.2% and 1.5% at 37, 38 and 39 weeks gestation respectively [43]. Furthermore, the trial [43] demonstrated an approximate 50% reduction in respiratory morbidity (for both TTN and RDS components) by administering prophylactic betamethasone to elective caesarean deliveries beyond 37 weeks (steroid vs control; 2.4% vs 5.1%; RR 0.46, 95% CI 0.23-0.93), and this treatment effect was still apparent at 39 weeks (steroid vs control; 0.6% vs 1.5%). The routine use of prophylactic betamethasone in ERCS is beyond the scope of this guideline.

Women considering mode of delivery who are eligible for VBAC should be counselled that the risk of severe anaesthetic complications is very low irrespective of the chosen mode of delivery.

Anaesthetic procedure-related complications are extremely rare. Of the women undergoing caesarean section (emergency and elective) in the NICHD study (n=37,142), 93% received a regional anaesthetic and only 3% of regional procedures failed. There was one maternal death (2.7 per 100,000) attributed to an anaesthetic problem (failed intubation) [44].

Women considering trial of VBAC should be counselled that the decision to have an ERCS may increase the risk of serious complications in future pregnancies

Overall, placenta praevia occurs in 5 per 1000 deliveries [45] and placenta accreta between 0.25-2 per 1000 deliveries. All women with one caesarean section have an increased risk of placenta praevia (RR 4.5, 95% CI 3.6-5.5) and placenta accreta (complicating 10-24% of praevias) relative to women with an unscarred uterus[46]. However, repeat caesarean deliveries will increase the relative risk of placenta praevia, placenta accreta and consequent hysterectomy in subsequent pregnancies, as the relationship between number of prior caesareans and these outcomes is approximately linear [46-49]. Major maternal morbidity (hysterectomy, haemorrhage, viscus injury, dense adhesions) rises with each successive caesarean section, and is particularly associated with the presence of placental praevia or placenta accreta [48;50;51]. A retrospective study of approximately 3000 women from Saudi Arabia showed a linear increase in the risk of bladder injury (0.3%, 0.8%, 2.4%), hysterectomy (0.1%, 0.7%, 1.2%) and transfusion requirement (7.2%, 7.9%, 14.1%) with a history of two, three and five caesarean sections respectively [48].

Women considering trial of VBAC should be counselled that there is only limited evidence on the safety and efficacy of trial of VBAC in twin gestation, fetal macrosomia and short inter-delivery interval.

Study sample sizes are underpowered to provide reliable evidence suitable for any clinical practice recommendation in relation to twin gestation, fetal macrosomia and short inter-delivery interval.

- **Twin Gestation**

The US Cohort study [52] (n=186 twins), US retrospective study[53] (n=535 twins) and a review [17] (7 studies, n=233 twins) have reported similar successful rates of VBAC in twin pregnancies to that in singleton pregnancies (65%-84%). Women who attempted a trial of VBAC with twins had no increased risk of major maternal morbidity or uterine rupture compared to trials of VBAC in singleton gestations [52;53].

- **Fetal Macrosomia**

A review [17] of four retrospective studies has reported a significantly decreased likelihood of successful trial of VBAC for pregnancies with infants weighing 4000g or more (55-67%) compared to smaller infants (77-83%). There is no increased risk of uterine rupture, except in the subgroup of women without a prior vaginal delivery [54]. However, in reality, birth weight is unknown, the evidence is not robust, and it is difficult to incorporate suspected birth weight data into antenatal counselling.

- **Short inter-delivery interval**

Three observational studies of limited size [55-57] have shown a two-to-three fold increased risk of uterine scar rupture for women with a short inter-delivery interval (below 15-24 months) from their previous caesarean section.

8. Conduct of an attempt at VBAC

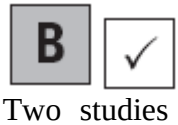
Trial of VBAC should be conducted in a suitably staffed and equipped delivery suite with resources for immediate caesarean section and neonatal resuscitation

Obstetric, midwifery, anaesthetic, operating theatre and haematological support should be available throughout trial of VBAC and ERCS. A retrospective study of Canadian data showed that the relative risk of uterine rupture when comparing trial of VBAC with ERCS increased two fold in low-volume obstetric units (<500 births per year) than high-volume (>500 births per year) units, even though lower volume units had lower-risk obstetric population [22]. A retrospective study on Scottish data showed that trial of VBAC in low-volume hospitals (<3000 births/year) was not associated with an increased risk of uterine rupture overall but was associated with an increased risk of uterine rupture that led to perinatal death [35]. It is likely that the availability of resources for immediate delivery and neonatal resuscitation may reduce the risk of uterine rupture to the infant.

Induction of labour is associated with increased risks of uterine rupture and caesarean section. Consequently, the decision, timing and method of induction of labour should be consultant-led and the induction process should occur on labour ward.

For all methods of induction, the absolute risk of uterine rupture was 101 per 10,000 (1%) in the NICHD study [14] and 82 per 10,000 (0.8%) in a Canadian data set [22]. This equated to around a two-fold higher risk of uterine rupture than women in spontaneous labour for each respective study.

Particular caution should be applied to women with an unfavourable cervix who require prostaglandin priming of the cervix.



Two studies have shown higher risks of uterine rupture with prostaglandin than non-prostaglandin based methods of induction [14;35]. In the NICHD study, prostaglandin based induction incurred a non-significantly higher uterine rupture risk than mechanical induction

methods (e.g. insertion of intracervical Foley catheter) (140 per 10,000 vs. 89 per 10,000) [14]. A retrospective analysis of approximately 36,000 women attempting VBAC in Scotland which included approximately 4,600 women having prostaglandin induction, showed that induction of labour with prostaglandin, but not other methods, was independently associated with an increased risk of uterine rupture leading to perinatal death (11 per 10,000 inductions) [35]. This risk was three-fold higher than the perinatal death rate due to uterine rupture in non-prostaglandin based inductions (4.5 per 10,000 inductions). This compares to 6 per 10,000 risk of perinatal death in women with an unscarred uterus induced by prostaglandin identified by a Cochrane review.[58] It is currently unclear whether the association between PGE2 and uterine rupture is a specific pharmacological effect of the drug or whether it is a marker of women with an unfavourable cervix[59]. Use of prostaglandin induction is associated with a likelihood ratio for caesarean section of 1.37 equating to an increased risk of emergency caesarean section from 25% to 35% [26]. Systematic reviews [60-62] have shown there is limited quality evidence on induction methods and their outcomes (4 RCTs, n=137), and only limited analysis of induction methods was performed by the NICHD study[14]. However, some women may be prepared to accept the additional risk associated with prostaglandin induction (e.g. those who are planning many future pregnancies) in view of the advantages of a successful VBAC.

Epidural anaesthesia is not contraindicated in an attempt at VBAC

Trial of VBAC success rates are similar in women who receive epidural analgesia to those that receive alternative methods of analgesia[63]. Furthermore, epidural analgesia does not significantly mask the signs and symptoms associated with uterine rupture [64]. A retrospective comparative study showed that within the trial of VBAC group, infants of mothers who received epidural analgesia were more likely to be subjected to diagnostic tests and therapeutic interventions (including sepsis evaluation and antibiotic treatment) compared to infants from a matched no-epidural analgesia group [65].

Women should be advised to have continuous electronic fetal monitoring following onset of uterine contractions for the duration of trial of VBAC.

An abnormal CTG is the most consistent finding in uterine rupture and is present in 55%-87% of these events[13]. Moreover, continuous electronic fetal monitoring is generally used among women attempting VBAC and thus the estimates of risk of both lethal and non-lethal perinatal asphyxia associated with VBAC are in this context. The relative and absolute risks of severe adverse events in the absence of continuous electronic fetal monitoring are unknown.

There is insufficient evidence to support the use of intrauterine pressure catheters in the early detection of uterine scar rupture

Observational studies have shown intrauterine pressure catheters are not always reliable [66] and do not add significant additional ability to predict uterine rupture over clinical and CTG surveillance [67-70]. Furthermore, intrauterine catheter insertion may be associated with risk [71].

Intrapartum care should be vigilant for the characteristic symptoms and signs suggesting uterine scar dehiscence or rupture.

Early diagnosis of uterine scar dehiscence or rupture followed by expeditious laparotomy and resuscitation is essential to reduce associated morbidity and mortality. There is no single pathognomic clinical feature indicating uterine rupture but the presence of any of the following peripartum is indicative of this event. The diagnosis is ultimately confirmed at emergency caesarean section or postpartum laparotomy.

1. Abnormal CTG
2. Severe abdominal pain, especially if persisting between contractions
3. Acute onset scar tenderness
4. Abnormal vaginal bleeding or haematuria
5. Abrupt cessation of uterine activity
6. Inefficient uterine activity
7. Maternal tachycardia, hypotension or shock
8. Loss of station of the presenting part

Women should be counselled regarding the 2-fold increased risk of uterine rupture and 1.5-fold increased risk of caesarean section in augmented compared to non-augmented labours. Therefore, the use of oxytocin augmentation should be a consultant-led decision.

Augmentation of labour among women with an unscarred uterus is associated with an extremely low risk of uterine rupture at 5 per 10,000 [34]. Among women attempting VBAC, the risk of uterine rupture in those with non-augmented labour was 36 per 10,000 and in those having labour augmented was 87 per 10,000[14]. A systematic review[61] of seven observational studies showed that oxytocin given to induce and/or augment labour increased the risk of caesarean section compared to non-augmented spontaneous labour by around 1.5 fold (32% [range 18-44] vs. 20% [range 11-35]). These additional risks in augmented trial of VBAC mean that:

1) Although augmentation is not contraindicated it should only be commenced after careful obstetric assessment, patient counselling and by a consultant-led decision.
2) Frequent serial cervical assessment is necessary to show adequate cervicometric progress and fetal head descent to permit the augmentation process to continue. Inefficient uterine activity in women with prior caesarean may be a sign that uterine rupture has occurred or is imminent. The administration of oxytocin in this situation, or where there is failure to progress despite adequate augmentation, may seriously compound a pre-existing problem.

There are no data on the maximum safe interval for vaginal examinations to assess progress in augmented labour in women with a previous caesarean. Therefore, at the time of the consultant decision to augment a labour with oxytocin, a clear plan for further cervical assessment should also be documented along with the criteria for discontinuing the attempt at vaginal birth.

9. Auditable standards

Standards for audit of practice could include the following:
Use of continuous electronic fetal monitoring during conduct of VBAC.

Standards for audit of documentation could include the following:

Documented discussion of risks and benefits of VBAC
Documentation of consultant involvement in decisions to induce labour or augment labour
Documentation of plan in the event of oxytocin augmentation of labour in VBAC

10. Future research

- Development, validation and pragmatic clinical evaluation of a scoring system to identify women at high or low risk of a failed VBAC that is antenatally and/or intrapartum based.
- The clinical effectiveness of differing induction and augmentation regimens, perhaps individualised according to clinical features rather than standard proscribed strategies
- Identify if there are differences in long-term maternal and infant outcomes between trial of VBAC and ERCS e.g. subfertility, depression, pelvic floor dysfunction, incontinence, psychosexual problems, respiratory illness, and neurodevelopmental disorders.
- Preference-based studies to identify which factors impact most on women accepting or declining trial of VBAC (e.g. patient information leaflet, previous childbirth experiences, desired family size, understanding the risk analysis during counselling)[72-78].
- Assess patient satisfaction[79;80], quality of life measures and health-state utilities in women following VBAC and ERCS to undertake robust economic modelling assessments.

11. Pending relevant trials

- ACTOBAC- A Collaborative Trial of Birth After Caesarean, No ISCRTN, Prof C Crowther, Adelaide, Australia. Colleagues have raised ethical and feasibility concerns with such a trial [81]
- The Twin Birth Study- a multicentre RCT comparing planned caesarean section with planned vaginal birth for twins at 32-38 weeks gestation, ISRCTN 74420086, Dr J Barrett, Toronto, Canada
- DiAMOND-Decision Aids for Mode Of Next Delivery, ISRCTN 84367722, Dr A Montgomery, Bristol, UK
- CAESAR-Caesarean Section Surgical Techniques , ISRCTN 11849611, Dr P Brocklehurst, National Perinatal Epidemiology Unit, Oxford, UK

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Classification of Evidence Levels

Ia Evidence obtained from meta-analysis of randomised controlled trials.
Ib Evidence obtained from at least one randomised controlled trial.
IIa Evidence obtained from at least one well-designed controlled study without randomisation.
IIb Evidence obtained from at least one other type of well-designed quasi-experimental study.
III Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.
IV Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities.

Grades of Recommendations

Requires at least one randomised controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation. (Evidence levels Ia, Ib)

Requires the availability of well controlled clinical studies but no randomised clinical trials on the topic of recommendations. (Evidence levels IIa, IIb, III)

Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates an absence of directly applicable clinical studies of good quality. (Evidence level IV)

Good Practice Point

Recommended best practice based on the clinical experience of the guideline development group

This Guideline was produced on behalf of the Guidelines and Audit Committee of the Royal College of Obstetricians and Gynaecologists by:
Professor G C S Smith MRCOG, Dr R Varma MRCOG, and Dr J K Gupta FRCOG,
and peer reviewed by:

The final version is the responsibility of the Guidelines and Audit Committee of the RCOG.

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