CRD summary
This review aimed to compare the benefits and harms of a trial of labour and elective repeat Caesarean delivery for women with prior Caesarean delivery. The authors’ conclusions, that deficiencies in the literature do not allow truly informed decisions to be made, appear to follow from the evidence presented. However, other relevant studies might have been missed.

Authors’ objectives
To compare the benefits and harms of a trial of labour (TOL) and an elective repeat Caesarean delivery (ERCD) for women with prior Caesarean delivery, and to examine factors that influence decision-making.

The review addressed 10 specific questions, of which five met the criteria for DARE:

1. What are the relative harms associated with a TOL (spontaneous onset, induced and augmented) and repeat Caesarean?

2. What is the incidence of uterine rupture, and are there methods for preventing major maternal and infant morbidity or mortality due to uterine rupture?

3. What are the health status and health-related quality of life for vaginal birth after Caesarean (VBAC) and repeat Caesarean patients?

4. Regarding VBAC and repeat Caesarean, what factors influence patient satisfaction or dissatisfaction with their childbirth experience?

5. How do legislation, policy, guidelines, provider characteristics, insurance type, and access to care affect health outcomes for VBAC candidates?

The questions that did not meet the criteria for DARE assessed epidemiology, economics and patient attitudes.

Searching
MEDLINE and HealthSTAR were searched from inception to 2002. The authors also checked the reference lists of systematic reviews and contacted experts involved in the review to identify relevant studies for all of the review questions. For specific questions, the authors searched the Cochrane Database of Systematic Reviews, the Cochrane CENTRAL Register, the Centre for Reviews and Dissemination's databases and EMBASE. The search terms were reported. Studies that began or were published prior to 1980 were excluded, as were those published in non-English languages or published only as abstracts.

Study selection
Study designs of evaluations included in the review
The authors did not state any inclusion criteria relating to the study design. However, they stated that editorials, letters and case reports with less than 10 participants were excluded. They also stated that case reports, case series and general population studies were identified, but as a rule were not included in the review. Studies that did not provide sufficient information to determine the methods for selecting participants and for analysing data were excluded.

Specific interventions included in the review
The authors did not state explicit inclusion criteria relating to the interventions. However, it was clear that studies of TOL and ERCD were eligible for inclusion. The authors stated that studies focusing exclusively on vertical, lower
vertical 'classical' or 'classic' Caesarean incisions or vaginal breech delivery were excluded.

Participants included in the review
Studies of women with prior Caesarean delivery that were conducted in developed countries were eligible for inclusion. Studies of the general birthing population were considered if there were no studies of patients with prior Caesarean. Studies of patients with specific conditions (e.g. gestational diabetes, human immunodeficiency virus and pre-eclampsia) were excluded, as were studies that focused exclusively on nulliparous women, pre-term delivery, multiple gestation or low birth weight. The authors did not report consistently the characteristics of the participants in the included studies.

Outcomes assessed in the review
The primary outcomes of interest were risks of major maternal and infant morbidity, and mortality associated with TOL and ERCD. Various outcomes were assessed (details given in the report).

How were decisions on the relevance of primary studies made?
Two reviewers assessed a random set of titles and abstracts for each topic area to select full papers, and then one reviewer assessed the rest of the titles and abstracts. In cases of disagreement, the lead reviewer for the topic area re-examined the abstract. The authors did not state how many reviewers assessed the full papers for relevance.

Assessment of study quality
Randomised controlled trials (RCTs) and cohort studies were assessed as good, fair or poor quality based on the following criteria: groups comparable at baseline and maintained throughout the study with follow-up of at least 80%; reliable and valid measurement instruments used and applied equally to the groups; interventions adequately described; important outcomes considered; appropriate attention given to confounders in analysis; intention-to-treat analysis used in RCTs.

Case-control studies were assessed as good, fair or poor quality based on the following criteria: appropriate ascertainment of cases and non-biased selection of case and control participants; exclusion criteria applied equally to cases and controls; accurate diagnostic procedures and measurements applied equally to cases and controls; appropriate attention to confounding variables.

For studies assessing patient satisfaction and health status, particular emphasis was placed on whether outcome measures were clearly described and validated and whether patient satisfaction and preferences were assessed from the point of view of the patient or the provider.

The authors did not state how the papers were assessed for quality, or how many reviewers performed the quality assessment.

Data extraction
The lead reviewer for each topic area extracted the data. In cases when the lead reviewer encountered difficulties in interpreting the data, a second reviewer assessed the article and a consensus was reached. Absolute risk differences and 95% confidence intervals (CIs) were calculated for each study.

Methods of synthesis
How were the studies combined?
Data from non-comparative studies were pooled using a Bayesian data analytic framework. Absolute risk differences were calculated for each study and pooled using both random-effects and fixed-effect models. Results were reported for the random-effects model, unless the results between the two methods were significantly different. Data from comparative studies were pooled using the random-effects model of DerSimonian and Laird. Where statistical pooling was not appropriate, the studies were combined in a narrative. Only studies of fair or good quality were synthesised.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the Q statistic. Pooling was not undertaken if statistically significant
heterogeneity was found.

**Results of the review**

For question 1, the authors stated that they examined 10 fair- or good-quality observational studies: 2 large retrospective population-based studies and 8 prospective cohort studies. However, the evidence tables contained an additional 10 fair- or good-quality studies and 29 poor-quality studies.

For question 2, only studies reporting patient outcomes are included in this DARE abstract. Eighteen fair- or good-quality studies were referred to in the synthesis.

For question 3, no studies were identified.

Two fair-quality cross-sectional studies were included for question 4. Two poor-quality cohort studies were also identified, but were not included in the synthesis because of potential biases.

For question 5, no studies that examined outcomes of TOL or ERCD were identified.

1. What are the relative harms associated with a TOL (spontaneous onset, induced and augmented) and repeat Caesarean?

   **Maternal outcomes.**

   Maternal death rates did not differ between TOL and ERCD (6 studies). One of 2 studies that assessed maternal haemorrhage requiring transfusion found statistically significantly more patients in the ERCD group than the TOL group required transfusion (1.72% versus 0.72%). One large population-based study found that hysterectomy rates did not differ between TOL and ERCD (0.2% in each group). The rates of infection were increased in ERCD versus TOL (6.4 to 9.73% versus 5.3 to 6.79%). Studies consistently reported significantly increased risk of infection for women who had a TOL but ultimately ended with a Caesarean delivery (e.g. failed TOL). There was conflicting evidence on whether induction of labour has any effect on infection rates.

   **Infant outcomes.**

   There was insufficient evidence about the effect of selected route of delivery on Apgar scores. No study has measured infant death directly attributable to a mother's choice of TOL or ERCD. Two large population-based studies provided evidence about whether TOL poses an increased risk of infant death compared with ERCD: one study reported perinatal death rates of 90/10,000 with TOL versus 50/10,000 with ERCD; the other reported perinatal death rates of 12.9/10,000 with TOL versus 1.1/10,000 with ERCD.

2. What is the incidence of uterine rupture, and are there methods for preventing major maternal and infant morbidity or mortality due to uterine rupture?

   There was no statistically significant difference in the rates of asymptomatic uterine rupture between TOL and ERCD (16.4/1000 versus 12.9/1000, pooled risk difference -0.003, 95% CI: -0.013, 0.007), based on 3 studies.

   There was an additional risk of 2.7/1,000 for symptomatic uterine rupture for TOL over ERCD (pooled risk difference 0.003, 95% CI: 0.0007, 0.005), based on 2 studies.

   Six of 10 studies reporting uterine rupture-related perinatal death reported no cases; the remaining 4 studies reported rates of 4 to 20%. Among 12 studies, 11 uterine-rupture related perinatal deaths were reported in 202 cases of uterine rupture, suggesting that the risk of perinatal death due to uterine rupture is 5%. Given a symptomatic uterine rupture rate of 3/1,000 and a 5% chance of perinatal death due to uterine rupture, the perinatal death rate due to TOL would be expected to be 1.5/10,000.

   Six studies reported on uterine rupture-related hysterectomy, with rates ranging from 0 to 33%. Among the 6 studies, 26 uterine-rupture related hysterectomies were reported in 159 cases of uterine rupture, suggesting that the risk of
hysterectomy due to uterine rupture is 16%. Given a symptomatic uterine rupture rate of 3/1,000 and a 16% chance of hysterectomy due to symptomatic uterine rupture, the hysterectomy rate due to TOL would be expected to be 4.8/10,000.

There was no significant difference in the rates of uterine rupture between labour induction (all methods pooled together) and spontaneous labour (pooled risk difference 0.31%, 95% CI: -0.09, 0.72; 8 studies).

3. What are the health status and health-related quality of life for VBAC and repeat Caesarean patients?

No studies were identified that evaluated health status or health-related quality of life with a prior Caesarean delivery after a TOL, repeat Caesarean delivery, VBAC or ERCD. No studies of the general birthing population or general postpartum population presented data on subgroups of women with prior Caesarean delivery.

4. Regarding VBAC and repeat Caesarean, what factors influence patient satisfaction or dissatisfaction with their childbirth experience?

No study measured satisfaction for VBAC, TOL followed by Caesarean delivery, or ERCD in women with a prior Caesarean delivery.

5. How do legislation, policy, guidelines, provider characteristics, insurance type, and access to care affect health outcomes for VBAC candidates?

No studies were identified that reported on how legislation, policy, guidelines, hospital characteristics, provider characteristics, insurance type or access to care affect the safety of TOL or ERCD.

Cost information

The review included a question about how economic outcomes are related to VBAC, repeat Caesarean delivery and their respective complications. The authors concluded that, based on the economic evaluation with the best quality score, when the probability of vaginal delivery is 76% or greater, TOL is more cost-effective and provides higher quality of life. Assuming costs per quality-adjusted life-year of $50,000 as cost-effective, the relative cost-effectiveness of TOL and ERCD depends on the probability of successful VBAC after TOL. Further evaluation of the sensitivity of the probability cut point of 76% to other potential predictor variables is needed.

Authors’ conclusions

There are striking deficiencies in the literature about the relative benefits and harms of TOL versus ERCD for women with prior Caesarean delivery. Obtaining accurate data should be a high research priority.

CRD commentary

The review question was relatively clear in terms of the interventions, participants and outcomes of interest. Whilst the authors did not state which study designs were eligible for inclusion, some study designs were explicitly excluded. The search strategy was adequate and the search terms were reported. However, studies published only as abstracts, and non-English language studies were excluded, thus increasing the potential for publication bias and language bias. Publication bias was not assessed. The majority of the study selection process was carried out by one reviewer, with a random set of titles and abstracts assessed for relevance by two reviewers. The data extraction was also carried out by one reviewer, who consulted a second reviewer when difficulties in interpreting the data were encountered. Therefore, the potential for reviewer bias and error exists. The included studies were assessed for quality using appropriate criteria and only studies that were rated as good or fair quality were included in the synthesis.

The number of studies reported in the results and the number of studies in the evidence tables were inconsistent for at least one of the questions. Heterogeneity was assessed and some studies were combined using a random-effects model. Where statistical synthesis was not appropriate, a narrative synthesis was presented instead. The included studies were not described in adequate detail for the reader to assess whether it was appropriate to synthesise their results. In addition, the authors stated that definitions of outcomes were not reported for many studies, therefore, it might not have
been appropriate to pool their results. The authors' conclusions, that deficiencies in the literature do not allow truly informed decisions to be made, appear to follow from the evidence presented. However, other relevant studies might have been missed.

**Implications of the review for practice and research**

Practice: The authors stated that, owing to the deficiencies in the literature base, insufficient data are available to make informed decisions about appropriate delivery choices following Caesarean delivery.

Research: The authors stated many implications for further research, including the development of standardised reporting measures of disease severity and outcomes of delivery, and consistency in the definition of their conceptual cohort (e.g. in comparing TOL and ERCD, it is important to ensure that the ERCD group would have been eligible for a TOL). They also stated that further studies are needed to examine the impact of factors, such as the malpractice crisis and malpractice reform, on choices available and outcomes from TOL and ERCD.

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http://www.ahrq.gov/clinic/epcsums/vbacsum.htm

**Other publications of related interest**


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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract
contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.