Care of Women with

Breech Presentation

or

Previous Caesarean Birth
STATEMENT OF INTENT

Evidence-based best practice guidelines are produced to help health practitioners and consumers make decisions about health care in specific clinical circumstances. Research has shown that if properly developed, communicated and implemented, guidelines can improve care. The advice on caesarean section given in this guideline is based on epidemiological and other research evidence, supplemented where necessary by the consensus opinion of the expert development team based on their own experience.

While guidelines represent a statement of best practice based on the latest available evidence (at the time of publishing), they are not intended to replace the health practitioner’s judgment in each individual case.

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Where guidelines are modified for local circumstances, significant departures from the national guidelines should be fully documented and the reasons for the differences explicitly detailed.
Na te Whare Tangata o te Wahine kia ora te tangata

Ki te Whai Ao

Ki te Ao Marama

Tihei Mauri Ora

‘It is from the womb of a woman that gives life to mankind, into the world of light, a world in which to breathe and grow.’
ENDORSED BY

PARENT’S CENTRES NEW ZEALAND

The Paediatric Society of New Zealand

NEW ZEALAND COLLEGE OF MIDWIVES (INC)

Perinatal Society of New Zealand Inc

PASIFIKA MEDICAL ASSOCIATION

SUPPORTED BY

The Royal New Zealand College of General Practitioners

Women’s Hospitals Australasia
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PURPOSE

The purpose of this guideline is to summarise the latest New Zealand and international literature and, combined with local New Zealand expertise, to offer guidance that will provide clinicians (obstetricians, general practitioners and midwives) and women, with appropriate, accurate and balanced information on the risks and benefits of caesarean compared to planned vaginal delivery in those with breech presentation or previous caesarean.

It is hoped that this information will assist mothers, their babies, whānau and family to achieve positive birth experiences.
ABOUT THE GUIDELINE

FOREWORD

The New Zealand Guidelines Group Incorporated (NZGG) is a not-for-profit organisation set up to promote effective health and disability services. NZGG is funded by the Ministry of Health (MOH) and other government funders, and oversees the development and implementation of guidelines across the health and disability sectors in New Zealand. Guidelines make an effective contribution to this aim, by accessing the latest international studies and interpreting these in a practical way for adoption in the New Zealand setting.

GAPS BETWEEN CURRENT PRACTICE AND EVIDENCE

Caesarean rates within New Zealand have increased markedly over the past decade and vary significantly between regions (from 17.5% in Northland District Health Board (DHB) to 26.2% in Waitemata and Southland DHBs in 2001).\(^1,2\) The overall caesarean rate in New Zealand in 2001 was 22.1%. Caesarean rates at National Women’s Hospital (NWH) show the extent of the increase over the last decade (see Figure 1).

**Figure 1: Type of birth at NWH 1992 - 2000**

Source: NWH Annual Report 2000.\(^2\)

NVD = normal vaginal delivery
Concern about the increasing caesarean rates in the developed world has led to controversy over the ‘optimum’ caesarean rate and to proposals to reduce the rates. These attempts to reduce unnecessary caesareans need to be realistic since some women may have variable risk factors that require caesarean birth. All of the four indications for caesarean have shown an increase in the last decade at NWH (see Figure 2), as have other hospitals in New Zealand.

**Figure 2: Major indications for Caesarean Section – Time Trends 1992 – 2000**

![Bar chart showing major indications for caesarean sections from 1992 to 2000. The bars indicate the percentage for each indication each year.](image)


The factors that influence the caesarean figures are complex but the obvious variation in rates both within New Zealand and overseas suggests that practice may not be evidence-based. By focusing on the indications and evidence for caesarean, optimal practice can be more clearly determined. In the last decade in New Zealand, the caesarean rate has increased markedly, the perinatal mortality rate has decreased and there appears to be a slight increase in perinatal morbidity, as measured by 5-minute Apgar score (see Figure 3).

**Figure 3: Neonatal outcomes and Caesarean-Section Rates at NWH: 1992-2000**

![Line graph showing neonatal outcomes and caesarean-section rates from 1992 to 2000.](image)

EVIDENCE AND RECOMMENDATION GRADING SYSTEM

Each study was assigned an overall level of evidence for validity (+, ~ or x). See Appendix for details of the grading system. Study details and levels of evidence were summarised in evidence tables and used for the formulation of recommendations. Studies with an ‘x’ level of evidence had questionable validity and were not considered relevant to the decision-making around formulation of recommendations.

GUIDELINE DEVELOPMENT PROCESS

In 2000, the MOH commissioned the NZGG to work with the maternity sector to develop clinical guidelines to help reduce variability in caesarean rates and to determine safe and effective alternatives to caesarean. A working party was formed in February 2001 to identify the main issues to be covered by the guideline. The group met twice and identified five topic groups that potentially could be addressed by guideline development:

• breech position in the latter part of the third trimester
• vaginal birth after caesarean (VBAC)
• slow labour
• foetal distress
• best care in labour (pain relief, position, fluids etc).

In order to manage the breadth of the topic, it was agreed to first focus on the two topic areas:

• breech position
• VBAC.

A multidisciplinary group of health practitioners and consumers was convened as the guideline development team in 2002 and two subgroups formed, one to prepare a guideline for the care of women with breech presentation and the other to prepare a guideline on the care of women who have had previous caesarean birth.

The breech guideline development team met for the first time in April 2002 and the VBAC guideline development team met for the first time in June 2002 to finalise the clinical questions that had previously been suggested by the feasibility group. Ground rules and terms of reference were discussed and conflicts of interest identified. The group considered draft evidence tables and developed recommendations based on each of the clinical questions by using an NZGG Considered Judgment form (available at www.nzgg.org.nz).

The draft guideline was sent out for external peer review in October 2002. A second meeting of both subgroups was held in early December 2002, to discuss the draft guideline and comments made by external peer review, and to develop an algorithm and policy for implementation of the guideline. Endorsement was sought in February 2004.

The Search Strategy for the guideline is available online at www.nzgg.org.nz – click on ‘Guidelines/Publications’ then ‘Gynaecology and Obstetrics’ then the Guideline title, then ‘Search Strategy’. There is a lack of well-designed studies in the area of management of breech presentation and the management of vaginal birth after caesarean. More research is needed to adequately answer many of the questions in this guideline.
THE GUIDELINE DEVELOPMENT TEAM

The multidisciplinary team that developed this guideline included representatives from the New Zealand College of Midwives, Royal New Zealand College of General Practitioners, Nga Maia, Royal New Zealand College of Obstetricians and Gynaecologists, EPIQ (Effective Practice, Quality Improvement and Informatics Centre), Maternity Services Council, hospital management and a consumers’ organisation, Parents Centres New Zealand, Lower Hutt.

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DECLARATIONS OF COMPETING INTERESTS

Sources of funding and editorial independence
The guideline was developed by the NZGG and funded by the MOH. Participants were reimbursed for expenses and attendance at meetings and support provided for the guideline coordinator.

Declarations of competing interests within the guideline development team

Cindy Farquhar
• Reimbursement for conference travel and fees for speaking, examining and consulting from the NZGG, Royal Australian and New Zealand College of Obstetrics and Gynaecology and conference organisers

Karen Guilliland
• Director, PHARMAC
• Reimbursement for conference travel and fees for speaking and consulting from a number of professional bodies
Sharron Cole
• Hutt Valley District Health Board member
• Reimbursement for travel from the Chinese University of Hong Kong

There were no other conflicts of interest.

CONSULTATION

PEER REVIEW

A draft of this guideline was widely circulated to over 80 individuals/organisations for comment in October 2002 as part of the peer review process. Comments were received from the following organisations or individuals:

Auckland Obstetric Centre, Auckland
Australian and New Zealand College of Anaesthetists, Wellington
Council of Medical Colleges in New Zealand, Wellington
School of Nursing and Midwifery, Auckland University of Technology, Auckland
First Health (Waikato, Taranaki, Hawkes Bay, Northland, Auckland)
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Well Women’s Nursing Service, Auckland.
ENDORSEMENT

Professional Colleges and stakeholder organisations participating in the development of a NZGG guideline may be invited to endorse or support the final publication. ‘Supported by’ has been used by Colleges and Stakeholders who are either part of an Australasian College, or their organisation has a policy of not endorsing other organisation’s publications, or when the organisation has some underlying concerns about the publication but still thinks it is useful and wishes to support it. Decisions on the definition of support and endorsement are made by each College or stakeholder to meet their own policies.

ACKNOWLEDGEMENTS

We are grateful to the NZGG for their support and help in the preparation of this guideline.

We would like to thank members of the Caesarean Section Guideline Development Team for their contributions.

- Jo Rama wrote the section on Māori perspectives.
- Alec Ekeroma wrote the section on Pacific perspectives.

We would also like to thank the following people for their contributions:

- Mrs Sue Hall, Secretary, Cochrane Menstrual Disorders and Subfertility Group, Auckland
- Ms Sue Bidwell and Ms Margaret Paterson, NZ Health Technology Assessment (NZHTA), Christchurch.

We are also indebted to all the groups or individuals who made comments on the draft.
SUMMARY AND RECOMMENDATIONS

KEY MESSAGES

• Evidence-based information on the risks and benefits of caesarean and vaginal birth should be provided to women prior to birth so that they can make informed decisions and choices about their care.

BREECH PRESENTATION

• Breech presentation is associated with an increased risk of perinatal and long-term morbidity, even in term babies without congenital abnormalities, regardless of type of birth.

• If breech presentation exists at term, then women should be offered a caesarean delivery. After full and frank discussion of the risks and benefits to her and her baby, women may choose for themselves either vaginal or caesarean birth. Regarding short-term benefits, for every 30 caesarean sections performed for breech instead of vaginal delivery, one baby will avoid death or serious neonatal morbidity. Regarding short-term risks, for every 167 caesareans performed for breech instead of vaginal delivery, one mother will experience short-term morbidity (such as haemorrhage, anaemia, transfusion or infection). Long-term benefits and risks are not easily quantified.

• Expertise in vaginal breech birth remains important, and local training schemes should be implemented to maintain the skills for facilitating vaginal breech birth.

• External cephalic version (ECV) from 37 weeks gestation can change presentation from breech to cephalic in women with uncomplicated breech pregnancy (extended or flexed leg) and reduce the effectiveness of maternal positioning exercises. There is insufficient evidence to support the use of ECV before 37 weeks.

• Tocolysis with betamimetics to facilitate the process of ECV may reduce the caesarean rate. There is insufficient evidence to support the use of analgesia to facilitate ECV.

• Moxibustion is an acupuncture technique that involves burning herbal preparations to stimulate the acupoint by the 5th toe. It may be offered to women with breech presentation.
VAGINAL BIRTH AFTER CAESAREAN

• Women with previous caesarean with no contraindications to vaginal birth should be encouraged to labour spontaneously.

• All women who have had a previous caesarean must be referred for consultation with a specialist obstetrician during the antenatal period, preferably prior to 36 weeks.

• Pregnant women with two previous caesarean births and no additional risk factors for vaginal birth may be offered planned vaginal birth after discussing the risks and benefits.

• X-ray pelvimetry in women with previous caesarean is not recommended.

• In the majority of women with previous caesarean, induction of labour (IOL) may be associated with slightly lower rates of successful vaginal birth compared to women who are not induced. The small increased risk of uterine rupture with the use of prostaglandins should be considered when planning and conducting induction of labour, and this risk should be discussed with the woman.

• Limited data suggest that the careful use of Syntocinon augmentation may be used in women with previous caesarean.

• Pregnant women with previous caesarean may be offered an epidural although there is no evidence that this will improve the chance of successful vaginal birth.

• The possible benefits and risks of continuous electronic foetal monitoring (EFM) should be discussed with women with previous caesarean. Regardless of the chosen monitoring method, the foetal heart rate should be recorded. Abnormalities in the foetal heart rate may precede uterine rupture and specialist consultation should be sought immediately.

• Women with previous caesarean should be offered continuity of midwifery care during pregnancy, labour and birth.
RECOMMENDATIONS

INFORMED DECISION-MAKING

GOOD PRACTICE POINT

Evidence-based information on the risks and benefits of caesarean and vaginal birth should be provided to women prior to birth so that they can make informed decisions and choices about their care.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.

MĀORI PERSPECTIVES

GOOD PRACTICE POINTS

A cultural care plan for the whānau should be offered to Māori women.

Cultural awareness training programmes should be made available in each DHB to ensure that Māori women are able to access culturally appropriate birthing services.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.

PACIFIC PERSPECTIVES

GOOD PRACTICE POINTS

Hard or vigorous traditional massage of the baby in utero is not recommended.

Cultural awareness training programmes should be made available in DHBs to ensure Pacific women are able to access culturally appropriate birthing services.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.
# ANTEНАTAL MANAGEMENT

## RECOMMENDATIONS

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women with uncomplicated (extended or flexed leg) breech presentation at term should be offered a caesarean after full discussion of the risks and benefits. <em>(The evidence for this recommendation may not be applicable to all women with breech presentation. The study population was highly selected and not all the study clinicians had optimal experience with vaginal breech birth.)</em></td>
<td>B</td>
</tr>
<tr>
<td>Women with uncomplicated breech at 37 - 40 weeks should be offered ECV to increase the likelihood of cephalic presentation and vaginal birth.</td>
<td>A</td>
</tr>
<tr>
<td>There is currently insufficient information to adequately assess the risks of ECV. Low complication rates have been reported.</td>
<td>I</td>
</tr>
<tr>
<td>There is currently insufficient information to recommend ECV prior to 37 weeks.</td>
<td>I</td>
</tr>
<tr>
<td>Women with uncomplicated breech at 37 - 40 weeks may be offered tocolysis (with betamimetic drugs) to increase the success of ECV.</td>
<td>B</td>
</tr>
<tr>
<td>There is insufficient evidence to make specific recommendations about type of tocolytic treatment or dose.</td>
<td>I</td>
</tr>
<tr>
<td>There is insufficient evidence to recommend the use of spinal or epidural analgesia to facilitate ECV with the goal of increasing the likelihood of cephalic presentation or reducing the caesarean rate.</td>
<td>I</td>
</tr>
<tr>
<td>There is insufficient evidence to recommend routine and/or specific antenatal positioning exercises.</td>
<td>I</td>
</tr>
<tr>
<td>Moxibustion may be offered to women with breech presentation from 33 weeks of pregnancy to facilitate the change from breech to cephalic presentation.</td>
<td>B</td>
</tr>
<tr>
<td>There is insufficient evidence to recommend ultrasound estimation of foetal weight in women with breech presentation planning vaginal birth.</td>
<td>I</td>
</tr>
<tr>
<td>Pelvimetry, including magnetic resonance imaging (MRI), for women with breech presentation is not recommended.</td>
<td>B</td>
</tr>
<tr>
<td>There is insufficient evidence to recommend routine caesarean for women with the second twin presenting as breech.</td>
<td>I</td>
</tr>
<tr>
<td>There is insufficient evidence to recommend caesarean or vaginal breech birth for pre-term breech.</td>
<td>I</td>
</tr>
</tbody>
</table>

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.
Breech presentation should be identified antenatally and arrangements made for the woman to give birth in an appropriate facility, where possible.

Before and after ECV, EFM is recommended.

A PRACTICAL GUIDE FOR CARING FOR WOMEN IN LABOUR WITH BREECH PRESENTATION

When a breech presentation is identified, the informed choice and consent process should be clearly documented.

Continuity of care should be maintained wherever possible.

Women who elect to have vaginal birth should have immediate access to obstetricians/paediatricians and caesarean facilities.

In active labour with uncomplicated flexed or extended legs breech presentation at term, it is recommended that:

- amniotomy may be performed, with caution, when clinically indicated
- the infant’s heart rate monitoring is done by either intermittent auscultation every 15 - 30 minutes in active labour 1st stage and after each contraction in 2nd stage or by continuous EFM
- the essential elements of vaginal breech birth are to prevent trauma and delay (with associated hypoxia/asphyxia). Therefore:
  - total breech extraction should not be performed
  - active labour positions that facilitate the birth of the infant’s body and head should be encouraged
  - spontaneous birth of the infant’s body including the thorax should occur by maternal effort where possible
  - no traction (which may extend arms and cause trauma) should be applied to the infant’s body
  - during the delivery of the buttocks and thorax, the birth attendant is recommended to keep the infant’s back in the anterior position
  - the Lovsett manoeuvre, using gentle traction should be used to deliver extended or nuchal arms or may be used during assisted birth
  - controlled birth of the after-coming infant’s head is achieved by:
    - Mauriceau-Smellie-Veit (MSV) grip or forceps in a prone position
    - adapted MSV grip, maternal effort and/or support of the baby in active birth positions.

There should be immediate access to obstetricians/paediatricians and caesarean facilities.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.
CARE OF WOMEN HAVING VAGINAL BIRTH AFTER CAESAREAN

RECOMMENDATIONS

<table>
<thead>
<tr>
<th>Recommendation</th>
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<tr>
<td>Women with a previous caesarean with no additional risk factors should be offered VBAC. The risks and benefits of VBAC for individual women should be discussed and an informed decision made.</td>
<td>B</td>
</tr>
<tr>
<td>Women with a previous caesarean where the uterine incision is vertical should be advised there is an increased risk of uterine rupture and offered caesarean.</td>
<td>C</td>
</tr>
<tr>
<td>Women with a history of previous uterine rupture should be advised there is an increased risk of further uterine rupture and offered caesarean.</td>
<td>C</td>
</tr>
<tr>
<td>In pregnant women with previous caesarean requiring delivery, induction of labour may be offered if indicated. Women need to be advised of the potential risks and benefits of this procedure.</td>
<td>B</td>
</tr>
<tr>
<td>In women with previous caesarean in labour with poor uterine activity the careful use of Syntocinon may be considered.</td>
<td>C</td>
</tr>
<tr>
<td>All women who have had a previous caesarean must be referred for consultation with an obstetrician during the antenatal period, preferably prior to 36 weeks.</td>
<td>C</td>
</tr>
<tr>
<td>Pregnant women with previous caesarean may be offered an epidural although there is no evidence that this will improve the chance of successful vaginal birth.</td>
<td>C</td>
</tr>
<tr>
<td>The possible benefits and risks of continuous EFM should be discussed with women with previous caesarean. Abnormalities in the foetal heart rate may precede uterine rupture and specialist consultation should be sought immediately.</td>
<td>C</td>
</tr>
<tr>
<td>X-ray pelvimetry in women with previous caesarean is not recommended.</td>
<td>B</td>
</tr>
<tr>
<td>Pregnant women with two previous caesarean births and no additional risk factors for vaginal birth may be offered planned vaginal birth after discussing the risks and benefits.</td>
<td>C</td>
</tr>
</tbody>
</table>

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

GOOD PRACTICE POINTS

<table>
<thead>
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<tbody>
<tr>
<td>Women with previous caesarean should be offered continuity of midwifery care during pregnancy, labour and birth.</td>
</tr>
<tr>
<td>Full and unbiased information on choosing VBAC should be discussed on a case-by-case basis with the pregnant woman with previous caesarean to enable her to make an informed decision about her birth choices.</td>
</tr>
<tr>
<td>There should be immediate access to obstetricians/paediatricians and caesarean facilities.</td>
</tr>
</tbody>
</table>

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.
BACKGROUND

In most Western countries, the caesarean rate has risen markedly over the last three decades. In England, between 1970 and 1980, the rate doubled from 4 to 9%. It continued to rise slowly in the 1980s and doubled again in the 1990s to 21.3%. In the USA, the caesarean rate rose from 5% in 1970 to an all-time high of 25% in 1988 with a slight reduction to 22% in 1999.

Data from New Zealand also follow this trend of increasing caesarean. National Women’s Hospital (NWH) in Auckland is the largest women’s hospital in Australasia with approximately 8000 births per year and offers a range of services from primary to tertiary care. The caesarean rate at NWH has increased over the last decade from 17.1% in 1992 to 26.6% in 2000. It is acknowledged that rates may be higher at NWH because of its status as a tertiary centre although Middlemore Hospital, another tertiary centre has considerably lower rates. Time trends are not available from the Report on Maternity, an annual report analysing New Zealand maternity services. There are wide regional differences within New Zealand ranging from 16% in the Counties Manukau DHB to 24.6% in the Capital Coast DHB in 2001. Such a wide variation indicates that practice is not standardised within New Zealand. Unadjusted rates are higher in nulliparous women, in Europeans and Asians (compared to Māori and Pacific Island women), in older women and in private as opposed to public hospitals. However, when adjustments are made for age and parity, the caesarean rates overall are no different for Māori or Pacific Island women.

In 1985, the World Health Organisation (WHO) issued a consensus statement (and reaffirmed it in 1994) suggesting that there were no additional health benefits associated with a caesarean rate above 10 to 15%. This was based on an examination of estimates of the national caesarean rate and maternal and perinatal mortality rates from various countries. This has led to the publication of many papers assessing the indications for caesarean with the view to reducing caesarean rates.

Attempts have been made to account for the increasing numbers of caesareans. Hospital data indicate that rates of caesarean increase with increasing maternal age. Delaying childbearing until the fourth decade may have led to a consequent increase in the caesarean rate. Other factors include:

- increased use of EFM
- increased use of epidural anaesthesia
- decreased use of forceps
- improved safety of caesareans.
In addition, over the last few decades, women have been becoming more involved in the decision-making process regarding their care and treatment during childbirth. Caesarean on maternal request or ‘elective’ caesarean where there is no medical indication, is becoming more common in New Zealand.

Studies from other countries have reported a rate of maternal request for elective caesarean ranging from 5 to 48%. As a result of the increasing number of caesarean births, there is now a larger percentage of pregnant women who have had a previous caesarean, estimated to be as high as 36% in the US. Currently, in the developed world, approximately 30% of caesareans are repeat caesareans after primary caesarean, 30% are performed for dystocia (poor progress in labor), 11% are performed for breech presentation and 10% are performed for foetal distress. These figures have resulted in recommendations for practice that aim to reduce the number of primary caesareans (ie, caesareans for women who have not had a previous caesarean, regardless of parity) for dystocia and foetal distress and increase the rates of vaginal birth after caesarean (VBAC) to curtail the self-perpetuating effect of the procedure.

This guideline aims to carefully assess the evidence for the optimal care of women:
- with breech presentation
- with previous caesarean.

The clinical questions that drive these topics are listed below.

**BREECH PRESENTATION**

- In women with breech presentation at term (≥37 weeks), does planned caesarean result in improved maternal and foetal outcomes compared to planned vaginal birth?
- In women with breech presentation at term (≥37 weeks), does ECV result in an increased likelihood of cephalic presentation at onset of labour compared to no ECV?
- In women with breech presentation prior to term (<37 weeks), does ECV result in an increased likelihood of cephalic presentation at onset of labour compared to no ECV?
- In women with breech presentation presenting for ECV, does tocolysis result in an increased likelihood of cephalic presentation at onset of labour compared to no tocolysis?
- In women with breech presentation presenting for ECV, does analgesia result in an increased likelihood of cephalic presentation at onset of labour compared to no pain relief?
- In women with breech presentation at term, do antenatal maternal positioning exercises result in an increased likelihood of cephalic presentation at onset of labour compared to no exercises?
• In women with breech presentation, does acupuncture result in an increased likelihood of cephalic presentation at onset of labour compared to no acupuncture?
• In women with breech presentation at term, does ultrasound estimation of foetal weight result in better decisions about mode of birth than no ultrasound estimation of foetal weight?
• In women with breech presentation at term, does pelvimetry result in better clinical decisions about mode of birth than no pelvimetry?
• In women with a twin pregnancy with the second twin presenting as breech, does planned caesarean result in improved maternal and foetal outcomes compared to planned vaginal birth?
• In women with breech presentation in premature labour, does planned caesarean result in improved maternal and foetal outcomes compared to planned vaginal birth?
• For women with singleton breech presentation who plan vaginal birth or whose labours progress before planned caesarean can be performed, what constitutes best practice labour and birth care?

**VAGINAL BIRTH AFTER CAESAREAN**

• In pregnant women with previous caesarean, does planned vaginal birth have increased perinatal and maternal morbidity or mortality compared to elective caesarean?
• In pregnant women with a previous caesarean birth, what are the risks of uterine rupture?
• In pregnant women with previous caesarean birth, what are the risks and benefits of induction of labour?
• In pregnant women with previous caesarean birth, what are the risks and benefits of augmentation with Syntocinon?
• In pregnant women with a previous caesarean birth, does continuity of care result in an increased likelihood of vaginal birth compared to lack of continuity?
• In pregnant women with a previous caesarean birth, does specialist review result in an increased likelihood of vaginal birth and safer outcomes compared to non-specialist care (midwifery and general practice care)?
• In pregnant women with a previous caesarean birth, does epidural anaesthesia result in an increased likelihood of vaginal birth compared to no epidural?
• In pregnant women with a previous caesarean birth, does continuous EFM result in improved foetal and maternal morbidity and mortality compared to no monitoring?
• In pregnant women with a previous caesarean birth, does a focused discussion with written material result in an increased likelihood of vaginal birth compared to no focused discussion?
• In pregnant women with a previous caesarean birth, does pelvimetry assist in clinical decision-making about mode of birth?
• In women with two previous caesarean births, does VBAC have increased perinatal and maternal morbidity/mortality compared to elective caesarean?
GENERAL ISSUES FOR WOMEN AND THEIR CARERS CONSIDERING CAESAREAN

INFORMED DECISION-MAKING

GOOD PRACTICE POINT

Evidence-based information on the risks and benefits of caesarean and vaginal birth should be provided to women prior to birth so that they can make informed decisions and choices about their care.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.

There has been increasing emphasis on the need for all women to be involved in their medical care. In particular, women have become increasingly involved in decision-making about the type of birth they wish to undergo, considering their own personal preferences, individual circumstances and risk profile. Thus, it is important that all carers provide good quality, evidence-based (where possible) information about the risks and benefits of type of birth as a basis for informed consent and informed decision-making. This requirement is enshrined in the New Zealand Code of Health and Disability Services Consumer’s Rights 1996.

A recent report in the UK, the National Sentinel Caesarean Section Audit Report surveyed 2475 women among 40 randomly-selected maternity centres in England, Wales and Northern Ireland on their views about caesarean. Women were asked if they had been given enough or wanted more information in this pregnancy about a range of topics. Although 40% of women reported that they had sufficient information about the risks and benefits of caesarean, a significant proportion of women reported that they would like more information on the risks (48%) and benefits (43%) involved as they had either no or insufficient information about the procedure.

Nearly all women expressed a strong desire for a birth that was ‘the safest option for their baby’ and this was considered to be the most important aspect of the birth. Their own safety, a desire for a quick recovery and a birth that would not impede breastfeeding were also strong preferences.

There is little research on what information women actually need or want in order to make informed decisions about caesarean birth. In other aspects of maternity care, there appears to be a mismatch between what women experience and what they want to know, and health practitioners’ beliefs about their information needs. The information that is given to women is not the only input that goes into informed decision-making. Each woman brings her own previous experiences, beliefs and values, fears and information that has been acquired from other sources. She may also rely on others to help with her decision-making.

Women’s decision-making may be affected by how information is delivered. A number of different aspects of information provision can vary: who delivers it, whether birth is imminent,
the format of the information (e.g., leaflet, video, visual aids etc), how risk data are presented, the language of delivery, the degree of certainty and the amount of information.

The provision of information alone may not be sufficient to achieve informed decisions. Decision aids aim to assist the decision-making process. A Cochrane review has found that decision aids improve knowledge of options and outcomes, lead to more realistic expectations, reduce the decisional conflict associated with people feeling uninformed, and stimulate an active role in decision-making.\(^{17}\)

In the UK report, women were also asked to express their views about childbirth in general. Most women (63\%) agreed with the statement that ‘giving birth is a natural process that should not be interfered with unless necessary’. There was disagreement with both statements about the right of women to choose either a vaginal birth under any circumstances (73\%) or caesarean under any circumstances (50\%). Of all respondents, vaginal birth was preferred by 76.2\%, caesarean was preferred by 5.3\%, 6.5\% had no preference, 8.7\% reported that their preference would be governed by medical reasons and 3.3\% didn’t know.

An important overall finding of this report was that a significant proportion of women would like more information on the risks and benefits of birth options.

**RISKS ASSOCIATED WITH TYPE OF BIRTH**

There are risks associated with birth, regardless of the type of birth (see Table 1.1). The specific risks and benefits associated with each particular indication for caesarean are covered in the individual sections but there are also general risks associated with caesarean and planned labour that also need to be discussed with women before they can engage in the decision-making process.

Caesarean has traditionally been divided into either elective or emergency caesarean. The latter term is very broad and does not really indicate the degree of urgency involved. The National Confidential Enquiry into Perioperative Deaths has suggested that there are four grades of urgency associated with categorisation of caesarean:

1. immediate threat to the life of the mother or foetus (emergency)
2. maternal or foetal compromise that is not immediately life-threatening (urgent)
3. no maternal or foetal compromise but needs early birth (scheduled)
4. birth timed to suit the woman and staff (elective).\(^{8}\)

There are clearly different risks associated with these categories but limited information exists on the risks for each category.

This guideline only addresses alternative options for categories 3 and 4 where there may be alternative options for scheduled or elective caesareans.

Tables 1.1, 1.2 and 1.3 attempt to quantify the potential harms associated with type of birth in uncomplicated pregnancies to better inform the decision-making process. It is recognised that there is an increased risk of poorer outcomes associated with emergency
caesarean following planned labour than with elective caesarean. The figures provided are rough estimates as there is a lack of good quality evidence on which to base these estimates. Some of the estimates are derived from a randomised controlled trial comparing planned caesarean with vaginal delivery in women with breech presentation and other estimates are derived from a large cohort study comparing outcomes in women having VBAC or a second caesarean delivery. **The figures must be interpreted with caution.** These tables have not been able to rank risk eg, risk of urinary tract infection versus potentially life-threatening haemorrhage. Also, there are no tools to help us agree how much risk should be accepted in order to avoid a rarer but potentially serious or lethal complication. Finally, assessment of risk must distinguish between the risk associated with the condition for which caesarean is indicated and the risk associated with the procedure itself. The figures provided are rough approximations only. Definitive comparative evidence from complex decision analysis that takes into account the probabilities associated with all potential outcomes does not yet exist.

**Table 1.1: Maternal case fatality rate by type of birth 1997 - 1999 (UK)**

<table>
<thead>
<tr>
<th>Type of Birth</th>
<th>No of Women (000s)</th>
<th>Direct Deaths</th>
<th>Rate/million cases</th>
<th>Relative Risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal</td>
<td>1710</td>
<td>29</td>
<td>16.9</td>
<td>1.0</td>
</tr>
<tr>
<td>Elective Caesarean</td>
<td>130</td>
<td>5</td>
<td>38.5</td>
<td>2.3 (0.88 - 5.86)</td>
</tr>
<tr>
<td>Scheduled Caesarean</td>
<td>78</td>
<td>1</td>
<td>12.8</td>
<td>0.8 (0.10 - 5.55)</td>
</tr>
<tr>
<td>Urgent Caesarean</td>
<td>137</td>
<td>14</td>
<td>102.2</td>
<td>6.0 (3.18 - 11.40)</td>
</tr>
<tr>
<td>Emergency Caesarean</td>
<td>69</td>
<td>14</td>
<td>202.9</td>
<td>12.0 (6.32 - 22.65)</td>
</tr>
</tbody>
</table>


Notes:
- Direct death = deaths resulting from obstetric complications of the pregnant state, from interventions, omissions, incorrect Rx or from a chain of events resulting from any of the above.
- Emergency caesarean = immediate threat to life of the women or foetus.
- Urgent caesarean = maternal or foetal compromise, which is not immediately life threatening.
- Scheduled caesarean = needing early delivery but not maternal foetal compromise.
- Elective caesarean = at a time to suit patient and maternity team (note: all had a medical indication for caesarean).
Table 1.2: Other maternal risks

<table>
<thead>
<tr>
<th>Effect</th>
<th>RR (95% CI)</th>
<th>Evidence source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFFECTS AROUND THE TIME OF BIRTH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced with Planned CS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perineal pain*</td>
<td>1.76 (0.18 - 0.58)</td>
<td>RCT19</td>
</tr>
<tr>
<td>Uterine rupture</td>
<td>0.16 (0.18 - 0.54)</td>
<td>Large cohort20</td>
</tr>
<tr>
<td>Increased after Planned CS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Febrile morbidity</td>
<td>1.53 (1.29 - 1.81)</td>
<td>Large cohort21</td>
</tr>
<tr>
<td>Transfusion</td>
<td>1.55 (1.17 - 2.05)</td>
<td>MA of obs studies22</td>
</tr>
<tr>
<td>Thromboembolic complications</td>
<td>1.94 (1.27 - 2.95)</td>
<td>Large cohort21</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>2.55 (1.75 - 3.72)</td>
<td>MA of obs studies22</td>
</tr>
<tr>
<td>Not Different</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postpartum bleeding*</td>
<td>1.09 (0.41 - 0.93)</td>
<td>RCT23</td>
</tr>
<tr>
<td>Genital tract injury*</td>
<td>0.86 (0.67 - 1.08)</td>
<td>RCT23</td>
</tr>
<tr>
<td>Wound infection*</td>
<td>1.5 (1.0 - 2.2)</td>
<td>RCT23</td>
</tr>
<tr>
<td><strong>LONG-TERM EFFECTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced after a Planned CS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urinary incontinence*</td>
<td>0.62 (0.41 - 0.93)</td>
<td>RCT19</td>
</tr>
<tr>
<td>Not Different</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast feeding (at 3 months postpartum)*</td>
<td>0.98 (0.92 - 1.05)</td>
<td>RCT19</td>
</tr>
<tr>
<td>Fecal incontinence*</td>
<td>0.54 (0.18 - 1.62)</td>
<td>RCT19</td>
</tr>
<tr>
<td>Postnatal depression*</td>
<td>0.93 (0.70 - 1.24)</td>
<td>RCT19</td>
</tr>
<tr>
<td>Dyspareunia*</td>
<td>0.91 (0.72 - 1.14)</td>
<td>RCT19</td>
</tr>
<tr>
<td><strong>IMPLICATIONS FOR FUTURE PREGNANCIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased After CS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placenta previa</td>
<td>2.6 (2.3 - 3.0)</td>
<td>MA24</td>
</tr>
<tr>
<td>Placenta accreta</td>
<td>25 (3.4 - 184.5)</td>
<td>Obs study25</td>
</tr>
<tr>
<td>Placental abruption (for primiparas)</td>
<td>2.8 (n/a)</td>
<td>Cohort study26</td>
</tr>
<tr>
<td>Infertility (&gt; 3 years)</td>
<td>1.97 (1.01 - 3.81)</td>
<td>Cohort study27</td>
</tr>
<tr>
<td>Subsequent ectopic pregnancy</td>
<td>1.54 (n/a)</td>
<td>Cohort study26</td>
</tr>
<tr>
<td>Subsequent miscarriage</td>
<td>1.2 (n/a)</td>
<td>Obs study28</td>
</tr>
</tbody>
</table>
### Table 1.3: Risks to the foetus and baby

<table>
<thead>
<tr>
<th></th>
<th>CS</th>
<th>Vaginal birth</th>
<th>RR (95% CI) CS compared with vaginal birth</th>
<th>Evidence source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Increased after Planned CS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory problems (39 weeks)</td>
<td>1.78%</td>
<td>0.32%</td>
<td>6.0 (1.77 - 20.3)</td>
<td>Obs study(^2)</td>
</tr>
<tr>
<td>Admission to NICU</td>
<td>8.9%</td>
<td>4.3%</td>
<td>Unknown denominator</td>
<td>NWH Annual Report(^5)</td>
</tr>
<tr>
<td><strong>Not Different</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth trauma</td>
<td>7.2%</td>
<td>6.2%</td>
<td>Unknown denominator</td>
<td>NWH Annual Report(^5)</td>
</tr>
<tr>
<td>(Apgar &lt; 7 at 1 minute)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brachial plexus injury*</td>
<td>0.17%</td>
<td>0.58%</td>
<td>0.35 (0.08 - 1.47)</td>
<td>Cochrane review(^3)</td>
</tr>
<tr>
<td>Cerebral palsy</td>
<td>0.2%</td>
<td>0.2%</td>
<td>1.2 (0.4 - 3.3)</td>
<td>Systematic review(^\text{1\text{1}})</td>
</tr>
</tbody>
</table>

* In studies of breech presentation
MĀORI PERSPECTIVES

GOOD PRACTICE POINTS

- A cultural care plan for the whānau should be offered to Māori women.
- Cultural awareness training programmes should be made available in each DHB to ensure that Māori women are able to access culturally appropriate birthing services.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.

The caesarean birth rate for Māori women (15.2% in 2001) is the lowest rate of all other ethnic groups. However, the difference disappears when adjustments are made for parity and age.

Māori perspectives on birthing are not generic and each whānau, hapu and iwi have their own kawa (etiquette) and tikanga (custom). The impact of colonisation and the medicalisation of birthing over the last 40 years have had an impact on Māori birthing practices to the extent that traditional birthing practices are rarely practised anymore. For example, whānau tautoko (the presence of whānau in addition to the father) is important for Māori women in labour. In some circumstances when caesarean is required, health providers may seek to restrict whānau access to the theatre.

The diversity between both Māori midwives, Māori doctors and consumers means that there is a variety of opinions about care. Nga Maia recommends that it is crucial that the cultural care plan of the whānau is upheld within the context of these guidelines, and that the information given to whānau is provided in a manner that gives them the confidence to make informed choices. The final decision should always remain with the woman and whānau.

Lead Maternity Carers supporting those Māori women who choose for cultural reasons to birth against the recommendations of the guidelines, should not be discriminated against and every effort should be made to up-hold the cultural care plan of the whānau. Cultural awareness training programmes need to be made available by DHBs so that all providers are both clinically and culturally competent, to provide services to Māori women and their whānau.

The Nurses Amendment Act 1990 and the introduction of the Direct Entry Midwifery programme has enabled Māori midwives and whānau to reclaim traditional birthing practices. Nga Maia has played a significant part in this process and the Ti Hei programme provided at Waikato Polytechnic has also been instrumental in its stand to include traditional birthing wānanga (learning centres) for student midwives. Māori perspectives on birthing need further opportunities for debate and discussion as there is very little published.
PACIFIC PERSPECTIVES

GOOD PRACTICE POINTS

1. Hard or vigorous traditional massage of the baby in utero is not recommended.

2. Cultural awareness training programmes should be made available in DHBs to ensure Pacific women are able to access culturally appropriate birthing services.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.

Pacific women have a lower caesarean rate compared to European or Asian women. However, there is some evidence that with the increase in the national caesarean rate, the number of Pacific women delivered by caesarean is increasing (Middlemore Hospital data, to be published). The lower rate of caesareans that was observed in Pacific women may be explained by the fact that Pacific women have fewer interventions in pregnancy and labour and many are multiparous.

There are also other factors that may have contributed to a lower caesarean rate. There is the fear of operations, high expectations of a normal birth, unfamiliarity with palagi (foreigner) systems of medicine and care, respect for authority figures and the language barrier.

Pacific people, especially the 40% who were born in the islands and those raised in a traditional environment, believe that disease and ill-health are caused by strained spiritual relationships which are largely determined by a mix of cultural and social norms. Traditional medicine, which includes massaging and herbal remedies, has continued to play a large and important part in dispelling disease and restoring well-being.

Massaging has been used by traditional healers both in New Zealand and in the islands to effect versions of breech babies. Since the art is passed down orally through generations (usually along family lines), there are numerous variations in techniques and skills for turning the breech. Many Pacific women, especially those born in the islands and those who live with extended families, are likely to seek traditional healers for a massage on being informed that the baby is breech. Becroft and Gunn found that the higher stillbirth rate amongst Pacific neonates could be explained by the higher rate of intracranial haemorrhages following traditional massages of the pregnant abdomen.

Pacific people will respond well in most care environments where there are clear explanations that they can understand, respect for their culture and, where appropriate, involvement of family in decisions concerning care.
However, cultural and other needs may not be similar. Pacific people from different Pacific ethnic communities have dissimilar educational backgrounds and have had differing levels of exposure to cultural influences. Information that massaging is harmful to an unborn child may dissuade some but not convince others. An explanation that gentle massaging (‘milimili’) can be good for relieving pain while heavy massaging (especially one that causes pain), whether it is intended to effect the rotation of the baby or otherwise, can hurt the baby may have a better reception. Maternity providers need to be informed of the potential dangers of traditional massaging so that they can advise Pacific women.
INTRODUCTION

One of the indications for caesarean is breech presentation which occurs in 3 to 4% of term pregnancies. Premature labour carries a higher incidence of breech presentations (20% at 28 weeks) and the earlier the labour, the higher the incidence. There is a higher perinatal mortality and morbidity with breech presentation, due principally to prematurity, congenital malformations and birth asphyxia or trauma. Some of these risks persist regardless of mode of birth. Thus, any intervention that reduces breech presentation at term (eg, ECV, moxibustion and antenatal exercises) would be welcome.

Recent data from NWH, a major tertiary centre in New Zealand, indicate that the majority of women with breech presentation have their babies delivered by caesarean (92.4% of nulliparous women and 89.4% of multiparous women in 2000). The rates of vaginal breech birth have declined at NWH from 1.8% overall in 1991 to 1.1% in 2000.

There is concern that skills in vaginal breech birth are being lost. The number of opportunities for obstetric practitioners to learn and maintain the skills required to facilitate breech birth may be insufficient to guarantee expertise. There are no data available on the expertise of midwifery practitioners in facilitating breech birth.

If a woman presents at or beyond 37 completed weeks of gestation with a baby in breech presentation, the Lead Maternity Carer (LMC) must recommend to the woman that a consultation with a specialist obstetrician is warranted. Discussion with the woman (and others, if she so wishes) should include the options to:

- attempt an ECV
- plan either an elective caesarean or a vaginal breech birth.

The risks and benefits of each option should be discussed. The decision regarding ongoing clinical roles/responsibilities must involve a three-way discussion between the specialist, the LMC and the woman concerned.
EVIDENCE SUMMARY: KEY MESSAGES

• Evidence-based information on the risks and benefits of caesarean and vaginal birth should be provided to women prior to birth so that they can make informed decisions and choices about their care.

• Breech presentation is associated with an increased risk of perinatal and long-term morbidity, even in term babies without congenital abnormalities, regardless of type of birth.

• If breech presentation exists at term, then women should be offered a caesarean delivery. After full and frank discussion of the risks and benefits to her and her baby, women may choose for themselves either vaginal or caesarean birth. Regarding short-term benefits, for every 30 caesarean sections performed for breech instead of vaginal delivery, one baby will avoid death or serious neonatal morbidity. Regarding short-term risks, for every 167 caesareans performed for breech instead of vaginal delivery, one mother will experience short-term morbidity (such as haemorrhage, anaemia, transfusion or infection). Long-term benefits and risks are not easily quantified.

• Expertise in vaginal breech birth remains important, and local training schemes should be implemented to maintain the skills for facilitating vaginal breech birth.

• External cephalic version (ECV) from 37 weeks gestation can change presentation from breech to cephalic in women with uncomplicated breech pregnancy (extended or flexed leg) and reduce the effectiveness of maternal positioning exercises. There is insufficient evidence to support the use of ECV before 37 weeks.

• Tocolysis with betamimetics to facilitate the process of ECV may reduce the caesarean rate. There is insufficient evidence to support the use of analgesia to facilitate ECV.

• Moxibustion is an acupuncture technique that involves burning herbal preparations to stimulate the acupoint by the 5th toe. It may be offered to women with breech presentation.
ANTENATAL CARE OF WOMEN WITH BREECH PRESENTATION ALGORITHM

Women with uncomplicated singleton breech presentation

Note 1

>37 weeks?

YES

NO

Offer ECV

NO

Offer moxibustion

YES

Contraindication to ECV?

Note 2

NO

YES

Successful?

NO

Spontaneously converts to vertex

YES

Planned vaginal birth

Remains breech?

YES

Consider retiral of ECV or discuss birth options

Note 3

NO

Remains cephalic?

YES

NO

Remains cephalic?

YES

NO

Spontaneously converts to vertex

YES

NO

NO

YES

Discuss birth options

Note 3

NO

YES

Attempt ECV

Note 4

YES

NO

YES

NO

YES

NO

NEW ZEALAND GUIDELINES GROUP
NOTES TO ANTENATAL CARE OF WOMEN WITH BREECH PRESENTATION ALGORITHM

Note 1: Assessment in Antenatal Period
Consultation with an obstetrician prior to 36 weeks gestation
Uncomplicated single breech presentation:
  • extended or flexed leg breech
  • no foeto-pelvic disproportion
  • no hyperextension of foetal head
  • no foetal anomaly
  • no placenta praevia

Note 2: Contraindications to ECV
  • Multiple pregnancy
  • Antepartum haemorrhage
  • Placenta praevia
  • Established labour
  • Premature rupture of membranes
  • Severe pregnancy-induced hypertension
  • Maternal cardiac disease
  • Previous uterine surgery (apart from caesarean)
  • Cases in which caesarean is necessary
  • Lack of maternal consent

Note 3: Birth Options
  • Planned vaginal birth
  • Planned caesarean
Risks and benefits discussed

Note 4: Attempted ECV
  • ECV should be undertaken by appropriately trained professionals
  • Tocolysis may be used
  • Ultrasound may be used
  • A cardiotocograph is necessary
  • ECV should be performed close to facilities for emergency birth with caesarean
BREECH LABOUR AND BIRTH ALGORITHM

- Woman in labour with uncomplicated breech presentation
  - Note 5
  - Obstetrician informed and management plan discussed

- Known breech?
  - Yes
    - Planned vaginal birth?
    - Yes
      - Satisfactory progress?
      - No -> Review contraindications, discuss options, informed choice and consent
      - Yes
        - Syntocinon augmentation following amniotomy?
        - No
          - Continue with LMC & documented birth plan
          - Satisfactory progress resumes?
            - No
              - Caesarean
            - Yes
              - Fully dilated, breech on perineum?
                - No
                  - Vaginal birth
                - Yes
                  - Vaginal birth
  - No
    - Advanced labour/birth imminent?
      - No
        - Planned vaginal birth?
        - Yes
          - Satisfactory progress?
          - No
            - Syntocinon augmentation following amniotomy?
            - No
              - Caesarean
            - Yes
              - Satisfactory progress resumes?
                - No
                  - Caesarean
                - Yes
                  - Vaginal birth
      - Yes
        - Review contraindications, discuss options, informed choice and consent
        - Note 7
NOTES TO BREECH LABOUR AND BIRTH ALGORITHM

Note 5: Definition of Uncomplicated Breech

- Flexed or extended legs
- 37 - 42 weeks gestation
- No evidence of cephalopelvic disproportion (CPD)
- Clinical estimation of foetus <4 kg
- Well-flexed head
- No anticipated mechanical difficulty

Note 6: Progress of Labour

- Cervical dilatation:
  - at least 0.5 cm/hour from 3 cm for multipara
  - at least 0.5 cm/1.5 hours from 3 cm for nullipara/no previous vaginal birth
- Descent of buttocks to perineum within 2 hours from full dilation

Note 7: Labour Recommendations

- Active pushing not encouraged until buttocks on perineum
- Birth imminent after 1 hour active pushing
- Lovsett manoeuvre if birth of thorax is slow
- Controlled and gentle birth of head
  - Mauriceau-Smellie-Veit grip (or adaptations for active birth positions)
  - Forceps to aftercoming head
- No breech extraction
- Obstetrician should be informed at onset of labour and at onset of active pushing
- Hospital facilities for planned vaginal breech birth include skilled midwives, paediatricians and obstetricians with facilities for monitoring the labour, and anaesthetic and operating facilities for immediate caesarean
ANTENATAL MANAGEMENT

QUESTION 1
In women with breech presentation at term (>37 weeks), does planned caesarean result in improved maternal and foetal outcomes compared to vaginal birth?

RECOMMENDATION
Women with uncomplicated (extended or flexed leg) breech presentation at term should be offered a caesarean after full discussion of the risks and benefits. (The evidence for this recommendation may not be applicable to all women with breech presentation. The study population was highly selected and not all the study clinicians had optimal experience with vaginal breech birth.)

B

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

GOOD PRACTICE POINTS
Breech presentation should be identified antenatally and arrangements made for the woman to give birth in an appropriate facility, where possible.

Prior to 2000, evidence supporting elective caesarean came from hospital audit, a couple of small randomised controlled trials and consensus statements, but was inadequate to properly answer the question above. In 2000, a large international multicentre randomised controlled trial of planned vaginal birth versus planned caesarean for uncomplicated term breech was stopped prematurely because it confirmed that vaginal birth was more hazardous than elective caesarean. A Cochrane Systematic Review, Planned Caesarean Section for Term Breech Delivery, has now been published. It includes two small randomised controlled trials published in the 1980s and the large Term Breech Trial. This last trial originally had follow-up of six weeks and a later publication reported on follow-up at three months. Two large cohort studies were also identified but had a retrospective design.

The Cochrane Systematic Review only reported on short-term outcomes for mother and baby. It found that planned caesarean reduced both perinatal/neonatal mortality and neonatal morbidity by 67% (RR 0.33, 95% CI 0.19 - 0.56) but at the expense of a small increase in maternal morbidity of 29% (RR 1.29, CI 1.03 - 1.61). Maternal morbidity was defined as a short-term outcome: either postpartum bleeding, genital tract injury, wound infection, systemic infection or early postpartum depression. Perinatal/neonatal mortality (excluding fatal malformations) was reduced by 71% with a policy of planned caesarean (RR 0.29, 95% CI 0.10 - 0.86) and 5-minute Apgar score below 7 was reduced by 68% (RR 0.32, 95% CI 0.17 - 0.61). Rate of brachial plexus injury did not differ statistically between groups. Subgroup analysis in countries with high and low mortality rates indicated that the benefits of caesarean birth were greater in countries with low mortality rates than for countries with high mortality rates, to prevent 1 dead or compromised baby.
The results of the Cochrane Systematic Review were dominated by the Term Breech Trial, the merits of which have been the subject of considerable debate.

- Although the protocol required that births were attended by ‘skilled and experienced clinicians’ they were not available for 2.7% of vaginal births and 6.8% of caesareans. Licensed obstetricians (as opposed to skilled and experienced clinicians) were not present in 21.9% of vaginal births and 0.1% of caesareans. Sensitivity analysis excluding these clinicians indicated that the risk of the combined outcome of neonatal morbidity/mortality was still much greater for women having planned vaginal birth.

- There was a significantly larger number of babies weighing more than 4000 g in the planned vaginal birth group (5.8% versus 3.1%) which may have contributed to the poorer outcome in this group.

- Women agreeing to participate had no strong preference for type of birth (by virtue of the fact that they were willing to be randomised). This will affect the generalisability of results. Many women have strong preferences about type of birth.

- The recruitment rate achieved per centre varied considerably. Over a period of 39 months, 2088 women spread across 121 centres were randomised. This represents an average of 5 women per centre per year. Although breech presentation is only a small proportion of total term births, either the centres were small with only about 200 term births per year or the women randomised were only a proportion of all those eligible.

- There were differences in the care of babies defined as having ‘serious morbidity’. Fourteen babies were noted to have serious morbidity in the planned caesarean group yet 16 babies were admitted to a neonatal intensive care unit. Eight out of 39 babies in the planned vaginal birth group (20.5%) were not admitted to a neonatal unit despite serious morbidity.

Later follow-up of the Term Breech Trial indicated that at 3 months postpartum there was a lower risk of urinary incontinence in women who had caesarean (RR 0.62, 95% CI 0.4 - 0.9). There were no differences for any of the other outcomes between groups (breastfeeding, infant health, ease of caring, sexual relationships, pain, depression or views on childbirth).

Further analysis was carried out to determine if there was a subgroup of women who might escape the increased complication rate for vaginal births. No such subgroup was identified. In particular, age, parity, estimated foetal weight or size, type of breech presentation, gestational age, ruptured versus unruptured membranes or previous attempts at ECV did not result in any different outcome to the increased morbidity and mortality associated with vaginal breech birth.

Findings from a retrospective cohort study including 1050 women with breech presentation in Scandinavia confirmed the increased neonatal morbidity reported with vaginal birth. Acidaemia at birth, Apgar score below 7 at 5 minutes and referral to neonatal intensive care unit all occurred at higher rates in planned vaginal birth (5.3%, 3.6% and 8.9% respectively) than in planned caesarean birth (0, 0, and 4%). The rate of neonatal neurological morbidity was 24 per 699 (3.4%) in planned vaginal birth (18 cases with cerebral symptoms and 6 cases of brachial plexus palsy) compared to 1 case (cerebral symptoms)
after a planned caesarean. These differences were all statistically significant (p<0.002).

A further large cohort study of 33,834 breech births (1995-1999), supports the findings of increasing perinatal and neonatal mortality and morbidity in those infants undergoing vaginal birth compared to those infants undergoing caesarean.\textsuperscript{56}

There is a likelihood of bias in retrospective cohort studies but if this occurred it would have had the effect of strengthening the differences between vaginal and caesarean birth since women with a complicated (and therefore risky) pregnancy were more likely to be delivered by caesarean. Consequences for the mother were not assessed and only short-term outcomes for the neonate were evaluated.

Table 4.1: Outcomes from Cochrane Systematic Review, 2001

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Planned Caesarean</th>
<th>Planned Vaginal Birth</th>
<th>NNT</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Morbidity</td>
<td>9.2%</td>
<td>8.6%</td>
<td>167</td>
<td>0.03</td>
</tr>
<tr>
<td>Perinatal/Neonatal Death or Neonatal Morbidity (overall)</td>
<td>1.8%</td>
<td>5.7%</td>
<td>26</td>
<td>0.0001</td>
</tr>
<tr>
<td>In countries with low mortality rates like New Zealand the figures are as follows</td>
<td>0.8%</td>
<td>6.9%</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Perinatal/Neonatal Mortality (excluding fatal malformations)</td>
<td>0.3%</td>
<td>1.1%</td>
<td>125</td>
<td>0.03</td>
</tr>
<tr>
<td>5 minute Apgar &lt;7</td>
<td>0.9%</td>
<td>3.1%</td>
<td>46</td>
<td>0.0004</td>
</tr>
<tr>
<td>Brachial Plexus Injury</td>
<td>0.2%</td>
<td>0.6%</td>
<td>250</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Source: Hofmeyr et al.\textsuperscript{30}

In conclusion, women with breech presentation at term (singleton and no identified complications) have a reduction of 66% in the risk of neonatal morbidity or mortality with planned caesarean but at the expense of an increase of 29% in short-term maternal morbidity.

The lack of experienced clinicians who are skilled in vaginal breech birth is of concern.\textsuperscript{51,59} The Confidential Enquiry into Stillbirths and Deaths in Infancy in the UK has recently reported that the single most avoidable factor in causing stillbirths and deaths among breech babies is suboptimal care given during labour.\textsuperscript{50}

Practitioners need to be aware of the possibility of the following:

- women with breech presentation at term may choose to have a planned vaginal birth
- caesarean may be planned but labour may develop rapidly and unplanned vaginal birth occur (nearly 10% of women randomised to caesarean in the Term Breech Trial had a vaginal birth)
- labour and birth may occur at a site where facilities for caesarean may not be available
- undiagnosed breech.
QUESTION 2
In women with breech presentation at term (≥37 weeks) does external cephalic version (ECV) result in increased likelihood of cephalic presentation at onset of labour compared to no ECV?

QUESTION 3
In women with breech presentation prior to term (<37 weeks), does ECV result in an increased likelihood of cephalic presentation at onset of labour compared to no ECV?

RECOMMENDATIONS

Women with uncomplicated breech at 37 - 40 weeks should be offered ECV to increase the likelihood of cephalic presentation and vaginal birth. A

There is currently insufficient information to recommend ECV prior to 37 weeks gestation. I

There is currently insufficient information to adequately assess the risks of ECV. Low complication rates have been reported. I

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

GOOD PRACTICE POINT

Before and after ECV, EFM is recommended. ✔

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.

ECV involves applying pressure to the mother’s abdomen to turn the foetus in either a forward or backward somersault to achieve a vertex presentation. The goal of ECV is to increase the proportion of vertex presentations among babies that were formerly in the breech presentation near term, with the aim of increasing the chances of a vaginal birth.

Use within New Zealand

There are no national data available on the rates of ECV although at least four centres offer it. There is clearly a large variation in the ECV rate within New Zealand hospitals and the rates of offering ECV vary from 8 - 30% of women with breech presentations. 61

Benefits

A Cochrane Systematic Review of ECV (last updated in July 1995) was identified. 62 (~)

No further randomised controlled trials were found. The review included 6 trials with a total of 612 women and compared ECV with or without tocolysis, with no ECV attempt. None of the women had experienced previous caesarean. Other contraindications were placenta praevia, congenital malformations, uterine anomalies, impaired foetal growth, suspected
rupture, and oligohydramnios. Only immediate perinatal outcomes were assessed. ECV at term was associated with a significant reduction in non-cephalic births (RR 0.42, 95% CI 0.35 - 0.50) and caesarean (RR 0.52, 95% CI 0.39 - 0.71). There was no significant effect on perinatal mortality (RR 0.44, 95% CI 0.07 - 2.92) or perinatal morbidity (Apgar score <7 at 5 minutes). However, the numbers studied were too small to give an accurate assessment of any risks of ECV.

The Cochrane review did not include women with previous caesarean. A small cohort study has assessed the success of ECV in 56 women who had previous caesarean. ECV was successful in 82% of women with previous caesarean compared to 61% who had not had a previous caesarean. This finding may have been affected by increased parity in the previous caesarean group (a factor that is associated with increased likelihood of successful ECV).

A decision analysis of options of care for term breech pregnancies (ECV, vaginal birth and caesarean) calculated predicted birth outcomes associated with each option. All women had no contraindications to either ECV or planned vaginal birth. The results were as follows:

<table>
<thead>
<tr>
<th>Mode of Birth</th>
<th>Caesarean Birth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECV + planned labour</td>
<td>25.4%</td>
</tr>
<tr>
<td>ECV + caesarean (unsuccessful ECV)</td>
<td>31.9%</td>
</tr>
<tr>
<td>Planned attempt at labour (no ECV)</td>
<td>62.6%</td>
</tr>
<tr>
<td>Planned caesarean (no ECV)</td>
<td>88.6%</td>
</tr>
</tbody>
</table>

Cost effectiveness of this option in New Zealand depends upon the utilisation of vaginal breech births and costs associated with the version protocol in individual hospitals. As vaginal breech delivery rates decrease then, the cost effectiveness of ECV will increase.

**Harms**

Despite its efficacy, ECV is not universally employed and it is possible that concerns about safety have limited its widespread use. In a cross-sectional study evaluating the outcomes in the first 2 years of an ECV service set up in Australia in 1997, Kleihauer testing (a test for foetal cells in the maternal circulation) was undertaken and no elevated levels found. Foetal bradycardia following ECV occurred in 2 cases out of 116 ECV attempts; both recovered in 2 minutes. A systematic review of ECV related risks reported that the most frequent complication from ECV was transient cardiotocograph (CTG) changes that were reported in 5.7% of all procedures. This complication seldom leads to the necessity of performing caesarean. However, careful foetal monitoring is essential when ECV is performed as transient bradycardia could also be a sign of compromised foetal condition. Nearly all CTG patterns return to normal when the procedure is stopped. The review reported that caesarean delivery was required after ECV 21 times after 7377 procedures and 4 cord complications were reported. The rate of foetal death reported in the review,
1.63 in 1000 version procedures, can be put into perspective by comparison with a foetal
death rate of 6.2 per 1000 births in a low risk pregnancy population between 36 and 40
weeks. In summary, there is no evidence of significant risks with ECV but foetal monitoring
during the procedure is recommended.

Predictors of Success of ECV

A recent observational study has assessed potential predictors of successful ECV. The study concluded that 3 variables were independently predictive of unsuccessful ECV: engagement of presenting part, difficulty in palpating the baby’s head and a tense uterus
on palpitation. Nulliparity was also associated with unsuccessful ECV. Scoring systems have
been developed to predict which women will have a successful version, but these have not
been validated by multiple studies.

Women’s Attitudes Towards ECV

A small Hong Kong survey assessed women’s attitude towards ECV. Most women (82%)
chose ECV as their first choice in managing breech presentation (when given the options
of ECV, elective caesarean and planned vaginal birth), mainly because a successful version
was a prerequisite for planning a vaginal delivery.

Implementation of ECV Program

A randomised controlled trial evaluated an educational package to promote ECV in the
UK. Prior to implementation, 20% and 19% of the intervention and control groups
respectively were offered ECV. After a multifaceted package including a workshop, written
material, guidelines and videos, the proportions were 36% (109/299) in the intervention
group and 15% (37/243) in the control group. The results of this trial suggest that this type
of educational package can alter clinical practice and increase the proportion of women
with breech presentation at term who are offered ECV.

Recommendations from other Groups

The following recommendations are presented in other evidence-based guidelines:

- all women with an uncomplicated breech pregnancy at term (37 - 42 weeks) should
  be offered ECV.
- because the risk of an adverse event occurring as a result of ECV is small, and the
caesarean rate is significantly lower among women who have undergone successful
version, all women near term with breech presentations should be offered ECV.

Thus, there is good evidence of the effectiveness of ECV in reducing the caesarean rate,
but insufficient evidence to assess harm. Women should be carefully selected.
Contraindications for ECV

The following contraindications are generally accepted:

<table>
<thead>
<tr>
<th>Absolute</th>
<th>Relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Multiple pregnancy</td>
<td>• Previous caesarean</td>
</tr>
<tr>
<td>• Antepartum haemorrhage</td>
<td>• Diabetes</td>
</tr>
<tr>
<td>• Placenta praevia</td>
<td>• Hypertension</td>
</tr>
<tr>
<td>• Established labour</td>
<td>• Impaired foetal growth</td>
</tr>
<tr>
<td>• Premature rupture of membranes</td>
<td>• Obesity</td>
</tr>
<tr>
<td>• Severe pregnancy-induced hypertension</td>
<td>• Foetal and uterine anomalies</td>
</tr>
<tr>
<td>• Severe maternal cardiac disease</td>
<td></td>
</tr>
<tr>
<td>• Previous uterine surgery (apart from caesarean)</td>
<td></td>
</tr>
<tr>
<td>• Cases in which caesarean is necessary</td>
<td></td>
</tr>
</tbody>
</table>

ECV Prior to Term (<37 weeks)

A Cochrane Systematic Review comparing ECV without tocolysis with no ECV attempt in women prior to term was identified. It included three trials with a total of 889 women. The 3 studies were undertaken over a period of 30 years, yet they demonstrated a consistency of results.

There was no significant effect of ECV before term (<37 weeks) on the following outcomes:

- non-cephalic presentation (RR 1.02, 95% CI 0.89 - 1.17)
- caesarean (RR 1.1, 95% CI 0.78 - 1.54)
- low Apgar scores (RR 0.81, 95% CI 0.44 - 1.49)
- perinatal mortality (RR 1.19, 95% CI 0.46 - 3.05).

There is some evidence from a study published in 1975 that the harms of ECV may be unacceptably high in pre-term infants with a foetal mortality rate of 0.9% and an overall complication rate of 4.4%. There is no good recent evidence of potential harms, although a recent case control study reported that women prior to 37 weeks with a successful ECV had a higher rate of obstetrical interventions (emergency caesarean, instrumental birth, and induction) than women with spontaneous cephalic presentation at birth. The authors suggested that a foetus with breech presentation was less tolerant of the stress of labour than a foetus with cephalic presentation.

Results from a randomised controlled trial comparing early ECV (at 34 - 35 weeks gestation) with delayed ECV (at 37 - 38 weeks gestation) in selected women on the likelihood of non-cephalic presentation at birth. The rationale for the trial was the possibility that nulliparous women may constitute a subgroup who would benefit from early ECV based on observations.
that nulliparas have both a lower spontaneous version rate after 32 weeks gestation compared to parous women and a lower rate of success when ECV is attempted at term.\textsuperscript{79,80} Results indicated that there was a reduction in the rate of non-cephalic presentation at birth and a reduction in the rate of caesarean with early ECV when compared to delayed ECV but the difference was not significant although probably of clinical significance. There was no difference in the risk of serious foetal complications and the rate of pre-term birth. A larger randomised trial to confirm these findings is currently being planned. A possible reason for the presumed benefits of early ECV is that this pilot study assessed outcomes at a slightly later stage than the Cochrane review that assessed outcomes from 32 weeks of the pregnancy.

In conclusion, there is no conclusive evidence that early ECV results in a greater likelihood of cephalic presentation and a reduction in the rate of caesarean when undertaken prior to 37 weeks gestation, although version at 34 to 35 weeks in nulliparous women may be beneficial. The current evidence does not indicate harm.

**QUESTION 4**

**In women with breech presentation presenting for ECV, does tocolysis result in increased likelihood of cephalic presentation at onset of labour compared to no tocolysis?**

**RECOMMENDATIONS**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women with uncomplicated breech at 37 - 40 weeks may be offered tocolysis (with betamimetic drugs) to increase the success of ECV.</td>
<td>B</td>
</tr>
<tr>
<td>There is insufficient evidence to make specific recommendations about type of betamimetic tocolytic treatment or dose.</td>
<td>I</td>
</tr>
</tbody>
</table>

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

The most widely used tocolytics have been beta-adrenergic drugs such as salbutamol, ritodrine or terbutaline. Intravenous nitroglycerin or sublingual glyceryl trinitrate spray have also been used as alternatives because of concerns about the side effects of betastimulants.\textsuperscript{81}

A Cochrane Systematic Review of 6 trials (617 women) assessing interventions to assist ECV demonstrated that routine tocolysis using betamimetics versus selective or no tocolysis was associated with fewer failures of ECV (RR 0.74, 95% CI 0.64 - 0.87) in both multiparous and nulliparous women.\textsuperscript{82} The caesarean rate was also reduced (3 trials, RR 0.85, 95% CI 0.72 - 0.99). Foetal bradycardia was significantly reduced in the treatment group (RR 0.12, 95% CI 0.03 - 0.54). Two additional trials (not included in the meta-analysis) were also identified in the review that compared nitroglycerin with terbutaline\textsuperscript{83} and sublingual glyceryl trinitrate spray with placebo spray. In this latter trial, women were included if they had experienced unsuccessful ECV. No significant differences were found between groups although the trial was underpowered.\textsuperscript{84} The Cochrane Systematic
QUESTION 5
In women with breech presentation presenting for external ECV, does regional analgesia result in improved likelihood of cephalic presentation at onset of labour compared to no pain relief?

RECOMMENDATION
There is insufficient evidence to recommend the use of spinal or epidural analgesia to facilitate ECV with the goal of increasing the likelihood of cephalic presentation or reducing the caesarean rate.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

A Cochrane Systematic Review assessed the effects of analgesia (spinal or epidural) on pregnancy outcomes for women with breech presentation attempting ECV. There was disagreement between the three trials included in the review. Unsuccessful ECV, non-cephalic birth rate and caesarean rate were significantly reduced in two trials but not the third. The overall differences were not statistically significant. In one trial, there was less maternal discomfort with spinal analgesia. There were no differences in foetal heart rate changes or maternal hypotension.

Likelihood of harm has not been adequately investigated. A case series of 68 women reported two perinatal complications: one infant required monitoring and antibiotic treatment for chorioamnionitis and the other had transitory respiratory distress following acute foetal distress that led to emergency caesarean.

In conclusion, because of conflicting results, the use of regional analgesia cannot be recommended.

QUESTION 6
In women with breech presentation at term, do antenatal positioning exercises result in improved likelihood of cephalic presentation at onset of labour compared to no exercise?

RECOMMENDATION
There is insufficient evidence to recommend routine and/or specific antenatal positioning exercises.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.
A Cochrane Systematic Review assessed the effects of postural management of breech presentation on presentation at birth, type of birth and perinatal outcome. Five small randomised controlled trials of 392 women were included in the review. Postural management was described as relaxation with the pelvis in an elevated position. No effect of postural management on the rate of non-cephalic births was detected, either for the subgroup in which no ECV was planned, or for the group overall (RR 0.95, 95% CI 0.81 - 1.11). No differences were detected for caesarean rate or Apgar scores below 7 at one minute.

In conclusion, there is insufficient evidence of benefit for postural management for women with breech presentation at term.

**QUESTION 7**

**In women with breech presentation does acupuncture result in improved likelihood of cephalic presentation at onset of labour compared to no acupuncture?**

**RECOMMENDATION**

Moxibustion may be offered to women with breech presentation from 33 weeks of pregnancy to facilitate the change from breech to cephalic presentation.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

Three randomised controlled trials and a number of case studies were identified that assessed moxibustion, a type of acupuncture procedure. One of the randomised controlled trials was of poor quality and it was not possible to distinguish results separately for breech presentation.

Moxibustion has been the most studied acupuncture technique. This is a traditional Chinese method that utilises the heat generated by burning herbal preparations containing the moxa plant (*Artemisia vulgaris*) to stimulate acupoint BL 67 (beside the outer corner of the 5th toenail). The technique consists of lighting a moxa stick and bringing it close to the skin until it produces hyperaemia due to local vasodilation. The intensity of moxibustion is just below the individual tolerability threshold but it does not produce burns. Women can be instructed to undertake moxibustion therapy at home. Sessions last 15 to 20 minutes and are administered daily for several days.

An open randomised controlled trial conducted in China of 260 primigravid women in the 33rd week of pregnancy with breech presentation was identified. Women with persistent breech presentation after two weeks of treatment could undergo ECV anytime between 35 weeks gestation and birth. Women treated with moxibustion had more foetal movements than the control group (48.45 versus 35.35 foetal movements, difference 13.08, 95% CI 10.56 - 15.6). At the 35th week of gestation, 75.4% of the treatment group and 47.7% of the control group had cephalic presentation (RR 1.58, 95% CI 1.29 - 1.94). Although 24 women in the control group and one woman in the treatment group underwent ECV, 75.4% of the 130 babies in the treatment group were cephalic at birth versus 62.3%
of the 130 babies in the control group (RR 1.21, 95% CI 1.02 - 1.43). The caesarean rate did not differ between groups. The open nature of the trial may have affected the subjective assessment of foetal movements but was unlikely to have affected the objective determination (by ultrasound) of successful version. There were no serious adverse events.

A more recent trial in 240 Italian women at 33 to 35 weeks gestation has confirmed these results. The change from breech to cephalic version was higher in the moxibustion group (53.6% versus 36.7%, p=0.01) and there was a lower proportion of caesareans indicated for breech delivery (52.3% versus 66.7%, p=0.03).

The observational studies that were identified all confirmed the results found in the randomised controlled trials. There are not enough data to thoroughly evaluate the safety of the technique.

These results indicate that moxibustion may be a promising technique but the results may not easily be applied to all New Zealand women. Two of the trials were performed in a country where acupuncture is an acceptable therapy for a number of different conditions. Future studies need to be performed in Western countries to further assess likelihood of harm and acceptability to the mother.

In conclusion, use of moxibustion in women with breech presentation may be associated with an increase in cephalic presentation prior to labour but there is limited evidence of a difference in the caesarean rate.

**QUESTION 8**

**In women with breech presentation at term does ultrasound estimation of foetal weight result in better decisions about mode of birth than no ultrasound estimation of foetal weight?**

**RECOMMENDATION**

There is insufficient evidence to recommend ultrasound estimation of foetal weight in women with breech presentation planning vaginal birth.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

There was only limited evidence on the role of ultrasound in assisting decision making in breech presentation. No randomised controlled trials were identified.

One prospective cohort study reported on women with breech presentation who had ultrasound and compared them with a control. Infants that were identified as 3.5 kg or more were scheduled for elective caesarean. More elective caesareans were performed in the group that had ultrasound, while the control group had more emergency sections.92(\(\sim\)) There was no difference between groups in the overall caesarean rate. Another retrospective cohort study reported that vaginal birth increased from 45 to 57% in those women with breech presentation who had ultrasound, and that caesarean declined from 21 to 6%.93(\(\sim\))
QUESTION 9

In women with breech presentation at term does pelvimetry result in better clinical decisions about mode of birth than no pelvimetry?

RECOMMENDATION

Pelvimetry, including MRI, for women with breech presentation is not recommended.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

The role of pelvimetry in the decision-making process with women with breech presentation remains controversial and only limited information was identified.

Some retrospective studies have shown a high perinatal mortality and morbidity rate when a trial of labour was undertaken where pelvic dimensions were reduced. Another study found no relationship between birthweight, the radiological conjugate and the outcome of labour. A retrospective cohort study reported that the vaginal birth rate increased from 45 to 57% in those women with breech presentation who were selected for this type of birth and that the caesarean rate declined from 21 to 6%. Another cohort study found lower rates of caesarean and higher rates of vaginal birth in women who had no X-ray pelvimetry compared to those who had routine or selective pelvimetry.

One randomised controlled trial that assessed MRI pelvimetry in 235 women with breech presentation was identified. In the first group, pelvimetry results were revealed to the obstetricians and used as a basis for the decision on the mode of birth. In the second group, pelvimetry was also performed prior to birth but the results were not disclosed until eight weeks postpartum and the mode of birth was decided clinically. The use of pelvimetry did not significantly lower the overall caesarean rate but did significantly lower the emergency caesarean rate. Whether MRI pelvimetry selects cases accurately for vaginal birth, as claimed by the authors, or whether knowledge of pelvic adequacy gives the obstetrician confidence in allowing a trial of vaginal birth remains debatable. The Royal College of Obstetricians and Gynaecologists Guideline Number 14 on pelvimetry concludes that ‘there are no data to support the routine use of pelvimetry prior to term breech delivery’.

QUESTION 10

In women with a twin pregnancy, with the 2nd twin presenting as breech, does planned caesarean result in improved maternal and foetal outcomes compared to planned vaginal delivery?

The Hannah breech trial included subgroup analyses testing for interactions between method of estimation of foetal size or weight (clinical only versus ultrasonography [with or without clinical]) and the treatment group (planned vaginal or planned caesarean) for foetal morbidity and mortality outcomes. No significant interactions were found.
One small systematic review comparing caesarean of a non-vertex second twin, with vaginal birth of a non-vertex second twin, did not report any significant differences between the two groups except for an increase in maternal febrile morbidity in the caesarean group.\(^{101}\) (~)

**QUESTION 11**

In women with breech presentation in premature labour, does planned caesarean result in improved maternal and foetal outcomes compared to planned vaginal birth?

**RECOMMENDATION**

There is insufficient evidence to recommend caesarean or vaginal breech birth for pre-term breech.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

One Cochrane Systematic Review reporting 6 randomised controlled trials involving 122 women was found.\(^{102}\) (~) All trials reported recruiting difficulties. Babies in the elective caesarean group were less likely to have respiratory distress syndrome (OR 0.43, 95% CI 0.18 - 1.06) although they were more likely to have a low cord pH immediately after birth (OR 10.82, 95% CI 1.60 - 73.24). They were less likely to have neonatal seizures (0/39 versus 2/42) and there were fewer deaths (2/62 versus 6/60) but these differences did not reach statistical significance. However, their mothers were more likely to have serious morbidity (OR 6.44, 95% CI 1.48 - 27.89). Sixteen percent of women in the elective caesarean gave birth vaginally usually because the birth was too rapid to allow a caesarean. Eighteen percent of the expectant management group gave birth by caesarean. Retrospective cohort studies have reported conflicting results regarding the appropriate type of birth for the pre-term breech infant. One study reported no difference in neonatal mortality although fewer infants required artificial ventilation.\(^{103}\) (x) Another study reported that for infants <600 g the survival rate was too low to justify a caesarean, while for infants between 600 and 1000 g either type of birth was justifiable.\(^{104}\) (~) There were conflicting findings for infants >1000 g. Another study concluded that there was no evidence that a policy of routine caesarean is advantageous in the pre-term breech presentation between 29 and 36 weeks.\(^{105}\) (x)

It was not possible to exclude the likelihood of bias in these studies.
QUESTION 12
For women with singleton breech presentation who plan vaginal birth or whose labours progress before planned caesarean can be performed, what is the best labour and birth care?

Information was sought but is not available to assist midwives, clinicians and women in the practical concerns about caring for women in labour with breech presentation. The need for practical guidance was recognised and therefore the following practical guide has been developed by the Breech subgroup.

A PRACTICAL GUIDE FOR CARING FOR WOMEN IN LABOUR WITH BREECH PRESENTATION

GOOD PRACTICE POINTS

When a breech presentation is identified, the informed choice and consent process should be clearly documented.

Continuity of care should be maintained wherever possible.

In active labour with uncomplicated flexed or extended legs breech presentation at term, it is recommended that:

- amniotomy may be performed, with caution, when clinically indicated
- the infant’s heart rate monitoring should be done by either intermittent auscultation every 15 - 30 minutes in active labour 1st stage and after each contraction in 2nd stage or by continuous EFM
- the essential elements of vaginal breech birth are to prevent trauma and delay (with associated hypoxia/asphyxia). Therefore:
  - total breech extraction should not be performed
  - active labour positions that facilitate the birth of the infant’s body and head are encouraged
  - spontaneous birth of the infant’s body including the thorax should occur by maternal effort where possible
  - no traction (which may extend arms and cause trauma) should be applied to the infant’s body
  - during the delivery of the buttocks and thorax, the birth attendant should keep the infant’s back in the anterior position
  - the Lovsett manoeuvre, using gentle traction should be used to deliver extended or nuchal arms or may be used during assisted birth
  - controlled birth of the after-coming infant’s head should be achieved by:
    - Mauriceau-Smellie-Veit (MSV) grip or forceps in a prone position
    - adapted MSV grip, maternal effort and/or support of the baby in active birth positions.

There should be immediate access to obstetricians/paediatricians and caesarean facilities.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.
Continuity of care is the cornerstone of maternity services in New Zealand. It shows beneficial effects\(^1\) and has been identified by New Zealand women as important in their childbirth experience.\(^2\) Thus it is important to maintain continuity of care wherever possible.

A UK report published in 2000 stated that the single and most avoidable factor in causing breech stillbirths and death among breech babies was suboptimal care in labour.\(^3\) The report noted that there was clinical evidence of hypoxia in all but one case before birth, and delays in staff response to foetal compromise occurred in nearly three-quarters of cases.

The role of foetal monitoring in reducing foetal compromise in breech infants is potentially a large one. Unfortunately, there is no evidence that specifically addresses this question. A systematic review of continuous EFM in both high- and low-risk pregnancies reported no evidence of significant differences in 1-minute Apgar scores below 4 or 7, admissions to neonatal units, perinatal deaths or cerebral palsy.\(^4\) The only clinically significant benefit from the use of routine continuous EFM was in the reduction in neonatal seizures. An increased rate of both caesarean (RR 1.41, 95% CI 1.23 - 1.61) and operative vaginal birth (RR 1.20, 95% CI 1.11 - 1.30) was associated with the use of EFM. The reviewers concluded that the decision to use routine continuous EFM or intermittent auscultation during labour should be a joint one between the pregnant woman and her caregiver. The extrapolation of results from this review must be done with caution because of the heterogeneous population that contains both high- and low-risk pregnancies. We do not have data that apply specifically to women with breech presentation and so there is no evidence of either benefit or harm for this group of women.

The WHO notes that auscultation of the foetal heart rate is usually performed every 15 - 30 minutes during active labour in 1st stage and after every contraction in 2nd stage.\(^5\) Foetal blood sampling from the buttocks provides an accurate assessment of the acid-base status, when the foetal heart rate trace is not reassuring.\(^6\) A study of the charts of 87 pregnancies complicated by true umbilical cord prolapse identified that obstetrical intervention contributed to 47% of umbilical cord prolapse in non-cephalic presentation (and twins). Of these 41 cases artificial rupture of membranes and application of foetal scalp electrodes preceded nine and four cases of umbilical cord rupture, respectively.\(^7\) For this reason, artificial rupture of membranes should be undertaken with caution and only when clinically indicated.

A Cochrane Systematic Review identified that there was not enough evidence to evaluate the effects of expedited vaginal birth (also known as assisted breech birth).\(^8\) Expedited breech birth refers to the careful delivery of the infant limbs and head. It does not breech extraction where the foetal legs and torso are delivered with some degree of traction, usually as a second twin or if there is some evidence of severe foetal distress or other emergency.

Consensus of expert opinion is that due to significantly increased perinatal morbidity and mortality associated with the birth method, total breech extraction should not be performed.\(^9\)
INTRODUCTION

Before the 1970s, the phrase ‘once a caesarean, always a caesarean’ dominated obstetric practice throughout Western countries. However, numerous studies have shown that successful vaginal births occur more often than not in women who have had a previous caesarean.

Data from NWH suggest that planned labour after previous caesarean birth has been declining over the last decade. For women at term with previous caesarean (any number), the rates of vaginal birth have fallen (from 50% of deliveries in 1992, to 33% in 2000) and the rates of caesarean have increased (from 50% of deliveries in 1992, to 67% in 2000). For women at term with only one previous caesarean, the rates of vaginal birth have fallen (from 48% in 1992, to 29% in 2000) and the rates of repeat caesarean have risen (from 52% in 1992, to 71% in 2000). A high number of women elected to have repeat caesarean where there was no clinical indication. Of all women who had any previous caesarean birth, 63.4% elected to have repeat caesarean. Of women who had one previous caesarean and no previous vaginal birth, 60.7% chose to have repeat caesarean.

In spite of these trends, a recent survey of approximately two thirds of members of The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) reported that the consensus of current practice is to present vaginal birth after caesarean (VBAC) as an option for the woman with a single prior caesarean birth to consider.

Most studies have found that, when all indications for primary caesarean are included, approximately 75% of women who attempt a vaginal birth following a prior caesarean birth will have a vaginal birth. The success rate varies according to the indication for the previous caesarean, from 67 to 85%. This success rate is similar to that of a nulliparous woman attempting a vaginal birth. A number of scoring systems have been used to predict likelihood of success but there is no completely reliable way to predict whether a planned vaginal birth will have a successful outcome. A previous vaginal birth in addition to a prior caesarean is more likely to predict a successful trial of labour than for a woman who has not had a previous vaginal birth.
EVIDENCE SUMMARY: KEY MESSAGES

- Evidence-based information on the risks and benefits of caesarean and vaginal birth should be provided to women prior to birth so that they can make informed decisions and choices about their care.
- Women with previous caesarean with no contraindications to vaginal birth should be encouraged to labour spontaneously.
- All women who have had previous caesarean must be referred for consultation with a specialist obstetrician during the antenatal period, preferably prior to 36 weeks.
- Pregnant women with two previous caesarean births and no additional risk factors for vaginal birth may be offered planned vaginal birth after discussing the risks and benefits.
- X-ray pelvimetry in women with previous caesarean is not recommended.
- In the majority of women with previous caesarean, IOL may be associated with slightly lower rates of successful vaginal birth compared to women who are not induced. The small increased risk of uterine rupture with the use of prostaglandins should be considered when planning and conducting IOL, and this risk should be discussed with the woman.
- Limited data suggest that the careful use of Syntocinon augmentation maybe used in women with previous caesarean.
- Pregnant women with previous caesarean may be offered an epidural although there is no evidence that this will improve the chance of successful vaginal birth.
- The possible benefits and risks of continuous EFM should be discussed with women with previous caesarean. Regardless of the chosen monitoring method, the foetal heart rate should be recorded. Abnormalities in the foetal heart rate may precede uterine rupture and specialist consultation should be sought immediately.
- Women with previous caesarean should be offered continuity of midwifery care during pregnancy, labour and birth.
VBAC ALGORITHM

Pregnant women with previous caesarean
Note 8

Discuss benefits and risks of planned vaginal birth
Note 9

Specialist review
Note 10

Antenatal care
Planned caesarean at 38 – 40 weeks

Is the woman suitable for planned vaginal birth?

Labour
Note 11

Is the use of Syntocinon appropriate?

Syntocinon augmentation
Note 12

Is the progress of labour satisfactory?

Elective caesarean

Emergency caesarean

Vaginal birth

See notes on page 38
### Note 8: Assessment in Antenatal Period

Consider:

- type of previous uterine incision
- gestational age
- other medical conditions

### Note 9: Risk-benefit Assessment

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced infection</td>
<td>Uterine rupture (0.2 - 1.5 %)</td>
</tr>
<tr>
<td>Reduced blood loss and transfusions, reduced blood clots</td>
<td>Need for emergency caesarean (30%)</td>
</tr>
<tr>
<td>Early mobilisation</td>
<td>Foetal distress + need for baby to go to neonatal unit</td>
</tr>
<tr>
<td>Reduced need for medical intervention</td>
<td>Disabled infant or neonatal death</td>
</tr>
<tr>
<td>Vaginal birth successful in 60 - 80% of women who labour after previous caesarean</td>
<td></td>
</tr>
</tbody>
</table>

NB: Risk of cerebral palsy/neonatal death is similar in all groups, except where uterine rupture occurs.

### Note 10: Specialist Review

- In accordance with the Maternity Reference Guidelines of the MOH, the LMC must recommend to the women or parents that a consultation with a specialist is warranted
- Women with breech, multiple pregnancy or placenta praevia should be recommended to have elective caesarean

### Note 11: In Labour

- Hospital facilities for planned vaginal birth include skilled midwives, paediatricians and obstetricians with facilities for monitoring the labour, and anaesthetic and operating facilities for immediate caesarean section
- Pain relief in labour is a personal choice
- Monitoring by auscultation or electronic methods is recommended
- Intravenous line and ‘Group + Hold’ are recommended
- The use of syntocinon is not contraindicated

### Note 12: Syntocinon

- There is no evidence on which to recommend the most effective syntocinon dose
- Length of Syntocinon use is limited to 6 hours
- Continue monitoring for uterine rupture as in Note 11
QUESTION 1
In pregnant women with previous caesarean does planned vaginal birth have increased perinatal and maternal morbidity/mortality compared to elective caesarean?

RECOMMENDATION

Women with a previous caesarean with no additional risk factors should be offered VBAC. The risks and benefits of VBAC for individual women should be discussed and an informed decision made.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

There are no randomised controlled trials comparing elective caesarean with planned vaginal birth in those with a previous caesarean. A meta-analysis of observational studies,\(^2\) two large retrospective cohort studies that controlled for confounding\(^2\) and one cohort study with no control for confounding\(^2\) were identified. The former two cohort studies controlled for a large number of confounding variables. The studies included 47,682, 313,238, 20,095 and 29,046 women respectively (see Table 5.1). No long-term outcomes were assessed.

A number of other cohort studies of lower quality were also identified.\(^1\)

Table 5.1: Risks associated with planned VBAC, unsuccessful VBAC and elective caesarean

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Elective Caesarean</th>
<th>Failed VBAC</th>
<th>Planned VBAC*</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perinatal Morbidity</strong> (Apgar score &lt;7 at 5 mins)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mozurkewich(^2)</td>
<td>0.9%</td>
<td>2.2%</td>
<td></td>
<td>0.0042</td>
</tr>
<tr>
<td><strong>Perinatal Mortality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mozurkewich(^2)</td>
<td>0.3%</td>
<td>0.6%</td>
<td></td>
<td>0.00025</td>
</tr>
<tr>
<td>Smith(^1)</td>
<td>0.01%</td>
<td>0.13%</td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>Rageth(^1)</td>
<td>0.09%</td>
<td>0.19%</td>
<td></td>
<td>0.031</td>
</tr>
<tr>
<td><strong>Uterine Rupture</strong> (excludes dehiscence)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mozurkewich(^2)</td>
<td>0.16%</td>
<td>0.39%</td>
<td></td>
<td>0.000081</td>
</tr>
<tr>
<td>Lydon Rochelle(^2)</td>
<td>0.16%</td>
<td>0.52%</td>
<td>signif – no figure</td>
<td></td>
</tr>
<tr>
<td>Rageth(^1)</td>
<td>0.19%</td>
<td>0.4%</td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>1.12%</td>
<td>0.14% (successful)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td><strong>Blood Transfusions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mozurkewich(^2)</td>
<td>1.7%</td>
<td>1.1%</td>
<td></td>
<td>0.00021</td>
</tr>
</tbody>
</table>

Continued...
Short-term Outcomes

Perinatal mortality and morbidity rates (as represented by Apgar score 5 minutes after birth) are reduced in women who have planned elective caesarean compared to women who attempt VBAC. Uterine rupture rates are also significantly reduced. Intrapartum maternal complication rates (blood transfusions, hysterectomies and fever rates) are significantly increased with caesarean. Failure of VBAC requires emergency caesarean that is associated with increased maternal and perinatal morbidity. Maternal mortality is rare for any mode of birth and there are insufficient data to assess the differences between groups in these large studies.

One of the studies has calculated the NNTs associated with mode of birth. Between 374 and 809 women would need to undergo elective repeat caesarean to prevent a single case of uterine rupture. Between 693 and 3332 women would need to undergo elective repeat caesarean to prevent a single foetal or neonatal death attributable to a trial of labour.

There are limitations to these findings. The studies did not distinguish between women who had one prior caesarean from those who had more than one prior caesarean. No distinction was made in the study population of women with previous caesarean between women who had previous vaginal birth (a predictor of successful vaginal birth) and those with no previous caesarean birth.

One of the studies also compared perinatal death outcomes in women, both multiparous and nulliparous who attempted vaginal birth. In this study of 313,238 Scottish women giving birth between 1992 and 1997, the perinatal mortality rate per 10,000 infants was 12.9 for women with previous caesarean attempting VBAC, 1.1 for planned repeat caesarean, 5.9 for multiparous women having vaginal births and 9.8 for nulliparous women having vaginal birth. Therefore, it can be seen that perinatal mortality rates were not significantly different between women with previous caesarean attempting VBAC and nulliparous women undergoing their first vaginal birth (12.9 versus 9.8 per 10,000 births, respectively).
In conclusion, elective caesarean in women with previous caesarean has lower rates of perinatal morbidity and mortality than planned VBAC but higher rates of maternal morbidity. VBAC has a success rate ranging from 60 to 80%, which is comparable to the vaginal birth rate in nulliparous women (see question 3 in this chapter). Unsuccessful VBAC in all women results in emergency caesarean and is associated with increased maternal and perinatal morbidity. More studies are required to adequately assess the effects of mode of birth on long-term outcomes.

Key Point

Although the risks to the infant are increased in labour after caesarean, compared to elective caesarean, they are similar to those for women in their first labour with vaginal birth. Balanced against the risk to the infant is the increased risks for the mother associated with elective caesarean, following previous caesarean.

QUESTION 2

In pregnant women with a previous caesarean, what are the risks of uterine rupture?

RECOMMENDATIONS

Women with a previous caesarean where the uterine incision is vertical should be advised there is an increased risk of uterine rupture and offered caesarean.

Women with a history of previous uterine rupture should be advised there is an increased risk of further uterine rupture and offered caesarean.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details

Uterine Scar

There are two types of uterine rupture. Complete rupture involves the full thickness of the uterine wall and presents usually as a dramatic emergency, which is potentially life threatening for both mother and baby. Incomplete rupture occurs when the peritoneum remains intact. It usually presents as an asymptomatic dehiscence of a previous uterine scar that may remain undiagnosed. This type of rupture is sometimes known as a ‘window’.

The type of scar influences the rate of uterine rupture. The rate of complete rupture for women with a low transverse incision has been estimated to range from 0.2 to 1.5%. By contrast, the risk of rupture after classical (a vertical incision of the abdomen and uterine wall) caesarean is quoted as ranging from 4 to 9% and has even been reported as high as 12% (see evidence table for question 1 [www.nzgg.org.nz – click on ‘Guidelines/Publications’ then ‘Gynaecology and Obstetrics’ then ‘Evidence Tables’ for this guideline]), a rate that most would consider too high to permit a trial of labour. Hysterectomy is required in 10% of uterine rupture cases. Symptomatic uterine rupture can carry a 45.8% perinatal mortality and a 4.2% maternal mortality, although other studies have reported lower risks.
Previous Rupture

A history of previous uterine dehiscence or rupture has a rate of repeat separation of 6.4% if the previous uterine incision was in the lower segment, and a rate of 32.1% if the scar is in the upper segment, with complication rates assumed to be similar to those of the primary uterine rupture.126

QUESTION 3

In pregnant women with previous caesarean what are the risks and benefits of induction of labour?

**RECOMMENDATION**

In pregnant women with previous caesarean requiring delivery, induction of labour may be offered if indicated. Women need to be advised of the potential risks and benefits of this procedure.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

IOL involves cervical ripening either using prostaglandins or rupture of the membranes and stimulation of uterine activity to produce cervical dilatation and effacement before the onset of spontaneous uterine contractions.

A number of methods have been investigated for cervical ripening and IOL. The commonly used ones include amniotomy, membrane stripping, prostaglandin F2α, misoprostol and oxytocin. However, although these methods have been well researched in women without previous caesarean, they have been rarely studied in women with previous caesarean. Furthermore, many of the identified studies do not distinguish between induction and augmentation.

**Benefits**

The major benefit of IOL over elective caesarean is the enabling of a proportion of women to have a successful vaginal birth. There are no randomised controlled trials that compare IOL with spontaneous labour in women with previous caesarean that report this outcome. A systematic review, published in 2000, identified a number of observational studies that reported rates of uterine rupture and vaginal birth (see Tables 5.2 and 5.3).127(～) Nearly all of the studies reported a lower rate of vaginal birth following IOL compared to spontaneous onset of labour.

In women with PGE2 IOL, 64% delivered vaginally compared to 78% of women with spontaneous onset of labour (OR 0.45, 95% CI 0.4 - 0.50). In women with oxytocin IOL, 75% delivered vaginally compared to 82% with spontaneous onset of labour (OR 0.52, 95% CI 0.46 - 0.60). Induction, but not augmentation, is a major risk factor for unsuccessful VBAC.21(〜) It is important to note that all of these data are confounded by the fact that if IOL is considered necessary, then the likelihood of vaginal birth is reduced, regardless of
whether or not the woman has had a previous caesarean. Unless IOL is indicated for clinical reasons, waiting for the spontaneous onset of labour affords a woman the best chance of vaginal birth.

**Risks**

The main concern with IOL in women with previous caesarean birth is whether or not there is an increase in uterine rupture. The studies that report this outcome for different induction methods are summarised in Table 5.4. It is also important to note, that as uterine rupture is a rare event, most studies are not large enough to adequately assess whether there is an increase in rupture with these induction methods. With an assumed background rupture risk of 0.5%, prospective studies would have to include about 10,000 women in order to show a twofold increased relative risk.¹³⁰

**PGE2**

An analysis of mostly retrospective cohorts reported that the incidence of uterine scar disruption was not statistically different in women who received PGE2 than in those admitted for spontaneous labour [27/1682 (1.6%) versus 136/11,097 (1.23%), OR 1.46, 95% CI 0.96 - 2.22]. Although not significant, there appears to be a trend towards a possible increase of risk with PGE2.

**PGE1**

An evaluation of three studies that compared PGE1 (misoprostol) with spontaneous labour in women with previous caesarean found an increased rate of scar disruption in women treated with misoprostol than in women awaiting spontaneous labour (5.4% versus 1.3%, OR 7.53, 95% CI 2.75 - 20.6).¹²⁷ These rates of uterine rupture are generally higher than rates reported with other prostaglandins or oxytocin. In a small randomised controlled trial of 38 women with previous caesarean birth, misoprostol was compared with oxytocin.¹²⁸ The trial was terminated prematurely because of safety concerns with misoprostol and in particular, two of 17 women receiving misoprostol had scar disruption.

**Oxytocin**

The mostly retrospective cohorts of oxytocin reported that the incidence of uterine scar disruption was no different in women who received oxytocin than in those in spontaneous labour (0.83% versus 0.62%, OR 1.43, 95% CI 0.76 - 2.69) (Table 5.4). A small underpowered randomised controlled trial has compared vaginal prostaglandin E₂ with oxytocin in 42 women with previous caesarean undergoing labour induction.¹²⁹ More women in the oxytocin group than in the prostaglandin group had a repeat caesarean because they failed to establish labour.

More recently, a large cohort study (20,095 women) has assessed rates of rupture in women with previous caesarean. Uterine rupture occurred at a rate of 1.6 per 1000 births among women with repeated caesarean delivery, 5.2 per 1000 births among women undergoing VBAC, 7.7 per 1000 births among women undergoing VBAC who were induced (not with prostaglandins) and 24.5 per 1000 births among women undergoing VBAC who were
induced with prostaglandins (type not specified). The risk of rupture was significantly different for all these groups compared to repeated caesarean (spontaneous labour, not induced: RR 3.3, 95% CI 1.8 - 6.0; induction of labour without prostaglandins: RR 4.9, 95% CI 2.4 - 9.7; induction of labour with prostaglandins: RR 15.6, 95% CI 8.1 - 30.0). There were insufficient data to determine the risk of rupture associated with different types of prostaglandin. Overall, this large cohort study demonstrates an increased risk of rupture with induction in women with previous caesarean compared to women undergoing repeat caesarean, particularly with prostaglandins, but the absolute risk of rupture is still relatively low. Large randomised controlled trials are required to determine the safest agent for induction.

Table 5.2: Uterine rupture rates with previous caesarean

<table>
<thead>
<tr>
<th>Rate/1000 live births</th>
<th>RR of rupture (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeat caesarean</td>
<td>1.6</td>
</tr>
<tr>
<td>VBAC and spontaneous labour</td>
<td>5.2</td>
</tr>
<tr>
<td>VBAC with IOL (not prosteaglandins)</td>
<td>7.7</td>
</tr>
<tr>
<td>VBAC with IOL with unspecified prosteaglandins</td>
<td>24.5</td>
</tr>
</tbody>
</table>


Key Points

In pregnant women at term with previous caesarean, IOL is associated with a decreased likelihood of successful vaginal birth compared to women who are not induced.

In conclusion, there is no evidence to suggest that IOL with oxytocin or PGE2 has significantly higher rates of uterine rupture compared to spontaneous labour. PGE1 appears to have higher rates of uterine rupture.
Table 5.3: Vaginal birth rates in women with previous caesarean deliveries undergoing cervical ripening with PGE2 and oxytocin versus spontaneous labour

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>IOL Group (%)</th>
<th>Spontaneous Labour (%)</th>
<th>Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PGE2 Studies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goldberg</td>
<td>1989</td>
<td>16/19 (84.2)</td>
<td>107/155 (69.0)</td>
<td>2.39 (0.67, 8.60)</td>
</tr>
<tr>
<td>Blanco</td>
<td>1992</td>
<td>18/25 (72.0)</td>
<td>46/56 (82.1)</td>
<td>0.56 (0.18, 1.69)</td>
</tr>
<tr>
<td>Behrens</td>
<td>1994</td>
<td>136/161 (84.5)</td>
<td>186/224 (83.0)</td>
<td>1.11 (0.64, 1.93)</td>
</tr>
<tr>
<td>Schneider</td>
<td>1994</td>
<td>41/60 (68.3)</td>
<td>55/82 (70.7)</td>
<td>0.89 (0.43, 1.84)</td>
</tr>
<tr>
<td>Flamm</td>
<td>1997</td>
<td>233/453 (51.4)</td>
<td>3513/4569 (76.8)</td>
<td>0.32 (0.26, 0.39)</td>
</tr>
<tr>
<td>Ravasia</td>
<td>2000</td>
<td>104/172 (60.5)</td>
<td>1205/1544 (78.0)</td>
<td>0.43 (0.31, 0.60)</td>
</tr>
<tr>
<td>Bebbington</td>
<td>2000</td>
<td>438/637 (68.8)</td>
<td>2074/2590 (80.1)</td>
<td>0.55 (0.45, 0.66)</td>
</tr>
<tr>
<td>Fleischman</td>
<td>2000</td>
<td>11/40 (27.5)</td>
<td>437/560 (78.0)</td>
<td>0.11 (0.05, 0.22)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>997/1567 (63.6)</td>
<td>7626/9780 (78.0)</td>
<td>0.45 (0.40, 0.50)</td>
</tr>
</tbody>
</table>

| **Oxytocin Studies** |      |               |                        |                     |
| O’Connor      | 1983 | 22/32 (68.8)  | 169/211 (80.1)         | 0.55 (0.24, 1.24)   |
| Paul          | 1985 | 23/32 (71.9)  | 395/443 (89.2)         | 0.31 (0.14, 0.71)   |
| Molloy        | 1987 | 374/418 (89.5)| 984/1062 (92.7)        | 0.67 (0.46, 0.99)   |
| Lao           | 1987 | 102/137 (74.5)| 446/529 (84.3)         | 0.54 (0.35, 0.85)   |
| Ravasia       | 2000 | 283/427 (66.3)| 1205/1544 (78.0)       | 0.55 (0.44, 0.70)   |
| Bebbington    | 2000 | 309/460 (67.2)| 2074/2590 (80.1)       | 0.51 (0.41, 0.63)   |
| Fleischman    | 2000 | 72/124 (58.1) | 437/560 (78.0)         | 0.39 (0.26, 0.59)   |
| **Total**     |      | 2231/1630 (75.0)| 5711/6939 (82.3)       | 0.52 (0.46, 0.60)   |

Source: Sanchez-Ramos et al, 2000.127
### Table 5.4: Uterine scar disruption in women with previous caesarean deliveries undergoing IOL with PGE2, PGE1 and oxytocin versus spontaneous labour: comparison group

<table>
<thead>
<tr>
<th>UTERINE SCAR DISRUPTION RATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td><strong>PGE2 Studies</strong></td>
</tr>
<tr>
<td>Goldberg</td>
</tr>
<tr>
<td>Blanco</td>
</tr>
<tr>
<td>Behrens</td>
</tr>
<tr>
<td>Schneider</td>
</tr>
<tr>
<td>Naeff</td>
</tr>
<tr>
<td>Flamm</td>
</tr>
<tr>
<td>Zelop</td>
</tr>
<tr>
<td>Ravasia</td>
</tr>
<tr>
<td>Bebbington</td>
</tr>
<tr>
<td>Fleischman</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
<tr>
<td><strong>PGE1 Studies</strong></td>
</tr>
<tr>
<td>Cunha</td>
</tr>
<tr>
<td>Plaut</td>
</tr>
<tr>
<td>Bennett</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
<tr>
<td><strong>Oxytocin Studies</strong></td>
</tr>
<tr>
<td>Molloy</td>
</tr>
<tr>
<td>Lao</td>
</tr>
<tr>
<td>Ravasia</td>
</tr>
<tr>
<td>Bebbington</td>
</tr>
<tr>
<td>Fleischman</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Source: Sanchez-Ramos et al., 2000.127
QUESTION 4
In pregnant women with previous caesarean, what are the risks and benefits of augmentation with synthetic oxytocin (Syntocinon)?

RECOMMENDATION
In women with previous caesarean in labour with poor uterine activity the careful use of Syntocinon may be considered.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

Most studies did not differentiate between oxytocin for induction and augmentation. The results of the studies (or subgroups) that reported on augmentation separately are summarised in Tables 5.5 and 5.6. All the studies are retrospective cohort studies with the exception of one randomised controlled trial that assessed the effects of expectant outpatient management (non-intervention) versus active inpatient management (intervention including oxytocin augmentation) on risk of protracted labour and caesarean birth in women with an unknown uterine scar but unfortunately did not report on the outcome of vaginal birth.

Benefits
The use of augmentation is associated with successful vaginal birth rates that vary from 69 to 88% but it is not possible to determine a pattern in the comparative success rates with spontaneous labour success rates in studies that have reported figures (see Table 5.5).

Risks
The studies that reported on the uterine rupture rates are summarised in Table 5.6. There are large variations in the reporting of uterine rupture between the studies but there are no significant differences in uterine rupture rates between those women who receive augmentation and those who do not.

Table 5.5: Vaginal birth rates in women with previous caesarean and augmentation in labour

<table>
<thead>
<tr>
<th>Study Details</th>
<th>Years of Study Deliveries</th>
<th>Spontaneous Labour Success Rates</th>
<th>Oxytocin Augmentation Success Rates</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flamm 1987</td>
<td>1984 - 1985</td>
<td>78%</td>
<td>69%</td>
<td>nr</td>
</tr>
<tr>
<td>Chelmow 1992</td>
<td>1975 - 1990</td>
<td>55%</td>
<td>74%</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>Sakala 1990</td>
<td></td>
<td>89%</td>
<td>88%</td>
<td>ns</td>
</tr>
</tbody>
</table>


nr = not reported   ns = not significant
Table 5.6: Uterine rupture rates in women with previous caesarean and augmentation in labour

<table>
<thead>
<tr>
<th>Study Details</th>
<th>Years of Study Deliveries</th>
<th>Uterine Rupture Rate with No Augmentation</th>
<th>Uterine rupture Rate with Oxytocin Augmentation</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flamm 1987</td>
<td>1984-1985</td>
<td>0.077%</td>
<td>0.41%</td>
<td>ns</td>
</tr>
<tr>
<td>Chelmow 1992</td>
<td>1975-1990</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Zelop 1999</td>
<td>1984-1996</td>
<td>0.4%</td>
<td>1%</td>
<td>ns</td>
</tr>
<tr>
<td>Rageth 1999</td>
<td>1983-1996</td>
<td>1.28%</td>
<td>0.46%</td>
<td>nr</td>
</tr>
</tbody>
</table>

Source: Sanchez-Ramos et al., 2000.\textsuperscript{127}

ns = not significant    nr = not reported

Key Point

The evidence for use of Syntocinon augmentation is limited. It is not possible to determine whether augmentation with oxytocin increases the likelihood of vaginal birth in women with previous caesarean or increases the risk of uterine rupture.

QUESTION 5

In pregnant women with a previous caesarean does continuity of care result in improved likelihood of vaginal birth compared to lack of continuity?

GOOD PRACTICE POINT

Women with previous caesarean should be offered continuity of midwifery care during pregnancy, labour and birth.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.

There is insufficient evidence to answer the question for women with previous caesarean and it was necessary to consider the results of studies with a heterogeneous population of pregnant women, some of whom had had previous caesarean.

A systematic review of 19 randomised controlled trials of more than 20,000 women that compared continuity of care with standard maternity care reported lowered intervention rates with continuity of care.\textsuperscript{135} Five of the randomised controlled trials included high-risk women (6000 women) although no individual study specifically addressed women with previous caesarean. Only one study (that did not exclude women with previous caesarean) reported a decrease in caesarean rates.\textsuperscript{136}(+) In this study, the caesarean rate in the continuity of care group was 13.3% compared with 17.8% in the standard care group (p<0.02) (OR 0.6, 95% CI 0.4-0.9).

A smaller systematic review of seven good quality randomised controlled trials with 9148 women found that continuity of care (broadly defined) was associated with lower intervention
rates and more satisfaction than standard maternity care, but rates of caesarean did not differ between the groups.\(^{137}\) The authors conceded that there was large variation within the two groups that might require cautious interpretation of their results.

Key Point

Well-designed studies of continuity of care by midwives for pregnant women has shown a decrease in intervention rates, although the reduction in caesarean was not consistent.

QUESTION 6

In pregnant women with a previous caesarean does specialist review result in improved likelihood of vaginal birth and safer outcomes compared to non-specialist care (midwifery and general practice care)?

RECOMMENDATION

All women who have had a previous caesarean must be referred for consultation with an obstetrician during the antenatal period, preferably prior to 36 weeks.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

No external evidence was identified to answer this question.

The New Zealand Guidelines for consultation with obstetric and related specialist medical services are best practice guidelines based on expert opinion and available evidence. For previous caesarean, the recommended level of referral is:

- **Level 2:** The Lead Maternity Carer must recommend to the woman or parents that a consultation with a specialist is warranted. The specialist will not automatically assume responsibility for ongoing care. This will depend on the clinical situation and the wishes of the individual woman.\(^{34}\)

The obstetrician reviewing the pregnant woman with a previous caesarean should review the indications for the previous caesarean and consider the safety of planned vaginal birth.

QUESTION 7

In pregnant women with a previous caesarean birth does epidural result in improved likelihood of vaginal birth compared to no epidural?

RECOMMENDATION

Pregnant women with previous caesarean may be offered an epidural although there is no evidence that this will improve the chance of successful vaginal birth.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.
Epidural is often used in conjunction with induction or augmentation procedures to reduce pain. Adequate pain relief may encourage a greater percentage of women to attempt VBAC but there is concern that analgesia may mask the signs and symptoms of uterine rupture. There was limited evidence to answer this question.

Two cohort studies\(^{138,139}\) specifically assessed the impact of analgesia on vaginal birth rates with data collected from 1984 to 1986 and from 1972 to 1987 respectively. They found no differences in the vaginal birth rates between women having epidural and women not having epidural. Both studies are old and did not control for confounders. The former study was underpowered to adequately assess effects and the latter did not perform statistical tests.

Other studies of variable quality\(^{140–142}\) confirm that epidural analgesia does not appear to affect the rate of vaginal birth.

**Key Point**

Limited data suggest that epidural anaesthesia during labour does not appear to increase the rate of vaginal birth for women who have previously had a caesarean.

**QUESTION 8**

In pregnant women with a previous caesarean birth does continuous EFM result in improved foetal and maternal morbidity and mortality compared to no monitoring?

**RECOMMENDATION**

The possible benefits and risks of continuous EFM should be discussed with women with previous caesarean. Abnormalities in the foetal heart rate may precede uterine rupture and specialist consultation should be sought immediately.

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

No randomised evidence was identified to answer this question in women undergoing VBAC. A Cochrane Systematic Review has demonstrated that continuous electronic heart rate monitoring for foetal assessment in both low and high risk pregnancies is associated with higher rates of caesarean and operative vaginal birth and a reduction in neonatal seizures.\(^{143}\)

No long-term benefits for the neonate were shown in either low risk or high risk pregnancies but no specific randomised controlled trials have been done in VBAC. A recent evidence report of 10 non-randomised studies of women undergoing VBAC from Agency for Healthcare Research and Quality (AHRQ) has shown that abnormalities in foetal heart rate tracings were the most common sign of uterine rupture.

A ‘roundtable discussion’ on the issue by experts indicated that there is little consensus on the issue of whether to provide routine EFM for women undergoing a planned vaginal birth.\(^{144}\) Four recent practice guidelines have recommended EFM in women...
undergoing VBAC. The Institute for Clinical Systems Improvement guideline published in 2001 recommends that either intermittent auscultation or continuous electronic foetal heart rate monitoring should be performed. The report states that ‘50 - 70% of detected uterine ruptures present with abnormal foetal heart tracings (ie, variable decelerations that evolve into late decelerations)’. The American College of Obstetricians and Gynecologists Practice Bulletin published in 1999 also suggests that EFM is useful. The Royal College of Obstetricians and Gynaecologists Guideline on the Use of Electronic Foetal Monitoring recommends that continuous EFM is required for women with previous caesarean. They based their recommendation on evidence from the Confidential Enquiry into Stillbirths and Deaths in Infancy. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists Clinical Guideline on Intrapartum Foetal Surveillance also recommends that continuous EFM is recommended where women have had a previous caesarean.

Key Point

In pregnant women with previous caesarean, there is no evidence that continuous EFM results in improved foetal and maternal morbidity and mortality compared to intermittent monitoring. EFM is associated with higher rates of caesarean and operative vaginal birth. Although EFM is associated with a reduction in neonatal seizures, no impact on cerebral palsy rates or other long-term child development outcomes has been reported. Foetal heart rate changes may be an early warning sign of uterine rupture. These should be specifically sought by the caregiver with auscultation or EFM throughout the labour.

QUESTION 9

In pregnant women with a previous caesarean birth, does a focused discussion with written material result in improved likelihood of vaginal birth compared to no focused discussion?

GOOD PRACTICE POINTS

Full and unbiased information on choosing VBAC should be discussed on a case-by-case basis with the pregnant woman with previous caesarean to enable her to make an informed decision about her birth choices.

There should be immediate access to obstetricians/paediatricians and caesarean facilities.

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.

One well-designed randomised controlled trial compared a prenatal education program of written and oral support promoting VBAC (the ‘verbal’ group) with a written pamphlet alone on the benefits of VBAC (the ‘document’ group). The study was performed in Canada, in 12 hospitals (11 Canadian and 1 USA) between 1992 and 1994. It did not find any evidence that the structured prenatal education program increased the probability of vaginal birth over simple written information. The trial did not include a ‘placebo’ group but among women who did not participate in the study, the rate of vaginal birth after a previous caesarean was 39.3% compared to a rate of 50.3% in participants in the study.
The study population was highly selective (only 19% of eligible women participated) and 71% were already highly motivated to achieve a vaginal birth at enrolment, so results may not be easily applicable to all women with a previous caesarean birth.

The results of this study were similar to other studies with different but related interventions.\textsuperscript{117,151}

Another randomised controlled trial that did not specifically assess the role of written information for women with previous caesarean birth, assessed the effect of leaflets on promoting informed choice in women using maternity services.\textsuperscript{152(x)} Maternity units in Wales were randomised to use leaflets or offer usual care in two samples of women, prior to birth and after birth. The leaflets summarised evidence on 10 decisions that women face in pregnancy and childbirth, to encourage their involvement in decisions about their care, but did not give information on VBAC. The trial report indicated that use of written leaflets did not change the proportion of women who felt that they exercised informed choice but there were possible problems with the implementation of the intervention.

Key Point

Discussion, together with written information, does not appear to change the rate of vaginal birth in women with previous caesarean birth compared to written information alone. However, it is recommended that all pregnant women with previous caesarean birth should be given full and unbiased information on the risks and benefits of choosing a planned vaginal birth.

QUESTION 10

In pregnant women with a previous caesarean birth, does pelvimetry assist in clinical decision-making about mode of birth?

\textbf{RECOMMENDATION}

\textit{X-ray pelvimetry in women with previous caesarean is not recommended.}

Grades indicate the strength of the supporting evidence, rather than the importance of the recommendations – refer to page 66 for grading details.

One randomised controlled trial of adequate quality\textsuperscript{153(\textendash)} and a few case series were identified. The results of the trial agreed with those of the case reports.

The study population in the randomised controlled trial was recruited from a hospital in South Africa with a caesarean rate of 23% in primiparous women, which is similar to the rate in New Zealand. The authors suggested that adequate pelvic size was an important factor in successful VBAC, but that clinical pelvimetry was too subjective to be of practical value. The trial assessed the effect of antepartum X-ray pelvimetry on the rate of repeat caesarean, the predictive value of X-ray pelvimetry on the outcome of a planned vaginal birth and the impact on maternal and foetal well-being during and after birth, in 306 women with previous caesarean birth. Women randomised to antepartum X-ray pelvimetry who had an inadequate pelvis were delivered by elective caesarean. Women randomised to the control group who were allocated to a trial of labour without antepartum X-ray...
pelvimetry had X-ray pelvimetry postpartum to determine the adequacy of the pelvis. Vaginal birth rates in those who had an adequate pelvis were compared with those who had an inadequate pelvis.

In the control group, a greater proportion of women with an inadequate pelvis delivered vaginally (60%) compared to those with an adequate pelvis (30%) according to X-ray pelvimetry. X-ray pelvimetry was a poor indicator of the outcome of labour with a sensitivity of 26.2%, a specificity of 45%, a positive predictive value of 40% and a negative predictive value of 30.3%.

In conclusion, the use of X-ray pelvimetry may increase the caesarean rate fourfold (OR 3.8, 95% CI 2.0 - 6.8) and is a poor predictor of successful VBAC.

QUESTION 11
In women with two previous caesarean births, does planned vaginal birth have increased perinatal and maternal morbidity/mortality compared to elective caesarean?

**RECOMMENDATION**

Pregnant women with two previous caesarean births and no additional risk factors for vaginal birth may be offered planned vaginal birth after discussing the risks and benefits.

Five cohort studies and a case series were identified and the study results are summarised in Table 5.7. Rates of successful vaginal birth ranged from 62 to 89% but were significantly lower than rates from women with only 1 previous caesarean in 3 studies. The rates of vaginal birth are obviously dependent on the proportion of eligible women who elect to attempt VBAC. In another study, only 10% of eligible women with two previous caesareans attempted VBAC compared to 90% of eligible women who had one previous caesarean. This difference helps to explain why VBAC appears to be more successful in the former group (89% versus 54%).

In contrast, the largest study (12,707 women undergoing a planned vaginal birth after caesarean) reported uterine rupture rates of 0.6% and 1.8% for women with 1 and 2 prior caesarean deliveries, respectively. Neither obstetric history nor labour management practices were controlled for in the analysis. Rates in the other studies were similar.

Foetal morbidity rates are also affected by the proportion of women attempting VBAC and also the choice of denominator for the comparison. The discrepancy in the proportions of infants who had an Apgar score lower than 7 (Table 5.8) can be explained. The Caughey study reported a 60% rate (3/5) of foetal morbidity (Apgar score < 7) in infants delivered vaginally by women with 2 previous caesarean deliveries but this rate was calculated for those women who had complete rupture, not of the entire group. By comparison, the foetal morbidity rates recorded for the Phelan study were calculated for the entire group who attempted VBAC. The hysterectomy rates in the 2 studies also had the same denominators as the Apgar scores and so they cannot be compared directly.
In conclusion, there is reasonable evidence that at least 65% of selected women with 2 previous caesareans can have a successful vaginal birth. The risks of harm for these women do not appear to be markedly increased compared to women with 1 previous caesarean.

**Table 5.7: Rupture rates and success of trial of labour in women with one previous caesarean compared to women with more than one previous caesarean**

<table>
<thead>
<tr>
<th>Study</th>
<th>Study no</th>
<th>Rupture/Dehiscence rate with &gt;1 caesarean</th>
<th>Rupture/Dehiscence rate with 1 caesarean</th>
<th>Success of VBAC with &gt;1 caesarean</th>
<th>Success of VBAC with 1 caesarean</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phelan 1989</td>
<td>1,088</td>
<td>1.8%</td>
<td>na</td>
<td>69%</td>
<td>83%</td>
<td>nr</td>
</tr>
<tr>
<td>Miller 1994</td>
<td>12,707</td>
<td>1.8%</td>
<td>0.6%</td>
<td>75%</td>
<td>83%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chattopadhy 1994</td>
<td>1,121</td>
<td>0.8%</td>
<td>0.9%</td>
<td>90%</td>
<td>54%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Asakura 1995</td>
<td>1,412</td>
<td>1.99%</td>
<td>1.1%</td>
<td>64%</td>
<td>77%</td>
<td>ns</td>
</tr>
<tr>
<td>Caughey 1999</td>
<td>3,891</td>
<td>3.7%</td>
<td>0.8%</td>
<td>62%</td>
<td>75%</td>
<td>0.001</td>
</tr>
<tr>
<td>Bretelle 2001</td>
<td>180</td>
<td>0.03%</td>
<td>na</td>
<td>na</td>
<td>65.6%</td>
<td>na</td>
</tr>
</tbody>
</table>

na = not applicable  nr = not reported  ns = not significant

**Table 5.8: Neonatal Apgar scores and hysterectomy rates associated with trial of labour for women with 1 previous caesarean and women with more than 1 previous caesarean**

<table>
<thead>
<tr>
<th>Study</th>
<th>5 min Apgar score &lt;7 (&gt;1 caesarean)</th>
<th>5 min Apgar score &lt;7 (1 caesarean)</th>
<th>Hysterectomy rate with TOL (&gt;1 caesarean)</th>
<th>Hysterectomy rate with TOL (1 caesarean)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caughey 1999</td>
<td>60%</td>
<td>9.7%</td>
<td>20%</td>
<td>22.6%</td>
<td>0.005 ns</td>
</tr>
<tr>
<td>Phelan 1989</td>
<td>2.6%</td>
<td>na</td>
<td>0.2%</td>
<td>na</td>
<td>nr</td>
</tr>
</tbody>
</table>

na = not applicable  nr = not reported  ns = not significant
THE COST OF VAGINAL BIRTH VERSUS CAESAREAN

THE COST OF CAESAREAN

The decision to perform a caesarean is not only a clinical one but also an economic one. However, there are a number of questions to consider in undertaking an economic analysis of caesarean.

- Whose perspective should be taken – the health service as a whole or the woman and her family?
- How far into the future should the costs be considered?
- Should just the birth and immediate subsequent weeks be costed or should the long-term consequences of the decisions around birth be considered?

VAGINAL BIRTH AFTER CAESAREAN

A literature search has identified several studies on this topic. The methodologies used varied between studies and as a result, the conclusions are conflicting. In particular, the assumptions used about successful outcome and rate of uterine rupture differed. All the studies compared the cost of a planned vaginal birth with the cost of elective caesarean (see Table 6.1). The long-term outcomes included were usually cerebral palsy secondary to birth asphyxia resulting from uterine rupture.

BREECH PRESENTATION

Only one economic analysis was identified that considered the costs associated with breech presentation. The question that the analysis considered was whether or not ECV with epidural anaesthesia was a cost-effective procedure after the first attempt failed with tocolysis. The conclusions were that ECV under epidural reduces the rate of caesarean associated with breech presentation but its relative safety remains in question. The costs were increased in the group with ECV under epidural when compared with expectant management but no comparison was made with routine elective caesarean as this trial preceded the publication of the term breech trial.
<table>
<thead>
<tr>
<th>Author/country/methodology</th>
<th>Rate of vaginal birth after TOL assumed</th>
<th>Rate of uterine rupture assumed</th>
<th>Short and long-term consequences included?</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mushinski 1998 US Insurance data</td>
<td>Not given</td>
<td>Not given</td>
<td>No</td>
<td>The average charge for caesarean $11,450 compared to $7730 for VBAC</td>
</tr>
<tr>
<td>Clark 2000 US Modelling data</td>
<td>50 - 70%</td>
<td>0.65%</td>
<td>Yes</td>
<td>The total cost saving per TOL was relatively small even using the most optimistic assumptions ($149)</td>
</tr>
<tr>
<td>Shorten 1998 Australia Retrospective analysis of patient records</td>
<td>80%</td>
<td>Not given</td>
<td>No, but admissions to special-care baby unit were included</td>
<td>The average cost of TOL is 30% lower than the average cost of elective caesarean</td>
</tr>
<tr>
<td>Chung 2001 US Modelling data with decision tree</td>
<td>65 - 74%, above 74%</td>
<td>0.047 - 1.9%</td>
<td>Yes using quality adjusted life years</td>
<td>Suggested that a TOL was cost effective if the probability of successful vaginal birth was greater than 74%</td>
</tr>
<tr>
<td>Grobman 2000 US Markov model</td>
<td>75% (65% - 85%)</td>
<td>0.5%</td>
<td>Yes</td>
<td>For every 5 neonatal lives saved, suggested that one maternal mortality occurs. The avoidance of one major adverse neonatal outcome required more than $1 million and at least 806 additional caesarean deliveries</td>
</tr>
<tr>
<td>November 2001 US Literature review only</td>
<td></td>
<td></td>
<td></td>
<td>A VBAC program will be cost-effective only in select women with a previous scar who had a high likelihood of success. The greatest expenses remain with women who experience adverse outcomes more frequently associated with a failed TOL</td>
</tr>
<tr>
<td>DiMaio 2002 US Retrospective analysis</td>
<td>75%</td>
<td>2.2%</td>
<td>Short-term only (up to 1 year)</td>
<td>In women with a single prior caesarean birth, a planned vaginal birth is more cost-effective than an elective repeat caesarean birth (difference was $5949 versus $4863, p=0.001)</td>
</tr>
</tbody>
</table>
THE COST OF ELECTIVE CAESAREAN FOR NO MEDICAL INDICATION

No cost analysis of this scenario was found. In order to cost elective caesarean with no medical indications, it is necessary to estimate the costs involved in planned vaginal birth with all the possible outcomes (including spontaneous vaginal birth, operative vaginal birth and emergency caesarean) and compare this with elective caesarean.

An economic analysis of alternative modes of birth during the first two months postpartum was identified. The costs of three modes of birth were compared. Spontaneous vaginal birth was costed as £1698, instrumental vaginal birth £2262 and caesarean £3200. The long-term outcomes were not included in this cost analysis. Elective caesarean was not specifically costed and, as some complications may be fewer in this group, it is not possible to extrapolate from caesarean as a whole.

A systematic review of economic aspects of alternative modes of birth identified 49 studies that reported costs. Data from the better quality studies demonstrated that caesarean costs a health service substantially more than other modes of birth. The range of costs of an uncomplicated vaginal birth was £629 - £1298 compared with £1238 - £3551 for a caesarean. All of the papers only considered short-term health care costs.

NEW ZEALAND COSTS

No published data are available on the costs of the options of elective caesarean, emergency caesarean and vaginal delivery. However, information from the NZ Health Information Service using the National Minimum Dataset (NMDS) public hospital data on length of stay and cost of caesarean versus vaginal delivery was available (personal communication). In 2000 - 2001, the cost of caesarean was $3701 while the cost of vaginal delivery was $1731. The mean length of stay was 5.2 days for caesarean and 2.35 for vaginal births. These data are not very useful as they do not take into account the number of planned vaginal deliveries that require emergency caesarean. Furthermore, the neonatal costs are not taken into consideration.
PERFORMANCE INDICATORS FOR CAESAREAN

Performance indicators can be used to monitor the success of the guideline and the implementation phase. DHBs, hospitals and individual’s practice could be monitored this way. The performance indicators were developed after a literature search. Two documents, The National Sentinel Caesarean Section Audit and Guide to Inpatient Quality Indicators, were identified. The group undertook an internal process incorporating the information above and developed the list of performance indicators as listed below. They will require piloting and evaluation prior to being incorporated into a national process.

The following performance indicators are suggested:

ALL BIRTHS

- Number of caesarean births/total number of births

BREECH PRESENTATION

- Number of women who have vaginal breech birth/total number of breech births
- Number of women with singleton breech presentation from 37 weeks who undergo ECV/total number of women with singleton breech presentation from 37 weeks
- Number of women who have ‘successful’ ECV procedures (as defined by conversion of breech to cephalic presentation)/total number of women undergoing ECV procedures
VAGINAL BIRTH AFTER CAESAREAN

Only in singleton, cephalic, term presentation:

- number of women undergoing a pre-labour caesarean (ie, not labouring spontaneously nor being induced)/total number of women delivering
- number of women with previous caesarean who deliver vaginally/total number of women who deliver with previous caesarean.

Other suggestions include reporting the rates of:

- admission to neonatal intensive care unit after elective caesarean
- intrapartum and early neonatal death in normally formed infants
- grade 2 and 3 Hypoxic Ischaemic Encephalopathy
- maternal transfusion of 3 units or more
- maternal admission to intensive care unit
- uterine rupture (not including dehiscence/‘windows’)
- peripartum hysterectomy
- babies born with an Apgar score of ≤4 at 5 minutes after birth (expressed as a percentage)
- admission to a neonatal unit after elective caesarean.

The denominator would be the total number of births or mothers.
DISSEMINATION AND IMPLEMENTATION

DISSEMINATION

- Speakers from the guideline team to address conferences and meetings of obstetricians/midwives and general practitioners
- Promotion of the guideline recommendations to DHB managers to promote establishment of breech and VBAC clinics
- Promotion of the information on risks/benefits and alternatives to caesarean in women’s and family-focused magazines and newspapers
- Inclusion of information in the booklets that pregnant women are given by the Ministry of Health

IMPLEMENTATION

The role of implementation in guideline development cannot be over emphasised.

The following implementation strategies are suggested:

Breech Presentation

1. The information contained in the guideline needs to be presented to maternity care providers and pregnant women who are involved in decision-making about management. In addition to the dissemination of the guideline, training in external cephalic version and vaginal breech birth will be necessary.

2. Hospitals that provide maternity care should establish dedicated breech clinics where women with breech presentation from 36 weeks can be seen for ECV.
Vaginal Birth after Caesarean

1. The information contained in the guideline needs to be presented to maternity care providers and pregnant women who are involved in decision-making about management of labour following caesarean.

2. Hospitals that provide maternity care should consider establishing a clinic staffed by midwives and obstetricians who are committed to the recommendations in the Guideline for women who have had a previous caesarean. The Lead Maternity Carer could potentially attend the specialist consultation in order to maintain continuity. The aim of the clinic would be to provide information on the benefits and risks of the options available to them of repeat caesarean and planned vaginal birth.

Monitor the adherence to the performance indicators in DHB audit programmes.
EVALUATION

To assess whether guidelines improve practice, evaluation of the effectiveness of the implementation strategy is important. It is recommended that an appropriate strategy be designed to thoroughly evaluate the impact of the guideline at a reasonable interval after publication. Evaluation ensures that the process of care reflects the evidence-based guideline recommendations that are designed to improve birth outcomes for all women.

Issues to be considered as part of the audit process are:

- identification of the number of health care practitioners (midwives, general practitioners and obstetricians) that are aware of the guideline recommendations
- identification of the coverage of the consumer information and whether it is routinely made available to pregnant women considering a caesarean
- comparative measurement of health outcomes for mothers and infants, in particular:
  - caesarean rates
  - maternal/foetal morbidity and mortality
  - women’s satisfaction.

In addition to measuring the impact of the guideline on health outcomes, evaluation processes need to be designed to assess the effects on changing attitudes or behaviour and reducing practice variation throughout New Zealand.
APPENDIX
EVIDENCE AND RECOMMENDATION
GRADING SYSTEM

DETAILS OF GRADING SYSTEM

Studies were graded using a two-tier system that is detailed in the Handbook for the Preparation of Explicit Evidence-Based Clinical Practice Guidelines, published in November 2001 by NZGG. This system has been adapted from other grading systems currently in use, in particular the SIGN system.

The searches concentrated on finding high grade evidence to answer the identified clinical questions, such as systematic reviews, randomised controlled trials and, where these were not available, observational studies such as well-designed cohort and case control studies. Only these types of study design were graded. Where these types of studies were not available, less rigorous study designs such as cross sectional studies and case studies were considered but were not formally graded.

The two-tier system follows this process:

- Critical appraisal of individual relevant studies (identified from the searching) and assigning of a level of evidence for the first section of the GATEFRAME checklist that is incorporated into the evidence tables. A random sample of appraisals in the guideline were performed independently by two assessors and the results compared.
- Joint consensus by the development team on the issues of volume, consistency, clinical relevance and applicability of the body of evidence in the evidence table (filling out the NZGG Considered Judgment form for each clinical question) and development of graded recommendations that attempt to answer the clinical questions posed.

LEVELS OF EVIDENCE

There are three levels of evidence that can be assigned to the Validity section of the GATEFRAME (Section 1):

+ strong study where all or most of the validity criteria are met

~ fair study where not all the validity criteria are met, but the results of the study are not likely to be influenced by bias

× weak study where very few of the validity criteria are met and there is a high risk of bias.
DEVELOPING RECOMMENDATIONS

Recommendations were formulated by joint meetings of the multidisciplinary Guideline Development Team. The group considered the entire body of evidence (summarised in the evidence tables) and filled out Considered Judgment forms for each clinical question that was identified as being relevant to the guideline (see www.nzgg.org.nz). The following aspects were discussed: volume of evidence, applicability to the New Zealand setting, consistency and clinical impact, with the aim of achieving consensus. Consensus was sought and achieved over the wording of the recommendation and grading.

In this guideline, where a recommendation is based on the clinical experience of members of the Guideline Development Team, this is referred to as a good practice point.

GRADING OF RECOMMENDATIONS

**RECOMMENDATIONS**

- **A** The recommendation is supported by good evidence (where there is a number of studies that are valid, consistent, applicable and clinically relevant).
- **B** The recommendation is supported by fair evidence (based on studies that are valid, but there are some concerns about the volume, consistency, applicability and clinical relevance of the evidence that may cause some uncertainty but are not likely to be overturned by other evidence).
- **C** The recommendation is supported by international expert opinion.
- **I** No recommendation can be made because the evidence is insufficient (either evidence is lacking, of poor quality, conflicting or the balance of benefits and harms cannot be determined).

Grades indicate the strength of the supporting evidence rather than the importance of the recommendations.

**GOOD PRACTICE POINT**

Where no evidence is available, best practice recommendations are made based on the experience of the Guideline Development Team.
## ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
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<tr>
<td>COH</td>
<td>Cohort study</td>
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<tr>
<td>CPD</td>
<td>Cephalopelvic disproportion</td>
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<tr>
<td>CS</td>
<td>Caesarean</td>
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<tr>
<td>CTG</td>
<td>Cardiotocograph</td>
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<tr>
<td>DA</td>
<td>Decision analysis</td>
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<tr>
<td>DHB</td>
<td>District Health Board</td>
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<tr>
<td>ECV</td>
<td>External cephalic version</td>
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<tr>
<td>EFM</td>
<td>Electronic foetal monitoring</td>
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<tr>
<td>FHR</td>
<td>Foetal heart rate</td>
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<tr>
<td>GL</td>
<td>Guideline</td>
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<tr>
<td>IOL</td>
<td>Induction of labour</td>
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<tr>
<td>LMC</td>
<td>Lead Maternity Carer</td>
</tr>
<tr>
<td>MSV</td>
<td>Mauriceau-Smellie-Veit</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MRI</td>
<td>Magnetic resonance imaging</td>
</tr>
<tr>
<td>NICU</td>
<td>Neonatal intensive care unit</td>
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<tr>
<td>NNT</td>
<td>Number needed to treat</td>
</tr>
<tr>
<td>NWH</td>
<td>National Women’s Hospital</td>
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<tr>
<td>NZGG</td>
<td>New Zealand Guidelines Group</td>
</tr>
<tr>
<td>OR</td>
<td>Odds ratio</td>
</tr>
<tr>
<td>PNM</td>
<td>Perinatal mortality rate</td>
</tr>
<tr>
<td>PRN</td>
<td>Pro re nata (Latin) – When required.</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised controlled trial</td>
</tr>
<tr>
<td>REV</td>
<td>Narrative or unsystematic review</td>
</tr>
<tr>
<td>RR</td>
<td>Relative risk</td>
</tr>
<tr>
<td>SCBU</td>
<td>Special care baby unit</td>
</tr>
<tr>
<td>SR</td>
<td>Systematic review</td>
</tr>
<tr>
<td>VBAC</td>
<td>Vaginal birth after caesarean</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</tbody>
</table>
### GLOSSARY

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auscultation</td>
<td>Listening for heart rate sounds, often with a stethoscope.</td>
</tr>
<tr>
<td>Bradycardia</td>
<td>Slow heart beat (usually less than 60 beats per minute).</td>
</tr>
<tr>
<td>Breech</td>
<td>Position of foetus prior to and during birth with buttocks presenting down in pelvic outlet.</td>
</tr>
<tr>
<td>Cardiotocograph</td>
<td>Instrument used to monitor foetal heart rate and uterine contractions during delivery.</td>
</tr>
<tr>
<td>Cephalic</td>
<td>Position of foetus prior to and during birth with head presenting down in pelvic outlet.</td>
</tr>
<tr>
<td>Cephalopelvic disproportion</td>
<td>The foetal head is assessed as being too large for the maternal pelvis.</td>
</tr>
<tr>
<td>Cohort study</td>
<td>An observational study that takes a group (cohort) of patients and follows their progress over time in order to measure outcomes and make comparisons according to the treatments or interventions that patients received.</td>
</tr>
<tr>
<td>Confidence Interval (CI)</td>
<td>Usually reported as a 95% CI which is the range of values within which we can be 95% sure that the true value of the population lies [eg, for an NNT of 10 with a 95% CI of 5 to 15, we would have 95% confidence that the true NNT value (that we are trying to estimate) lies between 5 and 15].</td>
</tr>
<tr>
<td>Decision analysis</td>
<td>A systematic way of reaching decisions based on evidence from research. This evidence is translated into probabilities.</td>
</tr>
<tr>
<td>Direct deaths</td>
<td>Deaths resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium) from interventions, omissions, incorrect treatment or from a chain of events resulting from any of the above (as compared to indirect which means deaths resulting from pre-existing disease etc).</td>
</tr>
<tr>
<td>Dystocia</td>
<td>Abnormal labour or birth situation due to shape, size, position or condition of baby or mother.</td>
</tr>
<tr>
<td>External cephalic version</td>
<td>Pressure applied to the abdomen of the pregnant woman with breech presentation to change the presentation to head first.</td>
</tr>
<tr>
<td><strong>Guideline</strong></td>
<td>A systematically developed tool which describes aspects of a patient’s condition and the care to be given.</td>
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<tr>
<td><strong>Hapu:</strong></td>
<td>Groups of whānau with common ancestral links; sub-tribe.</td>
</tr>
<tr>
<td><strong>Hypoxia:</strong></td>
<td>Lack of oxygen.</td>
</tr>
<tr>
<td><strong>Iwi:</strong></td>
<td>Tribe.</td>
</tr>
<tr>
<td><strong>Multiparous:</strong></td>
<td>One or more previous births.</td>
</tr>
<tr>
<td><strong>Nuchal:</strong></td>
<td>Entrapment behind the head.</td>
</tr>
<tr>
<td><strong>Nulliparous:</strong></td>
<td>No previous births.</td>
</tr>
<tr>
<td><strong>Number needed to treat (NNT):</strong></td>
<td>This measures the impact of a treatment or intervention. It states how many people need to be treated with the treatment in question in order to prevent an event which would otherwise occur.</td>
</tr>
<tr>
<td><strong>Perinatal mortality rate:</strong></td>
<td>Mortality rate in the perinatal period, from 20th or 28th week of gestation to twenty-eight days after birth.</td>
</tr>
<tr>
<td><strong>Placenta Accreta:</strong></td>
<td>Abnormal adherence of part or all of the placenta to the uterine wall.</td>
</tr>
<tr>
<td><strong>Placenta Previa:</strong></td>
<td>Obstetric complication in which the maturing placenta partially or completely obstructs the cervical os. It is a major cause of bleeding prior to birth.</td>
</tr>
<tr>
<td><strong>Primipara/ous:</strong></td>
<td>Woman with one previous birth.</td>
</tr>
<tr>
<td><strong>Tocolysis:</strong></td>
<td>Use of drug medication to relax the uterus.</td>
</tr>
<tr>
<td><strong>Whānau:</strong></td>
<td>Relationship with blood links to a common ancestor; family.</td>
</tr>
</tbody>
</table>
REFERENCES


146. ACOG. Vaginal birth after previous cesarean delivery. ACOG Practice Bulletin 1999;5.


Care of Women with 
Breech Presentation or 
Previous Caesarean Birth