Intrapartum care for women with existing medical conditions or obstetric complications and their babies

[S] Evidence review for previous caesarean section

NICE guideline NG121

Evidence reviews for women at high risk of adverse outcomes for themselves and/or their baby because of obstetric complications or other reasons

March 2019

Developed by the National Guideline Alliance hosted by the Royal College of Obstetricians and Gynaecologists
Disclaimer

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Intrapartum care for women with previous caesarean section – management of the first and second stages of labour ...................................................... 142

Appendix I – Economic evidence tables .......................................................... 142

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour ...................................................... 142

Appendix J – Health economic evidence profiles .............................................. 142

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour ...................................................... 142

Appendix K – Health economic analysis .......................................................... 142

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour ...................................................... 142

Appendix L – Research recommendations ......................................................... 142

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour ...................................................... 142
Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

Review question

How should the first and second stages of labour be managed for women with a previous caesarean section?

Introduction

The aim of this review is to determine how the first and second stages of labour should be managed for women with previous caesarean section. The committee was aware of the NICE guideline on caesarean section (CG132), which includes recommendations about planning mode of birth after a previous caesarean section. This review focuses on management of the first and second stages of labour for women with a previous caesarean section who have planned a vaginal birth after caesarean section (VBAC) in preference to a repeat caesarean section.

Summary of the protocol

See Table 1 for a summary of the population, intervention, comparison and outcome (PICO) characteristics of this review.

Table 1: Summary of the protocol (PICO table)

<table>
<thead>
<tr>
<th>Population</th>
<th>Women in the first or second stage of labour with 1 or more previous caesarean sections</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td></td>
</tr>
<tr>
<td>Intervention 1</td>
<td>Routine insertion of IV cannula</td>
</tr>
<tr>
<td>Intervention 2</td>
<td>Oxytocin in the case of suspected or confirmed delay in labour</td>
</tr>
<tr>
<td>Intervention 3</td>
<td>Emergency caesarean section</td>
</tr>
<tr>
<td>Intervention 4</td>
<td>Labour or birth in a birth pool</td>
</tr>
<tr>
<td>Intervention 5</td>
<td>Neuraxial analgesia</td>
</tr>
<tr>
<td>Intervention 6</td>
<td>Amniotomy</td>
</tr>
<tr>
<td>Intervention 7</td>
<td>Fasting</td>
</tr>
</tbody>
</table>
**Intervention 8**
Antacid prophylaxis (ranitidine, omeprazole or sodium citrate)

**Intervention 9**
Limited mobility (supine, or restricted to the bed)

**Intervention 10**
Use of scoring systems (for example, VBAC or TOLAC)

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No IV cannula</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No oxytocin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Continuation of labour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Labour or birth without birth pool</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No neuraxial analgesia (including pharmacological analgesia)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 6:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No amniotomy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Not fasting</td>
</tr>
<tr>
<td></td>
<td>• Clear fluids only</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No antacid prophylaxis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unlimited mobility (upright positions, or mobile)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Comparison 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No use of scoring systems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>For the woman:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• major morbidities:</td>
</tr>
<tr>
<td></td>
<td>o uterine rupture or dehiscence</td>
</tr>
<tr>
<td></td>
<td>o major blood loss (&gt;1000 ml)</td>
</tr>
<tr>
<td></td>
<td>o infectious morbidity</td>
</tr>
<tr>
<td></td>
<td>o placenta praevia and/or accreta in future pregnancies or pelvic adhesions complicating any future abdominopelvic surgery</td>
</tr>
<tr>
<td></td>
<td>o hysterectomy</td>
</tr>
<tr>
<td></td>
<td>• women's experience of labour and birth, including experience of the birth companion, separation of the woman and baby and breastfeeding initiation</td>
</tr>
<tr>
<td></td>
<td>• mortality</td>
</tr>
</tbody>
</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section
March 2019

- emergency caesarean section or operative vaginal birth for all comparisons except comparison 3
- admission to HDU or ITU and duration of hospital stay

For the baby:
- major morbidities (respiratory and HIE)
- mortality from any cause

HDU: high dependency unit; HIE: hypoxic ischaemic encephalopathy; ITU: intensive therapy unit; IV: intravenous; VBAC: vaginal birth after previous caesarean section; TOLAC: trial of labour after previous caesarean section

For further details see the full review protocol in Appendix A – Review protocol. The search strategies are presented in Appendix B – Literature search strategies.

Clinical evidence

Included studies

Eight prospective and 19 retrospective cohort studies were included in this review (see ‘Summary of clinical studies included in the evidence review’).


There was no evidence identified for the following comparisons: routine insertion of an intravenous (IV) cannula versus no IV cannula; labour or birth in a birth pool versus labour or birth without a birth pool; amniotomy versus no amniotomy; fasting versus no fasting or consuming only clear fluids; antacid prophylaxis (ranitidine, omeprazole or sodium citrate) versus no antacid prophylaxis; limited mobility (supine position or restricted to the bed) versus unlimited mobility (upright positions or mobile); and use of scoring systems versus no use of scoring systems.

Evidence from the studies included in the review is summarised below (see ‘Quality assessment of clinical studies included in the evidence review’).

Data was reported on the critical outcomes, uterine rupture or dehiscence, placenta praevia in future pregnancies, hysterectomy, hypoxic ischaemic encephalopathy (HIE), and the important outcomes, maternal and neonatal mortality, emergency caesarean section, operative vaginal birth, and the outcome of limited importance, admission to HDU or ITU and duration of hospital stay. There was no evidence identified for the following maternal outcomes: pelvic adhesions complicating any future abdominopelvic surgery (critical outcome) and woman’s experience of labour and birth, including experience of her birth companion (s), separation of the woman and baby and breastfeeding initiation (critical outcome), and the following neonatal outcome: major respiratory morbidity. In relation to major blood loss, only evidence on proxy (indirect) outcomes (postpartum haemorrhage and blood transfusion) was identified. In relation to maternal infectious morbidity (critical outcome), evidence on
the following outcomes was identified: febrile morbidity, febrile morbidity requiring antibiotics, endometritis, chorioamnionitis, postpartum fever, urinary tract infection, and wound infection). In relation to HIE (critical outcome), evidence on an additional proxy outcome (birth asphyxia) was identified. In relation to admission to HDU or ITU and duration of hospital stay (outcome of limited importance), evidence on an additional proxy outcome (duration of intrapartum and postpartum stay) was identified.

See also the study selection flow chart in Appendix C – Clinical evidence study selection.

Excluded studies

Studies not included in this review with reasons for their exclusion are listed in Appendix D – Excluded studies.

Summary of clinical studies included in the evidence review

Table 2 provides a brief summary of the included studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chelmow 1992</td>
<td>N=504 women with previous CS who attempted TOLAC; n=62 labours augmented with oxytocin, n=442 not augmented with oxytocin</td>
<td>Oxytocin versus no oxytocin for augmentation of labour</td>
<td>For the woman: • uterine rupture • hysterectomy • mortality • emergency CS • operative vaginal birth • febrile morbidity • duration of intrapartum and postpartum stay</td>
<td>In the oxytocin group, n=31/46 (67%) of women who gave birth vaginally had a spontaneous VB and n=15/46 (33%) had an assisted VB; In the no oxytocin group, n=194/245 (79%) of women who gave birth vaginally had a spontaneous VB and n=51/245 (21%) had an assisted VB</td>
</tr>
<tr>
<td>Kwee 2007</td>
<td>N=2592 women with previous CS who attempted TOLAC; n=536 labours augmented with oxytocin, n=2056 not augmented with oxytocin</td>
<td>Oxytocin versus no oxytocin for augmentation of labour</td>
<td>For the woman: • uterine rupture</td>
<td>Labour induction with oxytocin, prostaglandins, combination of the two, sulproston, misoprostol, or other means in n=682/3274 (20.8%) of women undergoing TOLAC. Labour augmentation</td>
</tr>
</tbody>
</table>
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>with oxytocin in n=536/3274 (16.4%) of women undergoing TOLAC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Of those attempting TOLAC 92% had 1 previous CS followed by 1 previous VB, and 73% had 1 previous VB followed by 1 previous CS</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td><strong>Emergency caesarean section versus continuation of labour</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Baker 1955 Retrospective cohort UK</td>
<td>N=83 women with previous CS who attempted TOLAC; n=74 achieved VB, n=9 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: placenta praevia as an indication for primary CS mortality</td>
<td>Of those who achieved VB n=47/74 (64%) had a spontaneous VB and n=27/74 (36%) had an assisted VB</td>
</tr>
<tr>
<td>Brock 2016 Prospective cohort USA</td>
<td>N=5727 women with previous CS who attempted TOLAC; n=5640 achieved VB, n=87 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: uterine rupture or dehiscence endometritis hysterectomy For the baby: perinatal mortality hypoxic ischaemic encephalopathy</td>
<td>All women had spontaneous labour. Previous VB: n=3413 (61%) in VB group, n=17 (19.5%) in emergency CS group</td>
</tr>
<tr>
<td>Dhall 1987 Retrospective cohort India</td>
<td>N=590 women with previous CS who attempted TOLAC; n=452 achieved VB, n=138 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the baby: perinatal mortality</td>
<td>Labour induction with pitocin in n=59/132 (44.7%) in VB group; n=248/590 (42%) had a previous VB and n=342/590 (58%) did not have a previous VB</td>
</tr>
<tr>
<td>Durnwald 2004 Retrospective cohort</td>
<td>N=522 women with previous CS who attempted TOLAC; n=344 achieved VB,</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: postpartum haemorrhage endometritis chorioamnionitis postpartum fever</td>
<td>Oxytocin use: n=171/344 (49.7%) in VB group, n=126/178 (70.8%) in emergency CS group</td>
</tr>
</tbody>
</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>n=178 had emergency CS</td>
<td></td>
<td>• mortality</td>
<td>Spontaneous labour: n=293/344 (85%) in VB group, n=136/178 (76%) in emergency CS group</td>
</tr>
<tr>
<td>Eglinton 1984</td>
<td>N=308 women with previous CS who attempted TOLAC; n=240 achieved VB, n=68 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: • dehiscence • febrile morbidity • hysterectomy • hospital stay</td>
<td>Indications for use of oxytocin were the same as for women with an unscarred uterus (no further details reported)</td>
</tr>
<tr>
<td>USA</td>
<td>N=230 women with previous CS who attempted TOLAC; n=181 achieved VB, n=49 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: • uterine rupture • febrile morbidity • blood transfusion • mortality • hospital stay</td>
<td>Labour induction or augmentation with pitocin in n=94/230 (41%)</td>
</tr>
<tr>
<td>Gupta 2014</td>
<td>N=128 women with previous CS who attempted TOLAC; n=76 achieved VB, n=52 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the baby: • perinatal mortality • birth asphyxia</td>
<td>Oxytocin was used to accelerate labour in a few women (no further details reported).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Of those who achieved VB n=40/76 (53%) gave birth without augmentation of labour</td>
</tr>
<tr>
<td>Hadley 1986</td>
<td>N=40 women with previous CS who attempted TOLAC; n=32 achieved VB, n=8 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: • uterine rupture • fever during labour • endometritis • urinary tract infection • wound infection • hysterectomy • mortality • hospital stay</td>
<td>Oxytocin use: n=4/32 (12.5%) in VB group, n=4/8 (50%) in emergency CS group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Of those who achieved VB n=23/32 (72%) had spontaneous labour, n=9/32 (28%) had an assisted VB</td>
</tr>
</tbody>
</table>
## Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Evidence review for previous caesarean section

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hehir 2017</td>
<td>N=2222 women with previous CS who attempted TOLAC; n=1611 achieved VB, n=611 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: • postpartum haemorrhage • hysterectomy • mortality</td>
<td>All women had spontaneous labour and 1 previous CS</td>
</tr>
<tr>
<td>Jarrell 1985</td>
<td>N=216 women with previous CS who attempted TOLAC; n=142 achieved VB, n=74 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: • febrile morbidity requiring antibiotics • wound infection • urinary tract infection • hospital stay</td>
<td>No oxytocin was given to those attempting TOLAC. Previous VB: n=33/142 (23%) in VB group, n=10/74 (14%) in emergency CS group</td>
</tr>
<tr>
<td>Kishor 1986</td>
<td>N=685 women with previous CS who attempted TOLAC; n=473 achieved VB, n=212 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the baby: • stillbirth</td>
<td>Labour induction or augmentation with pitocin in n=144/685 (21%). Spontaneous labour: n=395/473 (84%) in VB group, n=31/212 (15%) in emergency CS group. One previous CS and &gt;=1 previous VB: n=120/473 (25%) in VB group, n=42/212 (20%) in emergency CS group</td>
</tr>
<tr>
<td>Kwee 2007</td>
<td>N=3274 women with previous CS who attempted TOLAC; n=2487 achieved VB, n=787 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: • uterine rupture • dehiscence</td>
<td>Labour induction with oxytocin, prostaglandins, combination of the two, sulproston, misoprostol, or other means in n=682/3274 (20.8%) of women undergoing TOLAC.</td>
</tr>
</tbody>
</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lai 1993</td>
<td>N=99 women with previous CS who attempted TOLAC; n=64 achieved VB, n=35 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman:</td>
<td>Labour augmentation with oxytocin in n=536/3274 (16.4%) of women undergoing TOLAC. Of those attempting TOLAC 92% had 1 previous CS followed by 1 previous VB, and 73% had 1 previous VB followed by 1 previous CS</td>
</tr>
<tr>
<td>Retrospective cohort</td>
<td>Singapore</td>
<td></td>
<td>For the woman:</td>
<td>Previous VB: n=33/64 (52%) in VB group, n=7/35 (20%) in emergency CS group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For the baby:</td>
<td>Spontaneous and not augmented labour: n=38/64 (59%) in VB group, n=28/35 (80%) in emergency CS group. Spontaneous and augmented labour: n=17/64 (27%) in VB group, n=5/35 (9%) in emergency CS group</td>
</tr>
<tr>
<td>Meehan 1989</td>
<td>N=844 women with previous CS who attempted TOLAC; n=702 achieved VB, n=142 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the baby:</td>
<td>Pitocin induction or augmentation was given to 34/175 (19%)</td>
</tr>
<tr>
<td>Retrospective cohort</td>
<td>Ireland</td>
<td></td>
<td>For the woman:</td>
<td>n=285/844 (34%) women attempting TOLAC had labour induced and the other 559/844 (66%) experienced spontaneous onset of labour</td>
</tr>
<tr>
<td>Meier 1982</td>
<td>N=207 women with previous CS who</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman:</td>
<td>Pitocin induction or augmentation was given to 34/175 (19%)</td>
</tr>
</tbody>
</table>
# Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section

March 2019

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrospective cohort USA</td>
<td>attempted TOLAC; n=175 achieved VB, n=32 had emergency CS</td>
<td></td>
<td>For the baby:</td>
<td>women in the VB group</td>
</tr>
<tr>
<td>Miller 1992 Prospective cohort Australia</td>
<td>N=125 women with previous CS who attempted TOLAC; n=80 achieved VB, n=45 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman:</td>
<td>n=88/125 (64%) women attempting TOLAC received oxytocin in labour</td>
</tr>
<tr>
<td>Morewood 1973 Retrospective cohort Jamaica</td>
<td>N=243 women with previous CS who attempted TOLAC; n=171 achieved VB, n=72 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman:</td>
<td>In women not in established labour 6 to 12 hours after operative amniotomy, carefully titrated intravenous oxytocin was administered (no further details reported)</td>
</tr>
<tr>
<td>Paul 1985 Prospective cohort USA</td>
<td>N=751 women with previous CS who attempted TOLAC; n=614 achieved VB, n=137 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman:</td>
<td>Oxytocin was administered to n=289 (38%) of those attempting TOLAC (of those n=32 underwent indicated induction of labour and n=257 received oxytocin augmentation to achieve adequate uterine activity)</td>
</tr>
<tr>
<td>Phelan 1987 Prospective cohort USA</td>
<td>N=1796 women with previous CS who attempted TOLAC; n=1465 achieved VB, n=331 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman:</td>
<td>Oxytocin use: induction n=59/1796 (3%) and augmentation n=734/1796 (41%) of those attempting TOLAC</td>
</tr>
<tr>
<td>Raynor 1993 Retrospective cohort</td>
<td>N=51 women with previous CS who</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman:</td>
<td>49% of women received oxytocin (no details given).</td>
</tr>
</tbody>
</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Evidence review for previous caesarean section

**March 2019**

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>attempted TOLAC; n=31 achieved VB, n=20 had emergency CS</td>
<td></td>
<td></td>
<td>n=3 had a previous VB after CS (no further details reported)</td>
</tr>
<tr>
<td>Rietveld 2015</td>
<td>N=5246 women with previous CS who attempted operative TOLAC; n=5027 achieved operative VB, n=219 had emergency CS</td>
<td>Emergency CS versus (operative) continuation of labour</td>
<td>For the woman: • uterine rupture • postpartum haemorrhage</td>
<td>All women had 1 previous CS only. Induction of labour in women with attempted operative VB was 48.2%</td>
</tr>
<tr>
<td>Stovall 1987</td>
<td>N=272 women with previous CS who attempted TOLAC; n=216 achieved VB, n=56 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: • uterine rupture • mortality</td>
<td>Oxytocin use: n=98/216 (45%) in VB group, n=35/56 (62%) in CS group</td>
</tr>
<tr>
<td>Yetman 1989</td>
<td>N=224 women with previous CS who attempted TOLAC; n=137 achieved VB, n=87 had emergency CS</td>
<td>Emergency CS versus continuation of labour</td>
<td>For the woman: • haemorrhage</td>
<td>-</td>
</tr>
</tbody>
</table>

**Neuraxial analgesia versus no neuraxial analgesia**

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Carlsson 1980</td>
<td>N=119 women with previous CS who attempted TOLAC; n=77 extradural analgesia, n=42 no extradural analgesia</td>
<td>Extradural block versus no extradural block</td>
<td>For the woman: • dehiscence • emergency CS • operative vaginal birth</td>
<td>Oxytocin use: extradural analgesia group n=59 (77%); of these, labour was induced in n=25 and in n=34 spontaneous labour was accelerated; no extradural analgesia group n=17 (40%); of these, labour was induced in n=4 and n=13</td>
</tr>
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</table>
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

**Evidence review for previous caesarean section**

**March 2019**

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
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</table>
| Grisaru-Granovsky 2017 | N=7149 women with previous CS who attempted TOLAC; n=4081 epidural, n=3068 no epidural | Neuraxial analgesia versus no neuraxial analgesia | For the woman:  
- uterine rupture  
- dehiscence  
- emergency CS  
- operative vaginal birth  
- postpartum haemorrhage  
- durations of hospital stay (>3 days for VB, >4 days for CS) | Labour induction: epidural group = 272 (6%), no epidural group = 99 (3.2%)  
Oxytocin use: epidural group = 1018 (24.9%), no epidural group = 268 (8.7%)  
Previous VB: epidural group = 2652/4081 (65%), no epidural group = 2542/3068 (83%).  
Spontaneous VB: n=3246/4081 (80%) in epidural group, n=2622/3068 (86%) in no epidural group |
| Sakala 1990 | N=237 women with previous CS who attempted TOLAC; n=87 epidural, n=150 no epidural | Neuraxial analgesia versus no neuraxial analgesia | For the woman:  
- uterine rupture  
- blood transfusion  
- dehiscence  
- emergency CS  
- operative vaginal birth  
- endometritis | n=46 out of n=150 epidural group received no labour analgesia and n=104 received narcotic-sedative combinations (no further details reported).  
Of those who received epidural analgesia and oxytocin n=18/40 (45%) had a spontaneous VB and with no |
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

## Evidence review for previous caesarean section

March 2019

### Study

<table>
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<tr>
<th>Population</th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>oxytocin n=30/46 (65%) had a spontaneous VB. Of those who did not receive epidural analgesia but received oxytocin n=13/31 (42%) had a spontaneous VB and with no oxytocin n=82/118 (69%) had a spontaneous VB</td>
<td></td>
</tr>
</tbody>
</table>

**CS:** caesarean section; **TOLAC:** trial of labour after previous caesarean section; **VB:** vaginal birth

See also the study evidence tables in Appendix E – Clinical evidence tables. No meta-analysis was undertaken for this review (and so there are no forest plots in Appendix F – Forest plots).

### Quality assessment of clinical studies included in the evidence review

The clinical evidence profiles for this review question are presented in Appendix G – GRADE tables.

### Economic evidence

**Included studies**

No economic evidence was identified for this review.

See the study selection flow chart in Supplement 2 (Health economics).

**Excluded studies**

No full-text copies of articles were requested for this review and so there is no excluded studies list (see Supplement 2 (Health economics)).

### Summary of studies included in the economic evidence review

No economic evidence was identified for this review (and so there are no economic evidence tables in Supplement 2 (Health economics)).

### Economic model

No economic modelling was undertaken for this review because the committee agreed that other topics were higher priorities for economic evaluation (see Supplement 2 (Health economics)).

### Evidence statements

Oxytocin in the case of delay or suspected delay in labour versus no oxytocin
Outcomes for the woman

**Uterine rupture**

Very low quality evidence from 1 prospective cohort study (N=2592) in women with a previous caesarean section showed a clinically important difference in the incidence of uterine rupture with the rate being lower in women who did not have labour augmented with oxytocin compared to those who did have labour augmented with oxytocin. Very low quality evidence from 1 retrospective cohort study (N=504) in women with a previous caesarean section reported no events of uterine rupture in either group, therefore due to zero events no risk estimate could be calculated.

**Febrile morbidity**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 1 retrospective cohort study (N=504) in women with a previous caesarean section showed no clinically important difference in the incidence of febrile morbidity between women who had labour augmented with oxytocin and those who did not have labour augmented with oxytocin.

**Hysterectomy**

Very low quality evidence from 1 retrospective cohort study (N=504) in women with a previous caesarean section reported no events of hysterectomy in either group, therefore due to zero events no risk estimate could be calculated.

**Mortality**

Very low quality evidence from 1 retrospective cohort study (N=504) in women with a previous caesarean section showed no mortality cases in either group, therefore due to zero events no risk estimate could be calculated.

**Emergency caesarean section**

Very low quality evidence from 1 retrospective cohort study (N=504) in women with a previous caesarean section showed a clinically important difference in the incidence of emergency caesarean section with the rate being lower in women who had labour augmented with oxytocin compared to those who did not have labour augmented with oxytocin.

**Operative vaginal birth**

Very low quality evidence from 2 retrospective cohort studies (N=504 and N=2592) in women with a previous caesarean section showed a clinically important difference in the incidence of operative vaginal birth with the rate being lower in women who did not have labour augmented with oxytocin compared to those who did have labour augmented with oxytocin.

**Duration of intrapartum and postpartum stay**

This outcome was included as it relates to the duration of hospital stay. Very low quality evidence from 1 retrospective cohort study (N=504) in women with a previous caesarean section reported the weighted mean hospital stay (in days) as 3.3 and 1.2 for women who had labour augmented with oxytocin and those who did not have labour augmented with oxytocin, respectively. However, the study authors did not report the standard deviation, thus no mean difference between the 2 groups could be calculated.

**Emergency caesarean section versus continuation of labour**
Outcomes for the woman

**Uterine rupture**

Very low quality evidence from 1 prospective cohort study (N=3274) in women with a previous caesarean section reported a clinically important difference in the incidence of uterine rupture with the rate being lower in women who gave birth vaginally compared to women who had an emergency caesarean section. Very low quality evidence from another prospective cohort study (N=5246) in women with a previous caesarean section showed no clinically important difference in the incidence of uterine rupture between the 2 groups of women. Very low quality evidence from 1 prospective (N=272) and 3 retrospective cohort studies in women with a previous caesarean section (N=40, N=230, and N=212) showed no events of uterine rupture in either group, therefore due to zero events no risk estimate could be calculated.

**Dehiscence**

Very low quality evidence from 1 prospective cohort study (N=1796) and 1 retrospective cohort study (N=308) in women with a previous caesarean section showed a clinically important difference in the incidence of dehiscence between women who gave birth vaginally and those who had an emergency caesarean section with the rate being lower in in women who gave birth vaginally compared to women who had an emergency caesarean section. However, very low quality evidence from 1 prospective cohort study (N=751) and 2 retrospective cohort studies (N=99 and N=207) in women with a previous caesarean section showed no clinically important difference in the incidence of dehiscence between the 2 groups of women.

**Uterine rupture or dehiscence**

Very low quality evidence from 1 prospective cohort study (N=5727) in women with a previous caesarean section reported a clinically important difference in the incidence of uterine rupture or dehiscence with the rate being lower in women who gave birth vaginally compared to women who had an emergency caesarean section.

**Postpartum haemorrhage**

This outcome was included as it might relate to major blood loss. Very low quality evidence from 1 retrospective cohort study (N=2222) in women with a previous caesarean section reported a clinically important difference in the incidence of postpartum haemorrhage with the rate being lower in women who gave birth vaginally compared to women who had an emergency caesarean section. Very low quality evidence from 1 prospective cohort study (N=5246) and 3 retrospective cohort studies (N=51, N=224, and N=522) in women with a previous caesarean section reported no clinically important difference in the incidence of postpartum haemorrhage between the 2 groups of women.

**Blood transfusion**

This outcome was included as it might relate to major blood loss. Very low quality evidence from 2 retrospective cohort studies (N=99 and N=230) in women with a previous caesarean section reported a clinically important difference in the number of women who required a blood transfusion with the rate being lower in women who gave birth vaginally compared to women who had an emergency caesarean section.

**Febrile morbidity**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 2 prospective cohort studies (N=751 and N=1796) and 3 retrospective
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Cohort studies (N=99, N=230, and N=308) in women with a previous caesarean section reported a clinically important difference in the incidence of febrile morbidity with the rate being lower in women who gave birth vaginally compared to women who had an emergency caesarean section. Very low quality evidence from 1 retrospective cohort study (N=40) in women with a previous caesarean section reported no clinically important difference in the incidence of febrile morbidity between the 2 groups of women.

**Febrile morbidity requiring antibiotics**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 1 retrospective study (N=216) in women with a previous caesarean section showed a clinically important difference in the incidence of febrile morbidity requiring antibiotics with the rate being lower in women who gave birth vaginally compared to women who had an emergency caesarean section.

**Endometritis**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 1 prospective cohort study (N=5727) and 2 retrospective cohort studies (N=40 and N=522) in women with a previous caesarean section reported a clinically important difference in the incidence of endometritis with the rate being lower in women who gave birth vaginally compared to women who had an emergency caesarean section. Very low quality evidence from 2 retrospective cohort studies (N=99 and N=207) in women with a previous caesarean section reported no clinically important difference in the incidence of endometritis in the 2 groups of women.

**Chorioamnionitis**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 1 retrospective cohort study (N=522) in women with a previous caesarean section reported a clinically important difference in the incidence of chorioamnionitis between women who gave birth vaginally and those who had an emergency caesarean section.

**Postpartum fever**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 1 retrospective cohort study (N=522) in women with a previous caesarean section reported a clinically important difference in the incidence of postpartum fever with the rate being lower in women who gave birth vaginally compared to women who had an emergency caesarean section.

**Urinary tract infection**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 3 retrospective cohort studies (N=40, N=99, and N=216) in women with a previous caesarean section reported no clinically important difference in the incidence of urinary tract infection between the 2 groups of women.

**Wound infection**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 1 retrospective cohort study (N=216) in women with a previous caesarean section reported no clinically important difference in the incidence of wound infection between women who gave birth vaginally and those who had an emergency caesarean section. Very low quality evidence from 1 retrospective cohort study...
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section

March 2019

study (N=40) in women with a previous caesarean section showed no incidence of events of wound infection in either group, therefore due to zero events no risk estimate could be calculated.

Placenta praevia as an indication for primary caesarean section

Very low quality evidence from 1 retrospective cohort study (N=242) in women with a previous caesarean section reported no clinically important difference in the rate of placenta praevia as an indication for primary caesarean section between women who gave birth vaginally and those who had an emergency caesarean section. Very low quality evidence from 1 retrospective cohort study (N=83) in women with a previous caesarean section showed no events of placenta praevia as an indication for primary caesarean section in either group, therefore due to zero events no risk estimate could be calculated.

Hysterectomy

Very low quality evidence from 1 prospective cohort study (N=751) and 1 retrospective cohort study (N=2222) in women with a previous caesarean section reported no clinically important difference in the incidence of hysterectomy between women who gave birth vaginally and those who had an emergency caesarean section. Very low quality evidence from 1 prospective cohort study (N=5727) and 2 retrospective (N=40 and N=308) cohort studies in women with a previous caesarean section showed no events of hysterectomy in either group, therefore due to zero events no risk estimate could be calculated.

Mortality

Very low quality evidence from 1 retrospective cohort study (N=2222) in women with a previous caesarean section reported no clinically important difference in the incidence of maternal mortality between women who gave birth vaginally and those who had an emergency caesarean section. Very low quality evidence from 1 prospective cohort study (N=272) and 6 retrospective cohort studies (N=40, N=83, N=99, N=230, N=242, and N=522) in women with a previous caesarean section showed no mortality cases in either group, therefore due to zero events no risk estimate could be calculated.

Duration of hospital stay

Very low quality evidence from 1 prospective (N=125) and 2 retrospective (N=216 and N=308) cohort studies in women with a previous caesarean section reported a clinically important difference in the average duration of hospital stay (days) with the duration being shorter in women who gave birth vaginally compared to women who had an emergency caesarean section. Very low quality evidence from 2 prospective (N=751 and N=1796) and 3 retrospective (N=40, N=99, and N=230) cohort studies in women with a previous caesarean section reported the average hospital stay ranging between 2.2 and 3.13 days for women who gave birth vaginally, and between 4.2 and 6.9 days for those who had an emergency caesarean section. However, the study authors did not report the standard deviation, thus no mean difference in duration of hospital stay could be calculated.

Outcomes for the baby

Hypoxic ischaemic encephalopathy

Very low quality evidence from 1 prospective cohort study (N=5727) in women with a previous caesarean section reported a clinically important difference in the incidence
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

of HIE with the rate being lower in babies born vaginally compared to those born via an emergency caesarean section.

**Birth asphyxia**

This outcome was included as it might relate to HIE. Very low quality evidence from 1 prospective cohort study (N=128) and 1 retrospective cohort study (N=522) in women with a previous caesarean section reported no clinically important difference in the incidence of birth asphyxia between babies born vaginally and those born via an emergency caesarean section.

**Mortality**

Very low quality evidence from 1 prospective cohort study (N=125) in women with a previous caesarean section reported no clinically important difference in incidence of mortality between babies born vaginally and those born via an emergency caesarean section. Very low quality evidence from 1 prospective cohort study (N=272) in women with a previous caesarean section reported no mortality cases in either group, therefore due to zero events no risk estimate could be calculated.

**Perinatal mortality**

Very low quality evidence from 1 prospective cohort study (N=128) and 2 retrospective cohort studies (N=242 and N=308n=550) in women with a previous caesarean section reported no clinically important difference in the incidence of perinatal mortality between babies born vaginally and those born via an emergency caesarean section. Very low quality evidence from 1 prospective cohort study (N=5728) in women with a previous caesarean section reported no perinatal mortality cases in either group, therefore due to zero events no risk estimate could be calculated.

**Perinatal mortality (including stillbirths and neonatal deaths occurring from 28 completed weeks of gestation to 4 weeks after the birth; including babies weighing 500 g or less, with a gestational age of >=28 weeks, showing signs of life but dying within 7 days)**

Very low quality evidence from 1 retrospective cohort study (N=856) in women with a previous caesarean section reported a clinically important difference in the incidence of perinatal mortality with the rate being lower in babies born vaginally compared to babies born via an emergency caesarean section.

**Perinatal mortality (including stillbirths and neonatal deaths, corrected for congenital malformation, macerated stillbirths and cases of extreme prematurity)**

Very low quality evidence from 1 retrospective cohort study (N=590) in women with a previous caesarean section reported no clinically important difference in the incidence of perinatal mortality between babies born vaginally and those born via an emergency caesarean section.

**Mortality (birth to 28 days of life)**

Very low quality evidence from 1 retrospective cohort study in women with a previous caesarean section (N=522) reported no events of mortality in either group, therefore due to zero events no risk estimate could be calculated.

**Stillbirth**
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section

March 2019

Very low quality evidence from 1 prospective cohort study (N=125) and 2 retrospective cohort studies (N=207 and N=685) in women with a previous caesarean section reported no clinically important difference in the incidence of stillbirth between babies born vaginally and those born via an emergency caesarean section.

**Neuraxial analgesia versus no neuraxial analgesia**

**Outcomes for the woman**

**Uterine rupture**

Very low quality evidence from 1 retrospective cohort study (N=7149) in women with a previous caesarean section showed no clinically important difference in the incidence of uterine rupture between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not. Another retrospective cohort study (N=237, very low quality evidence) in women with a previous caesarean section reported no uterine rupture cases in either group, therefore due to zero events no risk estimate could be calculated.

**Dehiscence**

Very low quality evidence from 2 retrospective cohort studies (N=237 and N=7149) in women with a previous caesarean section showed no clinically important difference in the incidence of dehiscence between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

**Postpartum haemorrhage**

This outcome was included as it might relate to postpartum haemorrhage. Very low quality evidence from 1 retrospective cohort study (N=7149) in women with a previous caesarean section showed no clinically important difference in the incidence of postpartum haemorrhage between the 2 groups of women.

**Blood transfusion**

This outcome was included as it might relate to postpartum haemorrhage. Very low quality evidence from 1 retrospective cohort study (N=237) in women with a previous caesarean section showed no clinically important difference in the need for blood transfusion between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

**Endometritis**

This outcome was included as it might relate to infectious morbidity. Very low quality evidence from 1 retrospective cohort study (N=237) in women with a previous caesarean section showed no clinically important difference in the incidence of endometritis between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

**Emergency caesarean section**

Very low quality evidence from 1 retrospective cohort study (N=7149) in women with a previous caesarean section showed a clinically important difference in the incidence of emergency caesarean section with the rate being lower in women who received neuraxial analgesia during a trial of labour after previous caesarean section compared to those who did not. Another retrospective cohort study (N=237, very low quality evidence) in women with a previous caesarean section showed no clinically
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section

March 2019

Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section

March 2019

important difference in the number of an emergency caesarean section between the 2 groups of women.

Operative vaginal birth

Very low quality evidence from 2 retrospective cohort studies (N=237 and N=7149) in women with a previous caesarean section showed a clinically important difference in the number of operative vaginal births with the rate being lower in women who did not receive neuraxial analgesia during a trial of labour after previous caesarean section compared to those who received it.

Prolonged hospital stay (duration of hospital stay >3 days for vaginal birth and >4 days for caesarean section)

Very low quality evidence from 1 retrospective cohort study (N=7149) in women with a previous caesarean section showed no clinically important difference in prolonged hospital stay between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

Dehiscence in oxytocin-stimulated labour

Very low quality evidence from 1 retrospective cohort study (N=76) in women with a previous caesarean section who were given oxytocin to stimulate labour showed no clinically important difference in the incidence of dehiscence between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

Emergency caesarean section in oxytocin-stimulated labour

Very low quality evidence from 1 retrospective cohort study (N=76) in women with a previous caesarean section who were given oxytocin to stimulate labour showed no clinically important difference in the incidence of an emergency caesarean section between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

Operative vaginal birth in oxytocin-stimulated labour

Very low quality evidence from 1 retrospective cohort study (N=76) in women with a previous caesarean section who were given oxytocin to stimulate labour showed no clinically important difference in the number of operative vaginal births between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

Dehiscence in spontaneous labour

Very low quality evidence from 1 retrospective cohort study (N=43) in women with a previous caesarean section who had spontaneous labour showed no clinically important difference in the incidence of dehiscence between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

Emergency caesarean section in spontaneous labour

Very low quality evidence from 1 retrospective cohort study (N=43) in women with a previous caesarean section who had spontaneous labour showed no clinically important difference in the incidence of an emergency caesarean section between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.
Operative vaginal birth in spontaneous labour

Very low quality evidence from 1 retrospective cohort study (N=43) in women with a previous caesarean section who had spontaneous labour showed no clinically important difference in the number of operative vaginal births between women who received neuraxial analgesia during a trial of labour after previous caesarean section and those who did not.

The committee’s discussion of the evidence

Interpreting the evidence

The outcomes that matter most

The committee prioritised major maternal morbidities such as uterine rupture or dehiscence, major blood loss (>1000 ml), infectious morbidity, placenta praevia or accreta in future pregnancies, pelvic adhesions complicating any future abdominopelvic surgery, or hysterectomy as critical outcomes because these are serious and potentially life-impacting complications specific to women with 1 or more previous caesarean sections and likely to inform and influence recommendations for women and the choices they make about care.

The committee also rated the women’s experience of labour and birth, including experience of her birth companion(s), separation of the woman and the baby and breastfeeding initiation as critical outcomes because they agreed this was essential information to support women’s informed choice and they were aware that women’s choice of intervention is often restricted when they have had a previous caesarean section. The committee considered major neonatal morbidities such as respiratory and HIE to be critical outcomes because these underpin the rationale for interventions that are often recommended currently to avoid neonatal morbidities and thus they affect the choices women make. The committee rated mortality in the baby from any cause as an important outcome rather than a critical outcome because it occurs less frequently than morbidity in the baby, but it was agreed that interventions are often recommended to avoid mortality and morbidity.

The committee rated maternal mortality as an important rather than critical outcome because it is rare. They rated emergency caesarean section and instrumental birth as important outcomes for all comparisons except continuation of labour versus emergency caesarean section) because these interventions are likely to impact negatively on the woman and her birth companion(s)’ experience of labour and birth, the mother-baby breastfeeding relationship and the woman’s perinatal mental health.

The quality of the evidence

No randomised controlled trials were identified. Included studies were either prospective or retrospective cohort studies. The quality of the evidence from these studies was assessed with GRADE and was rated as very low mainly due to high risk of bias and imprecision.

The committee agreed to downgrade the outcome febrile morbidity for indirectness because fever in labour is not a good proxy for infectious morbidity (fever in labour is not necessarily due to an infection). The committee discussed that fever is to be avoided because it can have harmful effects, but it is not a good proxy for infection.
Benefits and harms

Evidence was identified for 3 comparisons specified in the review protocol: emergency caesarean section versus continuation of labour; oxytocin versus no oxytocin; and regional (neuraxial) analgesia versus no regional (neuraxial) analgesia.

Based on the evidence and their expertise the committee agreed that women in labour with a previous caesarean section should be informed that a vaginal birth is associated with a small chance of uterine rupture, that performing an emergency caesarean section may be associated with increased risks of heavy bleeding (potentially needing a blood transfusion), infection, a longer hospital stay, and that future pregnancies may be complicated by, for example, placenta praevia or placenta accreta (see the NICE guideline on caesarean section (CG132) for further details).

There was no strong evidence to suggest a difference in outcomes for the baby between a vaginal birth or a repeat caesarean section, and the committee felt that healthcare professionals should inform women about this to aid decisions about mode of birth.

The committee emphasised that women with a previous caesarean section and who have also had a previous vaginal birth are likely to have a lower risk of complications during labour and women should be informed of this.

Although no evidence was found regarding routine insertion of an intravenous cannula versus no intravenous cannula, labour or birth in a birthing pool versus labour or birth without a birthing pool, amniotomy versus no amniotomy, fasting versus no fasting (or clear fluids only), limited mobility (supine position or being restricted to the bed) versus unlimited mobility (upright positions or being mobile) the committee felt confident in making recommendations regarding some of these interventions based upon their collective knowledge, experience and expertise while taking into consideration the effective use of NHS resources.

The committee agreed that for a woman in labour with a previous caesarean section the risk of needing intravenous access for an urgent blood transfusion would not necessarily be higher than for a woman in labour without a previous caesarean section. The committee also agreed that it was important to take women’s experiences into account and they noted that inserting an intravenous cannula may be unpleasant for women. They decided, therefore, not to recommend routine insertion of an intravenous cannula. Based on their experience, many women in labour with a previous caesarean section would have an intravenous cannula inserted routinely in current practice, and so they emphasised that this was not necessary by including a ‘do not routinely do’ recommendation.

The committee discussed the evidence and agreed that healthcare professionals should inform women in labour with a previous caesarean section that using oxytocin for a delay in the first or second stage of labour, or using regional analgesia, is associated with a reduced chance of needing another caesarean section. However, augmentation of labour with oxytocin, and use of regional analgesia, might have an increased chance of an instrumental vaginal birth. The committee emphasised the importance of communicating this information to women so that they can make fully informed decisions about mode of birth. They also agreed that the increased chance of uterine rupture with augmentation of labour using oxytocin was a priority to be communicated to the woman, as this would be a more serious outcome than the chance of another caesarean section or the chance of an instrumental birth.

Based on their knowledge, experience and expertise, the committee agreed that women in labour with a previous caesarean section should be offered a full range of
options for pain relief, including labour and birth in water. Although no evidence was identified for inclusion for this aspect of the review, the committee agreed strongly that an absence of evidence in support of using the birthing pool should not be interpreted as meaning that labour and birth in water is contraindicated for this group of women.

No evidence was found for routine amniotomy in women in labour with a previous caesarean section. The committee used their experience and expertise to recommend that amniotomy should not be offered routinely. However, they recognised that amniotomy might sometimes be offered to women with a previous caesarean section: in line with the NICE guideline on intrapartum care for healthy women and babies (CG190) amniotomy might be offered if there was a delay in labour.

The committee was aware of recommendations in the NICE guideline on intrapartum care for healthy women and babies (CG190) with regard to food and drink in labour, controlling gastric acidity, and position in labour (including the latent first stage) and birth. In the absence of any evidence to modify routine practice for women in labour with a previous caesarean section, the committee agreed that the recommendations in the NICE guideline on intrapartum care for healthy women and babies (CG190) should be followed for this group of women.

There was no evidence for the use of scoring systems to direct management of labour and birth for women in labour with a previous caesarean section and the committee decided not to make any recommendations for this aspect of intrapartum care.

Cost effectiveness and resource use

The committee considered that there was no evidence to support routine intravenous cannulation for women in labour with a previous caesarean section and therefore noted that the recommendation not to routinely insert an intravenous cannula for these women would be cost saving for the NHS.

The committee did not think there was compelling clinical evidence to recommend one mode of birth over another for women in labour who have had a previous caesarean section. However, they believed that their recommendations supporting women’s birth choices, including continuation of labour, could lead to cost savings for the healthcare system.

The committee noted that there is considerable variation in practice with how the first and second stages of labour are managed for women with a previous caesarean section, but they did not anticipate that their recommendations would have a significant resource impact for the NHS.

Other factors the committee took into account

The committee was aware that continuous cardiotocography is usually advised for women in labour who have had a previous caesarean section because of an increased risk of serious medical problems for the baby. They noted that the NICE guideline on caesarean section (CG132) recommends offering women planning a vaginal birth who have had a previous caesarean section continuous cardiotocography during labour. In terms of offering continuous cardiotocography to women in labour who have had a previous caesarean section, the committee noted that it is uncertain whether continuous cardiotocography allows risk to be identified sooner than if intermittent auscultation is used. The committee agreed to include
specific recommendations to offer continuous cardiotocography to women in labour with a previous caesarean section if using oxytocin for delay in the first or second stage of labour, or if performing amniotomy, while making a research recommendation to inform future guidance (see Appendix L – Research recommendations for further details).
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Intrapartum care for women with existing medical conditions or obstetric complications and their babies

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Meehan 1989

Meier 1982

Miller 1992

Morewood 1973

Paul 1985

Phelan 1987
Intrapartum care for women with existing medical conditions or obstetric complications and their babies


Raynor 1993


Rietveld 2015


Sakala 1990


Stovall 1987


Yetman 1989

## Appendices

### Appendix A – Review protocol

**Intrapartum care for women with previous caesarean section – management of the first and second stages of labour**

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
<th>Working notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area in the scope</strong></td>
<td>Women at high risk of adverse outcomes for themselves and/or their baby because of obstetric complications or other reasons – intrapartum care for women with previous caesarean section – management of the first and second stages of labour</td>
<td></td>
</tr>
<tr>
<td><strong>Review question in the scope</strong></td>
<td>How should the first and second stages of labour be managed for women with previous caesarean section?</td>
<td></td>
</tr>
<tr>
<td><strong>Review question for the guideline</strong></td>
<td>How should the first and second stages of labour be managed for women with previous caesarean section?</td>
<td></td>
</tr>
<tr>
<td><strong>Objective</strong></td>
<td>The aim of this review is to determine how the first and second stages of labour should be managed for women with previous caesarean section. In developing the review protocol the committee was aware that the overall caesarean birth rate in England for 2013–2014 was 26.2% (HSCIC 2015)</td>
<td></td>
</tr>
<tr>
<td><strong>Population and directness</strong></td>
<td>Women in the first or second stage of labour with 1 or more previous caesarean sections</td>
<td>Studies in which up to 34% of the women have multiple pregnancy will be included. Evidence in which any of the women have multiple pregnancy should be downgraded for indirectness.</td>
</tr>
</tbody>
</table>
| **Intervention**          | **Intervention 1**  
Routine insertion of IV cannula  
**Intervention 2**  
Oxytocin in the case of suspected or confirmed delay in labour  
**Intervention 3**  
Emergency caesarean section  
**Intervention 4**  
Labour or birth in a birth pool  
**Intervention 5**  
Neuraxial analgesia  
**Intervention 6**  
Amniotomy |                                                                              |
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section
March 2019

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
<th>Working notes</th>
</tr>
</thead>
</table>
|      | Intervention 7  
|      | Fasting (no food or drink) | |
|      | Intervention 8  
|      | Antacid prophylaxis (ranitidine, omeprazole or sodium citrate) | |
|      | Intervention 9  
|      | Limited mobility (supine, or restricted to the bed) | |
|      | Intervention 10  
|      | Use of scoring systems (for example, VBAC or TOLAC) | |

**Comparison**

<table>
<thead>
<tr>
<th>Comparison</th>
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</table>
| Comparison 1  
| No IV cannula | |
| Comparison 2  
| No oxytocin | |
| Comparison 3  
| Continuation of labour | |
| Comparison 4  
| Labour or birth without birth pool | |
| Comparison 5  
| No neuraxial analgesia (the woman will not be having neuraxial analgesia but she might be having pharmacological analgesia such as paracetamol, codeine, morphine or pethidine) | |
| Comparison 6  
| No amniotomy | |
| Comparison 7  
| • Not fasting  
| • Clear fluids only | |
| Comparison 8  
| No antacid prophylaxis | |
| Comparison 9  
| Unlimited mobility (upright positions, or mobile) | |
| Comparison 10  
| No use of scoring systems | |

**Outcomes**

**Critical outcomes**

- for the woman:  
  - major morbidities:  
    - uterine rupture or dehiscence
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Evidence review for previous caesarean section
March 2019

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
<th>Working notes</th>
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<tbody>
<tr>
<td>-</td>
<td>major blood loss (&gt;1000 ml)</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>infectious morbidity</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>placenta praevia and/or accreta in future pregnancies or pelvic adhesions complicating any future abdominopelvic surgery</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>hysterectomy</td>
<td>-</td>
</tr>
<tr>
<td>o woman’s experience of labour and birth, including experience of the birth companion, separation of the woman and baby and breastfeeding initiation</td>
<td>-</td>
<td></td>
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<tr>
<td>• for the baby:</td>
<td>-</td>
<td></td>
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<tr>
<td>o major morbidities (respiratory and HIE)</td>
<td>-</td>
<td></td>
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</tbody>
</table>

**Important outcomes**

- for the woman:
  - mortality
  - emergency caesarean section/operative vaginal birth for all comparisons except comparison 3
- for the baby:
  - mortality from any cause

### Outcomes of limited importance

- for the woman:
  - admission to HDU/ITU and duration of hospital stay

### Importance of outcomes

Preliminary classification of the outcomes for decision making:

- critical (up to 3 outcomes)
- important but not critical (up to 3 outcomes)
- of limited importance (1 outcome)

### Setting

All birth settings

### Stratified, subgroup and adjusted analyses

Groups that will be reviewed and analysed separately:

- spontaneous versus induced labour
- first stage of labour versus second stage of labour
- number of previous caesarean sections
- previous vaginal birth
- women who had planned an elective section

In the presence of heterogeneity, the following subgroups will be considered for sensitivity analysis:

- women with previous uterine rupture
- women with classical caesarean scar versus low transverse incision scar versus low vertical incision scar
- women with complicated uterine scars
- gestational age
- presentation
- additional obstetric complications
- BMI
- duration of labour
- ruptured membranes
- myomectomy

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Evidence review for previous caesarean section
March 201934
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

#### Evidence review for previous caesarean section

**March 2019**

#### Item | Details | Working notes
--- | --- | ---
**Potential confounders:**  
• maternal age  
• previous vaginal birth  
• duration of labour  
• BMI  
• size of the baby

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<th>English</th>
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| **Study design** |  
• Published full text papers only  
• Systematic reviews  
• RCTs  
• Only if RCTs unavailable or there is limited data to inform decision making:  
  o prospective or retrospective comparative observational studies (including cohort and case-control studies)  
• Prospective study designs will be prioritised over retrospective study designs  
• Conference abstracts will not be considered |

The committee agreed that as there were no prospective studies to be included for some intervention-comparison pairs that retrospective studies would be considered for all intervention-comparison pairs.

| **Search strategy** | Sources to be searched: Medline, Medline In-Process, CCTR, CDSR, DARE, HTA and Embase.  
Limits (e.g. date, study design): All study designs. Apply standard animal/non-English language filters. No date limit.  
Supplementary search techniques: No supplementary search techniques were used.  
See appendix B for full strategies |

| **Review strategy** | Appraisal of methodological quality:  
• the methodological quality of each study will be assessed using checklists recommended in the NICE guidelines manual 2014 (for example, AMSTAR or ROBIS for systematic reviews, and Cochrane RoB tool for RCTs) and the quality of the evidence for each outcome (that is, across studies) will be assessed using GRADE  
• if studies report only p-values, this information will be recorded in GRADE tables without an assessment of imprecision  

Synthesis of data:  
• meta-analysis will be conducted where appropriate  
• default MIDs will be used; 0.8 and 1.25 for dichotomous outcomes; 0.5 times the SD of the measurement in the control arm (or median score across control arms if multiple studies are included) for continuous outcomes  
• for continuous data, change scores will be used in preference to final scores for data from non-RCT studies; final and change scores will not be pooled; if any study reports both, the method used in the majority of studies will be adopted |

Review questions selected as high priorities for health economic analysis (and those selected as medium priorities and where health economic analysis could influence recommendations) will be subject to dual weeding and study selection; any discrepancies will be resolved through discussion between the first and second reviewers or by reference to a third person. This review question was not prioritised for health economic analysis and so no formal dual weeding, study selection (inclusion/exclusion) or
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Evidence review for previous caesarean section

#### March 2019

<table>
<thead>
<tr>
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<th>Details</th>
<th>Working notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Working notes</td>
<td>data extraction into evidence tables will be undertaken. However, internal (NGA) quality assurance processes will include consideration of the outcomes of weeding, study selection and data extraction and the committee will review the results of study selection and data extraction.</td>
<td></td>
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<tr>
<td>2. Equalities</td>
<td>Equalities considerations will be considered systematically in relation to the available evidence and draft recommendations. The guideline scope includes women with cognitive or physical disability as populations for whom there may be equalities issues. Women who have received no antenatal care will be considered as a subgroup for all systematic reviews performed within the medical conditions work stream and a specific question has been included in the obstetric complications work stream for this population.</td>
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</tbody>
</table>

**AMSTAR:** Assessing the Methodological Quality of Systematic Reviews; **BMI:** body mass index; **CDSR:** Cochrane Database of Systematic Reviews; **CENTRAL:** Cochrane Central Register of Controlled Trials; **CS:** caesarean section; **DARE:** Database of Abstracts of Reviews of Effects; **ERCS:** elective repeat caesarean section; **GRADE:** Grading of Recommendations Assessment, Development and Evaluation; **HDU:** high dependency unit; **HSCIC:** Health & Social Care Information Centre; **HIE:** hypoxic ischaemic encephalopathy; **HTA:** Health Technology Assessment; **IV:** intravenous; **ITU:** intensive therapy unit; **MID:** minimally important difference; **NGA:** National Guideline Alliance; **NICE:** National Institute for Health and Care Excellence; **RCOG:** Royal College of Obstetricians and Gynaecologists; **RCT:** randomised controlled trial; **RoB:** risk of bias; **ROBIS:** Risk of Bias in Systematic Reviews; **SD:** standard deviation; **TOLAC:** trial of labour after previous caesarean section; **VBAC:** vaginal birth after previous caesarean section
### Appendix B – Literature search strategies

**Intrapartum care for women with previous caesarean section – management of the first and second stages of labour**

**Database:** Medline; Medline EPub Ahead of Print; and Medline In-Process & Other Non-Indexed Citations

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<tr>
<td>2</td>
<td>CESAREAN SECTION/ and (repeat$ or previous$).ti.</td>
</tr>
<tr>
<td>3</td>
<td>CESAREAN SECTION/ and (repeat$ or previous$).ab. /freq=2</td>
</tr>
<tr>
<td>4</td>
<td>((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj3 (repeat$ or previous$)).ti,ab.</td>
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<tr>
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<td>VAGINAL BIRTH AFTER CESAREAN/</td>
</tr>
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</tr>
<tr>
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<td>VBAC.ti,ab.</td>
</tr>
<tr>
<td>8</td>
<td>TRIAL OF LABOR/ and CESAREAN SECTION/</td>
</tr>
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<td>9</td>
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<tr>
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<tr>
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<td>or/12-13</td>
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<td>BATHS/</td>
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<td>(birth$ adj3 water).ti,ab.</td>
</tr>
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<td>or/33-36</td>
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<td>AROM.ti,ab.</td>
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Evidence review for previous caesarean section
March 2019
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

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**Database: Cochrane Central Register of Controlled Trials**

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<td>CANNULA/</td>
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<tr>
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<td>cannula?.ti,ab,kw.</td>
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March 2019

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Evidence review for previous caesarean section
March 2019

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<td>(vagina$ adj1 (birth$ or born or deliver$) adj2 after$ adj2 (c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$))).tw.</td>
</tr>
<tr>
<td>7</td>
<td>VBAC.tw.</td>
</tr>
<tr>
<td>8</td>
<td>TRIAL OF LABOR/ and CESAREAN SECTION/</td>
</tr>
<tr>
<td>9</td>
<td>(trial adj2 labo?r adj3 after$ adj3 (c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$))).tw.</td>
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</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
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<th>Searches</th>
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<tr>
<td>10</td>
<td>TOLAC.tw.</td>
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<tr>
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<td>or/1-10</td>
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<tr>
<td>12</td>
<td>CANNULA/</td>
</tr>
<tr>
<td>13</td>
<td>cannula?.tw.</td>
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<tr>
<td>14</td>
<td>or/12-13</td>
</tr>
<tr>
<td>15</td>
<td>OXYTOCIN/</td>
</tr>
<tr>
<td>16</td>
<td>(Oxytocin? or Pitocin? or syntocinon?).mp.</td>
</tr>
<tr>
<td>17</td>
<td>or/15-16</td>
</tr>
<tr>
<td>18</td>
<td>((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj3 (emergenc$ or during labo$r$)).tw.</td>
</tr>
<tr>
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<tr>
<td>20</td>
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</tr>
<tr>
<td>21</td>
<td>BATHS/</td>
</tr>
<tr>
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</tr>
<tr>
<td>23</td>
<td>(birth$ adj3 water).tw.</td>
</tr>
<tr>
<td>24</td>
<td>or/19-23</td>
</tr>
<tr>
<td>25</td>
<td>ANALGESIA, EPIDURAL/</td>
</tr>
<tr>
<td>26</td>
<td>INJECTIONS, EPIDURAL/</td>
</tr>
<tr>
<td>27</td>
<td>((Spinal$ or spinous$) adj5 analges$).tw.</td>
</tr>
<tr>
<td>28</td>
<td>epidural$.tw.</td>
</tr>
<tr>
<td>29</td>
<td>CSE.tw.</td>
</tr>
<tr>
<td>30</td>
<td>((central$ or regional$) adj5 neuraxial$ adj5 block$).tw.</td>
</tr>
<tr>
<td>31</td>
<td>(neuraxial$ adj5 analges$).tw.</td>
</tr>
<tr>
<td>32</td>
<td>or/25-31</td>
</tr>
<tr>
<td>33</td>
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<td>ANALGESIA, OBSTETRICAL/</td>
</tr>
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</tr>
<tr>
<td>37</td>
<td>or/33-36</td>
</tr>
<tr>
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<td>AMNION/su [Surgery]</td>
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</tr>
<tr>
<td>40</td>
<td>(artificial$ adj3 ruptur$ adj3 membrane?).tw.</td>
</tr>
<tr>
<td>41</td>
<td>AROM.tw.</td>
</tr>
<tr>
<td>42</td>
<td>or/38-41</td>
</tr>
<tr>
<td>43</td>
<td>FASTING/</td>
</tr>
<tr>
<td>44</td>
<td>fasting.tw.</td>
</tr>
<tr>
<td>45</td>
<td>(no adj3 (food? or drink$)).tw.</td>
</tr>
<tr>
<td>46</td>
<td>&quot;nil by mouth&quot;.tw.</td>
</tr>
<tr>
<td>47</td>
<td>or/43-46</td>
</tr>
<tr>
<td>48</td>
<td>exp ANTACIDS/</td>
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</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

# Searches

49 (Antacid? or Aluminum Hydroxide or Bismuth or Calcium Carbonate or Magnesium Hydroxide or Magnesium Oxide or sodium citrate).mp.

50 RANITIDINE/
51 Ranitidine.mp.
52 OMEPRAZOLE/
53 omeprazole.mp.
54 or/48-53
55 BED REST/
56 (bed? adj3 rest$).tw.
57 SUPINE POSITION/
58 supine$.tw.
59 (limit$ adj3 mobil$).tw.
60 or/55-59
61 (scor$ adj3 (system? or tool?)).tw.
62 (scor$ adj3 (VBAC or TOLAC)).tw.
63 (screen$ adj3 (system? or tool?)).tw.
64 or/61-63
65 11 and 14
66 11 and 17
67 11 and 18
68 11 and 24
69 11 and 32
70 11 and 37
71 11 and 42
72 11 and 47
73 11 and 54
74 11 and 60
75 11 and 64
76 or/65-75

Database: Embase

# Searches

1 REPEAT CESAREAN SECTION/
2 CESAREAN SECTION/ and (repeat$ or previous$).ti.
3 CESAREAN SECTION/ and (repeat$ or previous$).ab. /freq=2
4 ((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj3 (repeat$ or previous$)).ti,ab.
5 VAGINAL BIRTH AFTER CESAREAN/
6 (vagina$ adj1 (birth$ or born or deliver$) adj2 after$ adj2 (c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$))).ti,ab.
7 VBAC.ti,ab.
8 “TRIAL OF LABOR”/ and CESAREAN SECTION/
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>(trial adj2 labo?r adj3 after$ adj3 (c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$))).ti,ab.</td>
</tr>
<tr>
<td>10</td>
<td>TOLAC.ti,ab.</td>
</tr>
<tr>
<td>11</td>
<td>or/1-10</td>
</tr>
<tr>
<td>12</td>
<td>CANNULA/</td>
</tr>
<tr>
<td>13</td>
<td>cannula?.ti,ab.</td>
</tr>
<tr>
<td>14</td>
<td>or/12-13</td>
</tr>
<tr>
<td>15</td>
<td>*OXYTOCIN/</td>
</tr>
<tr>
<td>16</td>
<td>(Oxytocin? or Pitocin? or syntocinon?).ti.</td>
</tr>
<tr>
<td>17</td>
<td>(Oxytocin? or Pitocin? or syntocinon?).ab. /freq=2</td>
</tr>
<tr>
<td>18</td>
<td>or/15-17</td>
</tr>
<tr>
<td>19</td>
<td>((c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)) adj3 (emergenc$ or during labo?r$)).ti,ab.</td>
</tr>
<tr>
<td>20</td>
<td>HYDROTHERAPY/</td>
</tr>
<tr>
<td>21</td>
<td>hydrotherap$.ti,ab.</td>
</tr>
<tr>
<td>22</td>
<td>BATH/</td>
</tr>
<tr>
<td>23</td>
<td>((birth$ or water) adj3 pool?).ti,ab.</td>
</tr>
<tr>
<td>24</td>
<td>WATER BIRTH/</td>
</tr>
<tr>
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<td>(birth$ adj3 water).ti,ab.</td>
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<tr>
<td>26</td>
<td>or/20-25</td>
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<tr>
<td>27</td>
<td>EPIDURAL ANALGESIA/</td>
</tr>
<tr>
<td>28</td>
<td>*EPIDURAL DRUG ADMINISTRATION/</td>
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<tr>
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<tr>
<td>30</td>
<td>epidural$.ti.</td>
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<tr>
<td>31</td>
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</tr>
<tr>
<td>32</td>
<td>CSE.ti,ab.</td>
</tr>
<tr>
<td>33</td>
<td>((central$ or regional$) adj5 neuraxial$ adj5 block$).ti,ab.</td>
</tr>
<tr>
<td>34</td>
<td>(neuraxial$ adj5 analges$).ti,ab.</td>
</tr>
<tr>
<td>35</td>
<td>or/27-34</td>
</tr>
<tr>
<td>36</td>
<td>PATIENT CONTROLLED ANALGESIA/</td>
</tr>
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<td>37</td>
<td>(patient? adj3 control$ adj3 analges$).ti,ab.</td>
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<tr>
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<td>OBSTETRIC ANALGESIA/</td>
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<td>(obstetric$ adj3 analges$).ti,ab.</td>
</tr>
<tr>
<td>40</td>
<td>or/36-39</td>
</tr>
<tr>
<td>41</td>
<td>AMNIOTOMY/</td>
</tr>
<tr>
<td>42</td>
<td>Amniotom$.ti,ab.</td>
</tr>
<tr>
<td>43</td>
<td>(artificial$ adj3 ruptur$ adj3 membrane?).ti,ab.</td>
</tr>
<tr>
<td>44</td>
<td>AROM.ti,ab.</td>
</tr>
<tr>
<td>45</td>
<td>or/41-44</td>
</tr>
<tr>
<td>46</td>
<td>DIET RESTRICTION/</td>
</tr>
<tr>
<td>47</td>
<td>fasting.ti,ab.</td>
</tr>
</tbody>
</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
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</thead>
<tbody>
<tr>
<td>48</td>
<td>(no adj3 (food? or drink$)).ti,ab.</td>
</tr>
<tr>
<td>49</td>
<td>&quot;nil by mouth&quot;.ti,ab.</td>
</tr>
<tr>
<td>50</td>
<td>or/46-49</td>
</tr>
<tr>
<td>51</td>
<td>exp ANTACID AGENT/</td>
</tr>
<tr>
<td>52</td>
<td>(Antacid? or Aluminum Hydroxide or Bismuth or Calcium Carbonate or Magnesium Hydroxide or Magnesium Oxide).mp.</td>
</tr>
<tr>
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<td>CITRATE SODIUM/</td>
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<td>sodium citrate.mp.</td>
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<tr>
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<td>RANITIDINE/</td>
</tr>
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<td>56</td>
<td>Ranitidine.mp.</td>
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<td>OMEPRAZOLE/</td>
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<td>58</td>
<td>omeprazole.mp.</td>
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<tr>
<td>59</td>
<td>or/51-58</td>
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<td>BED REST/</td>
</tr>
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<td>61</td>
<td>(bed? adj3 rest$).ti,ab.</td>
</tr>
<tr>
<td>62</td>
<td>SUPINE POSITION/</td>
</tr>
<tr>
<td>63</td>
<td>supine$.ti,ab.</td>
</tr>
<tr>
<td>64</td>
<td>(limit$ adj3 mobil$).ti,ab.</td>
</tr>
<tr>
<td>65</td>
<td>or/60-64</td>
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<td>66</td>
<td>(scor$ adj3 (system? or tool?)).ti,ab.</td>
</tr>
<tr>
<td>67</td>
<td>(scor$ adj3 (VBAC or TOLAC)).ti,ab.</td>
</tr>
<tr>
<td>68</td>
<td>(screen$ adj3 (system? or tool?)).ti,ab.</td>
</tr>
<tr>
<td>69</td>
<td>or/66-68</td>
</tr>
<tr>
<td>70</td>
<td>11 and 14</td>
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<td>79</td>
<td>11 and 65</td>
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<td>11 and 69</td>
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<td>or/70-80</td>
</tr>
<tr>
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<td>limit 81 to english language</td>
</tr>
<tr>
<td>83</td>
<td>letter.pt. or LETTER/</td>
</tr>
<tr>
<td>84</td>
<td>note.pt.</td>
</tr>
<tr>
<td>85</td>
<td>editorial.pt.</td>
</tr>
<tr>
<td>86</td>
<td>CASE REPORT/ or CASE STUDY/</td>
</tr>
<tr>
<td>87</td>
<td>(letter or comment*).ti.</td>
</tr>
</tbody>
</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Appendix C – Clinical evidence study selection

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

Figure 1: Flow diagram of clinical article selection for intrapartum care for women with previous caesarean section – management of the first and second stages of labour

<table>
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<td>89</td>
<td>RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.</td>
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<td>88 not 89</td>
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<tr>
<td>91</td>
<td>ANIMAL/ not HUMAN/</td>
</tr>
<tr>
<td>92</td>
<td>NONHUMAN/</td>
</tr>
<tr>
<td>93</td>
<td>exp ANIMAL EXPERIMENT/</td>
</tr>
<tr>
<td>94</td>
<td>exp EXPERIMENTAL ANIMAL/</td>
</tr>
<tr>
<td>95</td>
<td>ANIMAL MODEL/</td>
</tr>
<tr>
<td>96</td>
<td>exp RODENT/</td>
</tr>
<tr>
<td>97</td>
<td>(rat or rats or mouse or mice).ti.</td>
</tr>
<tr>
<td>98</td>
<td>or/90-97</td>
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<tr>
<td>99</td>
<td>82 not 98</td>
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</table>

Publications included in review, N=27

Publications excluded from review, N=202 (refer to excluded studies list)

Titles and abstracts identified, N=1293

Full copies requested for assessment of eligibility, N=229

Excluded, N=1064 (not relevant population, design, intervention, comparison, outcomes)
Appendix D – Excluded studies

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

Clinical studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Reason for exclusion</th>
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<tbody>
<tr>
<td>Acmaz, G., Boztosun, A., Yuvaci, H., Inal, A., Muderris, I. I., Is spinal anesthesia really innocent?, HealthMED, 6, 945-949, 2012</td>
<td>Not relevant population as all women had an elective caesarean section (CS)</td>
</tr>
<tr>
<td>Adair, C. D., Sanchez-Ramos, L., Gaudier, F. L., Kaunitz, A. M., McDyer, D. C., Briones, D., Labor induction in patients with previous cesarean section, American Journal of Perinatology, 12, 450-4, 1995</td>
<td>Not relevant comparison, that is, women with a previous CS versus those with no previous CS</td>
</tr>
<tr>
<td>Aisien, A. O., Oronsaye, A. U., Vaginal birth after one previous caesarean section in a tertiary institution in Nigeria, Journal of Obstetrics &amp; Gynaecology, 24, 886-90, 2004</td>
<td>No data were reported for the relevant comparison, that is, vaginal birth versus an emergency CS were reported</td>
</tr>
<tr>
<td>Al-Zirqi, I., Daltevit, A. K., Forsen, L., Stray-Pedersen, B., Vangen, S., Risk factors for complete uterine rupture, American Journal of Obstetrics &amp; Gynecology, 216, 165.e1-165.e8, 2017</td>
<td>The article describes risk factors for uterine rupture in women with a previous CS</td>
</tr>
<tr>
<td>Al-Zirqi, I., Stray-Pedersen, B., Forsen, L., Vangen, S., Uterine rupture after previous caesarean section, [Erratum appears in BJOG. 2010 Jul;117(8):1041], BJOG: An International Journal of Obstetrics and Gynaecology, 117, 809-820, 2010</td>
<td>No outcomes were reported for the relevant comparison, that is, vaginal birth versus an emergency CS</td>
</tr>
<tr>
<td>Anonymous, Trial of labor after cesarean section is safe, Journal of Family Practice, 53, 766-768, 2004</td>
<td>Short description of a systematic review on the incidence and consequences of uterine rupture in women with previous CS</td>
</tr>
<tr>
<td>Asaad, K., Alaily, B., Oxytocin use and delivery outcome in women with one previous caesarean section and pre-labour rupture of the membranes at term, Journal of Obstetrics and Gynaecology, 14, 420-422, 1994</td>
<td>Induction of labour</td>
</tr>
<tr>
<td>Ashwal, E., Hiersch, L., Melamed, N., Ben-Zion, M., Brezovsky, A., Wiznitzer, A., Yogev, Y., Pregnancy</td>
<td>Not relevant comparison, that is, induced versus spontaneous labour</td>
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<tr>
<td>Study</td>
<td>Reason for exclusion</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------------------</td>
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<tr>
<td>outcome after induction of labor in women with previous cesarean section, Journal of Maternal-Fetal and Neonatal Medicine, 28, 386-391, 2015</td>
<td></td>
</tr>
<tr>
<td>Balachandran, L., Vaswani, P.R., Mogotlane, R., Pregnancy outcome in women with previous one cesarean section, Journal of Clinical and Diagnostic Research, 8, 99-102, 2014</td>
<td>No data for the comparison vaginal birth versus emergency CS were reported</td>
</tr>
<tr>
<td>Beall, M., Eglinton, G. S., Clark, S. L., Phelan, J. P., Vaginal delivery after cesarean section in women with unknown types of uterine scar, 29, 31-5, 1984</td>
<td>Not relevant comparison, that is, low transverse scar versus unknown types of scar</td>
</tr>
<tr>
<td>Belachew, Johanna, Eurenius, Karin, Mulic-Lutvica, Ajlana, Axelsson, Ove, Placental location, postpartum hemorrhage and retained placenta in women with a previous cesarean section delivery: a prospective cohort study, Upsala journal of medical sciences, 122, 185-189, 2017</td>
<td>No relevant comparison was reported</td>
</tr>
<tr>
<td>Bhat, B. P. R., Savant, R., Kamath, A., Outcome of a post caesarean pregnancy in a tertiary center of a developing country, Journal of Clinical and Diagnostic Research, 4, 2005-2009, 2010</td>
<td>Descriptive study about the commonest indication for elective and emergency CS. No relevant comparison</td>
</tr>
<tr>
<td>Black, M., Kilonzo, M., Bhattacharya, S., Morbidity of intended birth mode after previous cesarean section, Archives of Disease in Childhood: Fetal and Neonatal Edition, 98, 2013</td>
<td>Conference abstract</td>
</tr>
<tr>
<td>Boatin, A. A., Adu-Bonsaffoh, K., Wylie, B. J., Obed, S. A., Evaluating Facility-Based Decision-Making in Women with a Prior Cesarean Delivery and Association with Maternal and Perinatal Outcomes, Maternal &amp; Child Health Journal, 11, 11, 2017</td>
<td>Multiple pregnancies were included. The study authors did not report how many. Moreover, the context of antenatal care and labour is quite different from the UK context. The study authors reported that &quot;antenatal care, and thus the chance for early counseling and decision-making, often occurs much less frequently... Additionally, evidence from sub-Saharan Africa suggests that most women with a prior CD [cesarean delivery] present in established labor whether or not TOLAC [trial of labour after cesarean] is appropriate&quot; (p. 1846)</td>
</tr>
<tr>
<td>Study</td>
<td>Reason for exclusion</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
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<tr>
<td>Bretelle, F., Cravello, L., Shojai, R., Roger, V., D’Ercole, C., Blanc, B., Vaginal birth following two previous cesarean sections, European Journal of Obstetrics, Gynecology, &amp; Reproductive Biology, 94, 23-6, 2001</td>
<td>No data for the emergency CS group were reported</td>
</tr>
<tr>
<td>Bridle, L., VBAC to the future, Practising Midwife, 13, 29-30, 2010</td>
<td>Narrative article about vaginal birth after caesarean section (VBAC)</td>
</tr>
<tr>
<td>Brody, C. Z., Kosasa, T. S., Nakayama, R. T., Hale, R. W., Vaginal birth after cesarean section in Hawaii. Experience at Kapiolani Medical Center for Women and Children, Hawaii Medical Journal, 52, 38-42, 1993</td>
<td>No data for any of the relevant comparisons were reported</td>
</tr>
<tr>
<td>Cahill, A., Odibo, A., Allsworth, J., Macones, G., Frequent epidural dosing is a marker for impeding uterine rupture in patients attempting Vaginal Birth After Cesarean (VBAC), American Journal of Obstetrics and Gynecology, 201, S18, 2009</td>
<td>Conference abstract</td>
</tr>
<tr>
<td>Cahill,A.G., Odibo,A.O., Allsworth,J.E., Macones,G.A., Frequent epidural dosing as a marker for impeding uterine rupture in patients who attempt vaginal birth after cesarean delivery, American Journal of Obstetrics and Gynecology, 202, 355-355, 2010</td>
<td>The article examines the association between epidural dosing and the risk of uterine rupture in women who attempted VBAC. Not relevant comparison, that is, women with a uterine rupture versus those with no uterine rupture</td>
</tr>
<tr>
<td>Catling-Paull, C., Johnston, R., Ryan, C., Foureur, M. J., Homer, C. S., Clinical interventions that increase the uptake and success of vaginal birth after caesarean section: a systematic review, Journal of Advanced Nursing, 67, 1646-61, 2011</td>
<td>Relevant studies from this review were assessed separately for inclusion</td>
</tr>
<tr>
<td>Centre for Reviews and Dissemination, Trial of labour after Caesarean section in sub-Saharan Africa: a meta-analysis (Structured abstract), Database of Abstracts of Reviews of Effects, 2015</td>
<td>The review explicitly focuses on sub-Saharan Africa</td>
</tr>
<tr>
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<td>No relevant outcomes for the relevant comparison, that is, vaginal birth</td>
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### Study

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<td>versus an emergency CS, were reported</td>
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<td>The study examines factors that influence the risk of CS in women with induced labour</td>
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<td>A mixed population as not all women had a previous CS, some of them had a scarred uterus due to myomectomy. Also, labour was induced with oxytocin or prostaglandins</td>
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<td>The article describes factors associated with a successful VBAC. No data on emergency CS were reported</td>
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<td>No relevant outcomes for the comparison vaginal birth versus an emergency CS were reported</td>
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<td>The study examines whether CS performed at full dilatation is a risk factor for spontaneous preterm birth</td>
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<td>Not relevant comparison, that is, women with a previous CS and scar dehiscence and those with no scar dehiscence</td>
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<td>No comparative data between women who had a vaginal birth and those who had a CS were reported</td>
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<td>The article describes variables predicting VBAC</td>
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<td>Stronge, J. M., McQuillan, K., Robson, M., et al., Factors affecting mode of delivery in labour following a single previous birth by caesarean section, 16, 353-357, 1996</td>
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<td>Sudhof, L. S., Has, P., Rouse, D. J., Hughes, B. L., Choice of Trial of Labor after Cesarean and Association with Likelihood of Success, American Journal of Perinatology, 2018</td>
</tr>
<tr>
<td>Sudhof, L., Lopes, V., Rouse, D., Anderson, B., Choice of trial of labor after cesarean and association with likelihood of success, American Journal of Obstetrics and Gynecology, 212, S398-S399, 2015</td>
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### Study

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<tr>
<td>Thisted, Dorthe L. A., Mortensen, Laust H., Hvidman, Lone, Krebs, Lone, Operative technique at caesarean delivery and risk of complete uterine rupture in a subsequent trial of labour at term. A registry case-control study, PLoS ONE, 12, e0187850, 2017</td>
<td>No relevant data for the analgesia versus no analgesia comparison could be extracted</td>
</tr>
<tr>
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<td>Not relevant intervention, that is, use of prostaglandins</td>
</tr>
<tr>
<td>Veridiano, N. P., Thorner, N. S., Ducey, J., Vaginal delivery after cesarean section, International Journal of Gynecology and Obstetrics, 29, 307-311, 1989</td>
<td>No outcomes for the relevant comparison were reported</td>
</tr>
<tr>
<td>Vilchez, G., Dai, J., Bahado-Singh, R. O., Maulik, D., Sokol, R. J., Analysis of planned trial of labor vs. planned repeat cesarean and the effect of expectant management at each gestational age at term, American Journal of Obstetrics and Gynecology, 214, S211-S212</td>
<td>Conference abstract</td>
</tr>
<tr>
<td>Wagner, M., What every midwife should know about ACOG and VBAC. Critique of ACOG Practice Bulletin #5, July 1999, &quot;Vaginal birth after previous cesarean section&quot;, Midwifery Today with International Midwife, 41-3, 2001</td>
<td>Narrative article about guidelines on VBAC</td>
</tr>
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<td>Wali, A., Placenta previa/accreta: Repeat cesarean section regional vs. general, Journal of Anaesthesiology Clinical Pharmacology, 15, 510-523, 1999</td>
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</tr>
<tr>
<td>Warren, J. B., Hamilton, A., Clinical Inquiry: What's the best way to predict the success of a trial of labor after a previous C-section?, Journal of Family Practice, 64, E3-7, 2015</td>
<td>Description of scoring tools to predict the success of TOL after a previous CS</td>
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<tr>
<td>Weimar, C.H., Lim, A.C., Bots, M.L., Bruinse, H.W., Kwee, A., Risk factors for uterine rupture during a vaginal birth after one previous caesarean section: a case-control study, European Journal of Obstetrics, Gynecology, and Reproductive Biology, 151, 41-45, 2010</td>
<td>Not relevant comparison, that is, women with uterine rupture versus women with no uterine rupture</td>
</tr>
<tr>
<td>Weinstein, D., Benshushan, A., Tanos, V., Zilberstein, R., Rojansky, N., Predictive score for vaginal birth after cesarean section, American Journal of Obstetrics and Gynecology, 174, 192-198, 1996</td>
<td>No data for relevant comparison, that is, scoring system versus no scoring system used, were reported</td>
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### Study

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<td>Wu, Shao-Wen, Dian, He, Zhang, Wei-Yuan, Labor Onset, Oxytocin Use, and Epidural Anesthesia for Vaginal Birth after Cesarean Section and Associated Effects on Maternal and Neonatal Outcomes in a Tertiary Hospital in China: A Retrospective Study, Chinese medical journal, 131, 933-938, 2018</td>
<td>No relevant comparison was reported</td>
</tr>
<tr>
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<td>The article examines the association between previous CS and late (34-36 weeks) preterm birth</td>
</tr>
<tr>
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<td>Not relevant population as all participants had an elective CS</td>
</tr>
<tr>
<td>Zelop, C. M., Shipp, T. D., Repke, J. T., Cohen, A., Caughey, A. B., Lieberman, E., Uterine rupture during induced or augmented labor in gravid women with one prior cesarean delivery, American Journal of Obstetrics &amp; Gynecology, 181, 882-6, 1999</td>
<td>No results for the relevant comparison, that is, oxytocin versus no oxytocin, were reported</td>
</tr>
<tr>
<td>Zelop, C. M., Shipp, T. D., Repke, J. T., Cohen, A., Lieberman, E., Effect of previous vaginal delivery on the risk of uterine rupture during a subsequent trial of labor, American Journal of Obstetrics &amp; Gynecology, 183, 1184-6, 2000</td>
<td>Not relevant comparison, that is, women with and without previous vaginal birth</td>
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### Economic studies

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.
Appendix E – Clinical evidence tables

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full citation</strong></td>
<td>Brocks, C. O., Govindappagari, S., Gyanif-Bannerman, C., Outcomes of Operative Vaginal Delivery during Trial of Labor after Cesarean Delivery, American Journal of Perinatology, 2016</td>
<td><strong>Sample size</strong></td>
<td>N=5727 women with a previous caesarean section (CS) undergoing trial of labour (TOLAC) and fully dilated cervixes and spontaneous labour: n=5640/5727 had a vaginal birth, n=87/5727 had an emergency CS</td>
<td><strong>Interventions</strong></td>
<td>Emergency CS</td>
</tr>
<tr>
<td><strong>Characteristics</strong></td>
<td>Maternal age (average (SD)): vaginal birth (VB) group = 28.45 (SD not reported), emergency CS group = 29.16 (5.68). Obese: vaginal birth group = 47.8%, emergency CS group = 51.7%. Previous CS for failure to progress: vaginal birth</td>
<td><strong>Details</strong></td>
<td>This was a secondary analysis of the MFMU Network Cesarean Registry designed to consider perinatal outcomes in women undergoing operative vaginal birth with a prior uterine scar. The primary (parent) study was a 4-year prospective observational study that enrolled women from 19 academic medical centres in the USA between 1999 and 2002 to identify characteristics of women likely to have a successful vaginal birth after previous caesarean birth.</td>
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<tr>
<td><strong>Results</strong></td>
<td>For the woman Uterine rupture/dehiscence: emergency CS group = 5/87 (5.7%) vaginal birth group = 11/5640 (0.2%) Endometritis: emergency CS group = 6/87 (6.9%) vaginal birth group = 59/5640 (1%) Hysterectomy: emergency CS group = 0/87 vaginal birth group = 0/5640</td>
<td><strong>For the baby</strong> Perinatal mortality: emergency CS group = 0/87 (0.0%)</td>
<td><strong>Limitations</strong></td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as data were collected from a CS registry. The non-exposed group was drawn from the same database as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias (the study did not control for any factor for the relevant outcomes for this review).</td>
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Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Study details

<table>
<thead>
<tr>
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<tr>
<td>Aim of the study</td>
<td>To explore whether operative vaginal birth in the second stage of labour is associated with less maternal and neonatal morbidity than proceeding directly to labour followed by repeat CS</td>
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<tr>
<td>Study dates</td>
<td>Between 1999 and 2002</td>
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<tr>
<td>Source of funding</td>
<td>Assistance from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, the Maternal-Fetal Medicine Units (MFMU) Network, and the study Protocol Subcommittee acknowledged by the study authors</td>
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<tr>
<td>Inclusion criteria</td>
<td>Women from the Cesarean Registry with singleton, nonanomalous pregnancies attempting TOLAC that reached the second stage of labour with at least +2 station. Women with known low transverse scars were included, also women with an unknown scar type (these were assumed to be low transverse because these represent the majority of caesarean births)</td>
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<tr>
<td>Exclusion criteria</td>
<td>Women with prior classical, low vertical, J or T incisions were excluded,</td>
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- group = 27.5%, emergency CS group = 57.5%. n=3413 (61%) in VB group had previous VB, n=17 (19.5%) in emergency CS group had previous VB

- vaginal birth group = 0/5640 (0.0%)
- Hypoxic ischaemic encephalopathy: emergency CS group = 1/87 (1.15%)
- vaginal birth group = 1/5640 (0.02%)

Outcome: low risk of bias (outcomes were collected from the CS registry; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).

Other information
None
## Study details

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<td>also those with multiple prior incisions, those who gave birth before 34 or after 41 weeks of gestation</td>
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### Full citation
Carlsson, C., Nybell-Lindahl, G., Ingemarsson, I., Extradural block in patients who have previously undergone caesarean section, British Journal of Anaesthesia, 52, 827-30, 1980

### Sample size
N=119 women with previous CS (n=77 had extradural analgesia, n=42 had conventional analgesia)

### Characteristics
Maternal age (average (range)): epidural group = 29.6 (23-36), no epidural group = 28.3 (22-39).
Oxytocin was given to n=59 of the 77 women from the extradural analgesia group. Of these, labour was induced in n=25 and n=34 spontaneous labour was accelerated; n=68 (88%) women gave birth vaginally. Oxytocin was given to n=17 of the 42 women in the conventional analgesia group.

### Interventions
Extradural block

### Details
Extradural block was given to n=77 (65%) women and n=42 (35%) received ketobemidone 0.8-1.0 ml i.m. or nitrous oxide intermittently or both. Each CS was performed through a low transverse uterine incision. When the cervix was dilated to 4 cm, the extradural block was administered. The extradural space was entered with a Tuohy needle between L2-L3 or L3-L4, a catheter was inserted and advanced 4-5 cm. Bupivacaine 0.25% 6-8 ml was administered initially. When pain recurred, repeat doses were given. No vasopressor drugs were given but as a precaution against hypotension, an i.v. infusion of approximately 200 ml of buffered saline solution was administered.

### Results
For the woman
Emergency CS:
- extradural block group: spontaneous labour = 1/18 (5.5%), oxytocin stimulation = 8/59 (13.5%) conventional analgesia group:
- spontaneous labour = 3/25 (12%), oxytocin injection = 4/17 (23.5%)
Instrumental birth:
- forceps or vacuum extraction:
  - extradural block group: spontaneous labour = 5/18 (27.7%), oxytocin stimulation = 20/59 (33.9%) conventional analgesia group:
  - spontaneous labour = 3/25 (12%), oxytocin injection = 4/17 (23.5%)

### Limitations
Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale:
- Selection: high risk of bias (no clear description of the derivation of the exposed group; no clear description of the non-exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour).
- Comparability: high risk of bias (the study did not control for any factor and the description of the study population was minimal).
- Outcome: unclear risk of bias (it was not reported how outcomes were collected; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Study details
- **Participants**: was induced in n=4 and in n=13 spontaneous labour was accelerated; n=37 (88%) women gave birth vaginally. No previous vaginal birth (VB n=66/77 (86%) in extradural analgesia group, n=32/42 (76%) in no extradural group
- **Interventions**: heart rate was recorded by scalp electrode. Oxytocin was administered as an i.v. infusion using an IVAC 501 infusion pump
- **Methods**: Study dates Between January 1977 and June 1979
- **Outcomes and Results**: stimulation = 1/17 (5.9%) Scar dehiscence: extradural block group: spontaneous labour = 0/18, oxytocin stimulation = 2/59 (3.4%) conventional analgesia group: spontaneous labour = 0/25, oxytocin stimulation = 0/17
- **Comments**: None

### Study dates
- Between January 1977 and June 1979

### Source of funding
- Not reported

### Inclusion criteria
- Not reported

### Exclusion criteria
- Not reported

### Full citation
- Chelmow, D., Laros, R. K., Jr., Maternal and neonatal outcomes after oxytocin augmentation in patients undergoing a trial of labor after prior cesarean delivery, Obstetrics & Gynecology, 80, 966-71, 1992

### Sample size
- N=504 women with a previous CS undergoing TOLAC; n=62 were given oxytocin, n=442 were not given oxytocin

### Sample size
- N=504 women with a previous CS undergoing TOLAC; n=62 were given oxytocin, n=442 were not given oxytocin

### Characteristics
- No description of the study population was reported.

### Ref Id
- No description of the study population was reported.

### Interventions
- Use of oxytocin for the augmentation of labour

### Interventions
- Data were drawn from a database containing more than 300 items of information about each mother-baby pair cared for during birth for at the study author's institution. Intrapartum data were obtained at birth and the remainder of the maternal and neonatal data were extracted from antenatal records and hospital

### Details
- Data were drawn from a database containing more than 300 items of information about each mother-baby pair cared for during birth for at the study author's institution. Intrapartum data were obtained at birth and the remainder of the maternal and neonatal data were extracted from antenatal records and hospital

### Results
- For the woman:
  - Mortality: Oxytocin group = 0/62 No oxytocin group = 0/442
  - Uterine rupture: Oxytocin group = 0/62 No oxytocin group = 0/442
  - Hysterectomy: Oxytocin group = 0/62

### Limitations
- Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as hospital charts of all women who had TOLAC were reviewed. The non-exposed group was drawn from the same hospital as the
### Study details

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<td><strong>Country/ies where the study was carried out</strong></td>
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<tr>
<td><strong>Study type</strong></td>
<td>Retrospective cohort</td>
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<tr>
<td><strong>Aim of the study</strong></td>
<td>To examine the use of oxytocin and epidural anaesthesia in terms of maternal and neonatal outcomes in 504 women undergoing a trial of labour (TOLAC) after a previous CS</td>
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<tr>
<td><strong>Study dates</strong></td>
<td>Between November 1975 and July 1990</td>
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<td><strong>Source of funding</strong></td>
<td>Not reported</td>
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### Participants

- n=442 labours were not augmented with oxytocin, n=62 labours were augmented with oxytocin n=185 (37%) out of 504 had labour abnormalities such as prolonged latent phase, slow slope active phase, active phase arrest for the first stage and persistent occiput posterior, deep transverse arrest, arrest of descent and prolonged second stage; and n=62 (34%) out of 185 required oxytocin augmentation.
- n=291 (58%) women had a successful TOLAC. In the oxytocin group n=31/46 (67%) of women who gave birth vaginally had a spontaneous vaginal birth (VB), n=15/46 (33%) had an assisted VB; in the no oxytocin group n=194/245 (79%) had a spontaneous VB, n=51/245 (21%) had an assisted VB
- Birthweight was significantly different between the 2 groups: 3490 g in the non-oxytocin

### Interventions

Charts at the time of discharge from the hospital. Most women had either continuous or intermittent electronic fetal heart rate and external uterine activity monitoring or intermittent auscultatory fetal heart rate monitoring. Conduction anaesthesia was used by 57.5% of the women. The study authors reported that there was a set protocol for the management of dysfunctional labour in their institution. Typically, for first-stage abnormalities, the membranes would be ruptured artificially if they had not already ruptured. If this did not correct the dysfunction, oxytocin would be started at 0.5 mU/minute, increasing to 1 mU/minute after 40 minutes and then increasing by 1 mU/minute every 40 minutes until either the labour abnormality was corrected or 3 contractions were achieved in 10 minutes. If the cervix were favourable, oxytocin would be used to augment contractions. Second-stage abnormalities were sometimes managed by

### Methods

- No oxytocin group = 0/442
- Emergency CS: Oxytocin group = 16/62 (26%)
- No oxytocin group = 197/442 (45%)
- Operative birth: Oxytocin group = 15/62 (24%)
- No oxytocin group = 51/442 (11.5%)
- Febrile morbidity: Oxytocin group = 20/62 (32%)
- No oxytocin group = 110/442 (25%)

### Outcomes and Results

- Length of intra- and postpartum stay (weighted average, days)*:
  - Oxytocin group = 3.3
  - No oxytocin group = 1.2

*calculated by the NGA technical team

### Comments

- exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour).
- Comparability: high risk of bias (the study did not control for any factor and there was no description of the population).
- Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)

### Other information

None
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

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<td><strong>Inclusion criteria</strong></td>
<td>Singleton pregnancy, vertex presentation, gestational age at birth of at least 37 weeks, spontaneous labour</td>
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<td><strong>Exclusion criteria</strong></td>
<td>Women with known or suspected risk factors for an abnormal labour or poor maternal or perinatal outcome known before admission such as cancer, congenital heart disease, chronic hypertension, lupus erythematosus, antenatally diagnosed fetal anomalies or death, preeclampsia and chorioamnionitis. Also women with known prior classical CS, low vertical CS entering the active segment or unknown incision types with history</td>
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<td>group and 3613 g in the oxytocin group</td>
<td>Oxytocin augmentation if infrequent contractions were thought to contribute to the dysfunction</td>
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### Study details | Participants | Interventions | Methods | Outcomes and Results | Comments
---|---|---|---|---|---
Full citation  |  |  |  | of suggestive of a vertical incision |  
Ref Id | 652486
Country/ies where the study was carried out | India
Study type | Retrospective cohort
**Aim of the study** | To describe outcomes of childbirth in 1184 women with previous CS and to evaluate standardised, easily determined and compared with the Newcastle-Ottawa Quality Assessment Scale: Selection: high risk of bias (it was not reported how the cohort was derived; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour).
Comparability: unclear risk of bias (there was no description of the study population).
Outcome: high risk of bias (it was not reported how outcomes were collected; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)

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<tr>
<th><strong>Study type</strong></th>
<th><strong>Participants</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample size</strong></td>
<td>N=1184 women with a previous CS, n=590/1184 (49.8%) had a trial of labour (TOLAC) that resulted in n=452/590 vaginal births and n=138/590 emergency CSs; n=594/1184 (50.2%) had an elective CS</td>
</tr>
<tr>
<td><strong>Characteristics</strong></td>
<td>n=248/590 (42%) had a previous vaginal birth (VB) and n=342/590 (58%) did not have a previous VB</td>
</tr>
<tr>
<td><strong>Inclusion criteria</strong></td>
<td>Carefully screened uncomplicated pregnancies with non-recurrent indications for primary CS had a TOLAC. Women with a history of 2 or more CSs, previous classical CS, lie other than longitudinal in the current</td>
</tr>
<tr>
<td><strong>Interventions</strong></td>
<td>Emergency CS</td>
</tr>
<tr>
<td><strong>Details</strong></td>
<td>Women in whom TOLAC was unsuccessful due to various reasons (not reported) had an emergency CS. Second stage of labour was shortened by applying outlet forceps and the uterine cavity was explored whenever indicated. Pitocin-induced labour occurred in n=59/132 (44.7%) vaginal births and there were n=73/132 (55.3%) CSs (not reported whether emergency or elective CS)</td>
</tr>
<tr>
<td><strong>Results For the baby</strong></td>
<td></td>
</tr>
</tbody>
</table>
Perinatal mortality (includes stillbirths and neonatal deaths), corrected for congenital malformation, macerated stillbirths, cases of extreme prematurity: emergency CS group = 21.7/1000 (n=138 in this group, therefore the number of cases calculated* to be 3/138) vaginal birth group = 4.4/1000 (n=452 in this group, therefore the number of cases calculated* to be 2/452) elective CS group = 18.5/1000 |

*calculated by the NGA technical team

**Other information** | None

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Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study details</th>
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<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>easily recorded factors for selection of women for TOLAC</td>
<td>pregnancy, suspected case of macrosomia and past history of chronic endometritis with suspected poor wound healing had an elective CS</td>
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<tr>
<td>Study dates</td>
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<td></td>
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<tr>
<td>Between January 1979 and December 1983</td>
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<tr>
<td>Source of funding</td>
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<tr>
<td>Not reported</td>
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<td>Ref Id</td>
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<tr>
<td>60015</td>
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<tr>
<td>USA</td>
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<tr>
<td>Study type</td>
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<tr>
<td>Sample size</td>
<td>N=768 women with a previous CS; n=522/768 (68%) underwent a trial of labour (TOLAC) and of these n=344/522 had a vaginal birth and n=178/522 had an emergency CS; n=246/768 (32%) had an elective CS</td>
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<tr>
<td>Interventions</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Emergency CS</td>
<td></td>
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</tr>
<tr>
<td>Details</td>
<td>A retrospective review of all women who gave birth to their first live-born singleton baby by CS and gave birth in their subsequent pregnancy at the same hospital</td>
<td></td>
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</tr>
<tr>
<td>Results</td>
<td>For the woman Mortality: emergency CS group = 0/178 vaginal birth = 0/344 elective CS group = 0/246 Postpartum haemorrhage: emergency CS group = 2/178 (1.1%) vaginal birth = 3/344 (0.9%) elective CS group = not reported Infectious morbidity - chorioamnionitis: emergency CS group = 13/178 (7.3%)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Limitations</td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as all women who had TOLAC at the hospital had their maternal and infant charts reviewed; the non-exposed group was drawn from the same hospital as the exposed group. There is certainty that the outcomes of interest were not present at the start of the study given that the outcomes</td>
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</tbody>
</table>
# Intrapartum care for women with existing medical conditions or obstetric complications and their babies

## Evidence review for previous caesarean section

March 2019

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrospective cohort</td>
<td>85.2%, emergency CS group = 76.4% Oxytocin use: vaginal birth group = 49.7%, emergency CS group = 70.8% In those who achieved TOLAC, n=293/344 (85%) had spontaneous labour and in those who failed TOLAC n=136/178 (76%) had spontaneous labour</td>
<td>vaginal birth = 18/344 (5.2%) elective CS group = 0/246 Infectious morbidity - postpartum fewer: emergency CS group = 20/178 (11.2%) vaginal birth = 7/344 (2%) elective CS group = 6/246 (2.4%) Infectious morbidity - endometritis: emergency CS group = 17/178 (9.6%) vaginal birth = 7/344 (2%) elective CS group = 3/246 (2%)</td>
<td>could not occur before labour). Comparability: high risk of bias (the study did not control for any factor). Outcome: low risk of bias (outcomes were collected from hospital charts; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)</td>
<td></td>
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<tr>
<td><strong>Aim of the study</strong> To identify predictors of successful vaginal birth after caesarean section (VBAC) in women after 1 low transverse caesarean section (CS) and no other births and to assess perinatal morbidity associated with a failed VBAC attempt</td>
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<tr>
<td><strong>Study dates</strong> Between January 1989 and December 2001</td>
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<tr>
<td><strong>Source of funding</strong> The study was supported in part by a grant from the National Center for Research Resources (MOI-RR-000080)</td>
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<tr>
<td><strong>Inclusion criteria</strong> Women with a previous CS</td>
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<tr>
<td><strong>Exclusion criteria</strong> Women with an extension into the upper segment of the uterus or conversion to a T-incision at the time of low transverse CS and those with prior uterine surgery in which TOLAC was contraindicated. Also women who gave birth via an intervening viable pregnancy at another institution, those giving birth in the first or second</td>
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<tr>
<td>For the baby Mortality (birth to 28 days of life): emergency CS group = 0/178 vaginal birth = 0/344 elective CS group = 0/246 Birth asphyxia*: emergency CS group = 0/178 vaginal birth = 1/344 (0.3%)</td>
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</tbody>
</table>

*Other information None*
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Study details

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<tr>
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</thead>
<tbody>
<tr>
<td>pregnancy before 23 weeks of gestation, and those with multiple pregnancy in the subsequent pregnancy</td>
<td>elective CS group = 0/246Defined as acidaemia (umbilical cord arterial blood pH &lt;7.00), persistent low Apgar score and evidence of neonatal neurological sequelae</td>
<td></td>
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</tbody>
</table>

### Full citation

Flamm, B. L., Dunnett, C., Fischermann, E., Quilligan, E. J., Vaginal delivery following cesarean section: use of oxytocin augmentation and epidural anesthesia with internal tocodynamic and internal fetal monitoring, American Journal of Obstetrics & Gynecology, 148, 759-63, 1984

### Ref Id

652545

### Country/ies where the study was carried out

USA

### Study type

Sample size

N=230 women with a previous caesarean section (CS) undergoing TOLAC; n=181/230 (78.7%) had a vaginal birth and n=49/230 (21.3%) had an emergency CS

**Characteristics**

n=94/230 (41%) labours were induced or augmented with Pitocin (oxytocin); n=181/230 (78.7%) women had a vaginal birth; epidural anaesthesia was used by n=73 women

**Interventions**

Emergency CS

**Details**

N=230 women attempted TOLAC; n=128 at 1 Medical center (women there were predominantly indigent and Hispanic) and n=102 at another (women there mainly middle class and Caucasian)

**Results**

For the woman

**Mortality:**

emergency CS group = 0/49

vaginal birth group = 0/181

**Uterine rupture:**

emergency CS group = 0/49

vaginal birth group = 0/181

**Febrile morbidity:**

emergency CS group = 11/49 (22.4%)

vaginal birth group = 3/181 (1.7%)

**Anaemia requiring a blood transfusion:**

emergency CS group = 5/49 (10%)

vaginal birth group = 2/181 (1%)

**Hospital stay (days):**

Emergency CS group = 7.2 ± 2.5 days

vaginal birth group = 7.2 ± 2.5 days

**Limitations**

Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: high risk of bias (it was not reported how the cohort was derived; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias (the study did not control for any factor and there was minimal description of the study population). Outcome: high risk of bias (it was not reported how outcomes were collected; follow-up was long enough for outcomes to occur; data
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study details</th>
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<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrospective cohort</td>
<td>Inclusion criteria Not reported</td>
<td></td>
<td>Emergency CS group = 4.9</td>
<td>were presented for all women covered by the study</td>
<td></td>
</tr>
<tr>
<td>Aim of the study</td>
<td>Exclusion criteria Contraindications to TOLAC were prior uterine incision other than transverse or unknown uterine scar, multiple pregnancy, breech presentation, woman not interested in attempting TOLAC. More than 1 prior CS was a contraindication to TOLAC, however some exceptions were made. Cephalopelvic disproportion was not considered to be a contraindication to TOLAC</td>
<td></td>
<td>vaginal birth group = 2.3</td>
<td>Other information None</td>
<td></td>
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<tr>
<td>Study dates</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Between 1979 and 1982</td>
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<tr>
<td>Source of funding</td>
<td></td>
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<tr>
<td>Not reported</td>
<td></td>
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<tr>
<td>Sample size</td>
<td>Sample size N=7149 women undergoing TOLAC; among these n=4081 used an epidural and n=3068 did not use an epidural</td>
<td></td>
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<tr>
<td>Characteristics</td>
<td></td>
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</tr>
<tr>
<td>Interventions</td>
<td>Epidural use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Details</td>
<td>The study was conducted using a computerised medical records database at a single obstetric centre. Data on demographic and obstetric characteristics, the course of birth and any complications were obtained from the electronic database</td>
<td></td>
<td></td>
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<tr>
<td>Results</td>
<td>For the woman Emergency CS: epidural group = 356/4081 (8.7%) no epidural group = 361/3068 (11.8%) Instrumental birth: epidural group = 479/4081 (11.7)</td>
<td></td>
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</tr>
<tr>
<td>Limitations</td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: unclear risk of bias (although computerised medical records for all women who had TOLAC in a single obstetric centre were reviewed and used for data collection)</td>
<td></td>
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</tr>
</tbody>
</table>

### Study details

**cesarean (VBAC), Journal of Perinatal Medicine, 05, 05, 2017**

**Ref Id**
652580

**Country/ies where the study was carried out**
Israel

**Study type**
Retrospective cohort

**Aim of the study**
To evaluate the association between epidural analgesia and the outcomes of a trial of labour after caesarean section (TOLAC)

**Study dates**
Between 2006 and 2013

**Source of funding**

---

### Participants

| Jewish ethnicity: epidural group = 3837 (94%), no epidural group = 2804 (91.4%) |
| Maternal age (average (SD)): epidural group = 30.6 (5.1), no epidural group = 31.8 (5.5) |
| Gestational age at birth (weeks, average (SD)): epidural group = 39.5 (1.5), no epidural group = 39.4 (1.9) |
| Labour induction: epidural group = 272 (6%), no epidural group = 99 (3.2%) |
| Oxytocin use during labour: epidural group = 1018 (24.9%), no epidural group = 268 (8.7%) |
| More than 1 VBAC: epidural group = 2652 (65%), no epidural group = 2607 (85%) |
| Previous vaginal birth (VB): n=2652/4081 (65%) in epidural group, n=2542/3068 (83%) in no epidural group |
| Spontaneous VB: n=3246/4081 (80%) in epidural group, |

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### Interventions

Management software, which was updated during labour. The database was periodically audited by technical personnel to validate the information recorded. All women had complete data regarding outcomes targeted for reviewed as part of the study (because the data were retrieved from a clinical dataset which was updated during labour).

Epidural analgesia would be offered upon request. All women would sign an epidural analgesia informed consent form after receiving explanatory information from anaesthesia staff on duty.

Epidural analgesia would be performed in the L3–L5 lumbar area with a loss-of-resistance technique. The loading dose was 10 ml bupivacaine 0.1% solution with 2 μg/ml fentanyl and continued with patient-controlled analgesia. The patient-controlled analgesia protocol included a 10 ml/hour continuous infusion rate of bupivacaine/fentanyl solution (in a concentration similar to the loading dose), the lock-out

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### Methods

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### Outcomes and Results

| Uterine rupture*: epidural group = 12/4081 (0.3%) no epidural group = 6/3068 (0.2%) |
| Dehiscence**: epidural group = 6/4081 (0.1%) no epidural group = 3/3068 (0.1%) |
| Postpartum haemorrhage***: epidural group = 98/4081 (2.4%) no epidural group = 77/3068 (2.5%) |
| Prolonged hospitalisation****: epidural group = 616/4081 (15.1%) no epidural group = 448/3068 (14.6%) |

*the rupture includes the myometrium, peritoneum and fetal membranes
**the rupture of the myometrium at the previous scar with intact peritoneum and/or fetal membranes
***the rupture of the myometrium at the previous scar

---

### Comments

Analysis, the cohort is likely to be overrepresentative of women with more than 1 VBAC with no epidural as the group with no epidural included significantly more of women with these characteristics compared to those who had an epidural (85% versus 65%). The non-exposed group was drawn from the same hospital as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study.

Comparability: high risk of bias (the study did not control for any factor).

Outcome: low risk of bias (outcomes were collected from medical records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)

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### Other information

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Intrapartum care for women with existing medical conditions or obstetric complications and their babies

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>No specific funding was received to undertake the study</td>
<td>n=2622/3068 (86%) in no epidural group</td>
<td>interval was 15 minutes with a patient-controlled bolus injection of 5 ml as a rescue dose. No epidural would be offered/administered after full dilation</td>
<td><strong>blood loss of &gt;1000 ml within 24 hours of the birth and/or transfusion of blood products within 72 hours of the birth and/or a drop in haemoglobin concentration of &gt;3 g/dl</strong></td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

**Inclusion criteria**
All women with a single live fetus in cephalic presentation at 24–42 weeks of gestation and who were eligible for TOLAC under the departmental admission and management protocol. Eligibility criteria for TOLAC were: confirmation of a single previous low-transverse segment CS either by a written operative report or telephone confirmation performed and documented in the admission notes by the obstetrician overseeing the admission; estimated fetal weight <4200 g (either by clinical assessment or ultrasound examination within 1 week of admission); TOLAC was offered irrespective of the number of layers of the uterine closure at the CS.
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A diagnosis of dystocia of labour for the previous CS was not considered to be a contraindication for TOLAC</td>
<td>Emergency CS</td>
<td>Details</td>
<td>Results For the baby</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exclusion criteria</td>
<td>The study was conducted in the Department of Obstetrics and Gynaecology from November 2007 to October 2009. Oxytocin was used in few women for acceleration of</td>
<td>For the baby</td>
<td>Perinatal mortality: emergency CS group = 2/52 (3.8%) vaginal birth group = 1/76 (1%)</td>
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<tr>
<td></td>
<td>Women who gave birth via planned CS or at the time of admission were referred for CS without a TOLAC. Multiple pregnancies, home or ambulance births, non-vertex presentations, women who declined TOLAC, and women who were either not eligible for TOLAC or because of maternal and/or fetal complications at admission indicating the necessity of an emergency CS without TOLAC</td>
<td></td>
<td></td>
<td>Limitations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full citation</td>
<td>Sample size</td>
<td>Sample size</td>
<td>Gupta, P., Jahan, I., Jograjiya, G. R., Is vaginal delivery safe after previous lower segment caesarean section in developing</td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as</td>
</tr>
<tr>
<td></td>
<td>N=367 women with a previous caesarean section (CS); n=128/367 (35%) underwent TOLAC (n=76/128 had a vaginal birth, n=52/128 had an emergency CS),</td>
<td>Interventions</td>
<td>Details</td>
<td>Results For the baby</td>
<td></td>
</tr>
</tbody>
</table>

82
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study details</th>
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<th>Outcomes and Results</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>country?, Nigerian Medical Journal, 55, 260-5, 2014</td>
<td>n=239/367 (65%) had an elective CS</td>
<td>labour, with careful monitoring of fetal cardiac activity by cardiotocography (CTG), assessment of integrity of the previous CS scar clinically, and with careful vital monitoring</td>
<td>elective CS group = 0/242 Birth asphyxia: emergency CS group = 8/52 (15%) vaginal birth group = 4/76 (5%) elective CS group = 3/242 (1%)</td>
<td>women included in the study were recruited from a department of obstetrics and gynaecology. The non-exposed group was drawn from the same department as the exposed group. There is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour. Comparability: high risk of bias (the study did not control for any factor). Outcome: low risk of bias (outcomes were collected from the department of obstetrics and gynaecology; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)</td>
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<tr>
<td>Ref Id</td>
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<tr>
<td>Country/ies where the study was carried out</td>
<td>India</td>
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<tr>
<td>Study type</td>
<td>Prospective cohort</td>
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<tr>
<td>Aim of the study</td>
<td>To assess mode of birth in a trial of labour after caesarean section (TOLAC), incidence of successful vaginal birth and indications for a repeat CS</td>
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</tr>
<tr>
<td>Study dates</td>
<td>Between November 2007 and October 2009</td>
<td></td>
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<tr>
<td>Source of funding</td>
<td>None reported</td>
<td></td>
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<tr>
<td>Characteristics</td>
<td>85.65% of women were aged between 20 and 30 years; most of the women were from villages (85.8%); 65.12% of women had no prior antenatal booking (they were unbooked and were unsupervised prior to their admission for the birth); 52.3% of women were from lower socioeconomic status; 73.84% of women were at &gt;37 weeks of gestation and 7.6% were at &gt;40 weeks of gestation. Of those who achieved a vaginal birth (VB), n=40/76 (53%) gave birth without augmentation of labour</td>
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<tr>
<td>Inclusion criteria</td>
<td>Women with one previous lower segment CS, live pregnancy with haemoglobin ≥8 g/dl.</td>
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</tbody>
</table>
### Study details

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<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exclusion criteria</strong>&lt;br&gt;Women with gestational age &lt;34 weeks, intrauterine fetal death, live pregnancy with haemoglobin &lt;8 g/dl and other medical disorders</td>
<td></td>
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</tbody>
</table>

### Full citation

Hehir, M. P., Mackie, A., Robson, M. S., Simplified and standardized intrapartum management can yield high rates of successful VBAC in spontaneous labor, Journal of Maternal-Fetal & Neonatal Medicine, 30, 1504-1508, 2017

### Ref Id

652610

### Country/ies where the study was carried out

Ireland

### Study type

Retrospective cohort

### Sample size

N=4704 women with a previous CS. n=3071/4704 (65.3%) underwent TOLAC, n=1633/4705 (35%) had an elective CS. Analysis includes only women in spontaneous labour: n=3071 had TOLAC, of those n=2222 had spontaneous labour, of those n=1611/2222 had vaginal birth and n=611/2222 had an emergency CS

### Interventions

**Emergency CS**

- Women wishing to attempt TOLAC would receive standard antenatal care and be seen on a weekly basis from their 36th week of gestation.
- The history of their previous birth would be examined to ensure there were no absolute contraindications to TOLAC.
- Women with a medical indication for a repeat CS would be advised accordingly, however, those without a clear indication for repeat CS would be advised of the advantages of a vaginal birth. Spontaneous labour would be awaited and the women would be allowed to progress to 41 weeks of gestation

### Results

**For the woman**

- **Mortality:**
  - emergency CS group = 0/611 (0%)
  - vaginal birth group = 1/1611 (0.06%)
- **Postpartum haemorrhage***:
  - emergency CS group = 23/611 (3.8%)
  - vaginal birth group = 10/1611 (0.6%)
- **Hysterectomy**: emergency CS group = 2/611 (0.3%)
  - vaginal birth group = 2/1611 (0.1%)

### Limitations

Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as all women who had TOLAC and were in spontaneous labour in 1 hospital were included; the non-exposed group was drawn from the same hospital as the exposed group. There is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour).
## Study details

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
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<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim of the study</strong></td>
<td>CS in spontaneous labour at term (437 completed weeks of gestation). Maternal age (mean (SD)): vaginal birth group = 32.1 (4.6), emergency CS group = 32.8 (4.6) &gt;40 weeks of gestation: vaginal birth group = 23.1%, emergency CS group = 31.8% Oxytocin augmentation: vaginal birth group = 235/1611 (14.5%), emergency CS group = 251/611 (41%)</td>
<td></td>
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<td>Comparability: high risk of bias (the study did not control for any factor). Outcome: low risk of bias (outcomes were collected from the hospital; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)</td>
</tr>
<tr>
<td><strong>Study dates</strong></td>
<td>Inclusion criteria Only secundiparous women (women in their second pregnancy) with 1 previous CS in spontaneous labour at term (437 completed weeks of gestation)</td>
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<tr>
<td><strong>Source of funding</strong></td>
<td>Exclusion criteria Not reported</td>
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<td><strong>Full citation</strong></td>
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<td><strong>Sample size</strong></td>
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<td><strong>Interventions</strong></td>
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<tr>
<td>Emergency CS</td>
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</tbody>
</table>

Evidence review for previous caesarean section
March 2019
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study details</th>
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<tbody>
<tr>
<td>Kishor, T., Singh, C., Barman, S. D., Gupta, A. N., Study of vaginal delivery in patients with one previous lower segment caesarean section, Australian &amp; New Zealand Journal of Obstetrics &amp; Gynaecology, 26, 245-8, 1986</td>
<td>N=1315 women with a previous CS, n=685/1315 (52%) had a trial of labour after CS (TOLAC); of these n=473/685 had a vaginal birth and n=212/685 had an emergency CS</td>
<td>All births following CS in a hospital in India were studied. The records of women who attempted TOLAC were analysed. n=21% (144) women were given pitocin (oxytocin) for induction or augmentation of labour; n=541 women were not given pitocin</td>
<td>Stillbirth: emergency CS group = 0/212 vaginal birth group = 11/473 (2.3%)</td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as hospital records for all women who had TOLAC were reviewed; the non-exposed group was drawn from the same hospital as the exposed group. There is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias (the study did not control for any factor and there was no description of the study population). Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)</td>
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</tbody>
</table>

Ref Id
650101

Country/ies where the study was carried out
India

Study type
Retrospective cohort

Aim of the study
To evaluate practice related to a trial of vaginal labour for women with a previous lower-segment caesarean section (CS)

Study dates

Characteristics
Of those who achieved a vaginal birth (VB) n=395/473 (84%) had spontaneous labour; of those who did not achieve VB n=31/212 (15%) had spontaneous labour.

Of those who achieved VB n=120/473 (25%) had 1 previous CS and >=1 VB; of those who did not achieve VB n=42/212 (20%) had 1 previous CS and >=1 VB

Inclusion criteria
Criteria for TOLAC were: 1 prior lower-segment CS for a non-recurrent indication without any postoperative
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>From January 1980 to December 1984</td>
<td>morbidity, no adverse obstetric history, no evidence of cephalopelvic disproportion on clinical/radiographic assessment in the current pregnancy. Breech presentation per se was not considered to be a contraindication to TOLAC</td>
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<tr>
<td><strong>Source of funding</strong>&lt;br&gt;Not reported</td>
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<tr>
<td><strong>Exclusion criteria</strong>&lt;br&gt;Not reported</td>
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<tr>
<td><strong>Sample size</strong>&lt;br&gt;N=4569 women with a previous CS; n=3274/4569 (71%) attempted a trial of labour after caesarean section (TOLAC), of whom n=2487/3274 had a vaginal birth and n=787/3274 had an emergency CS; n=1295/4569 (28%) had an elective CS</td>
<td>Emergency CS. Oxytocin use</td>
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<tr>
<td><strong>Characteristics</strong>&lt;br&gt;No characteristics of the population reported in the article.</td>
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<tr>
<td><strong>Interventions</strong>&lt;br&gt;Thirty-six hospitals in the Netherlands participated in this study (38% of all hospitals in the Netherlands), proving representative sample of hospitals in the Netherlands. The following data were collected: number and order of previous CS and vaginal births, mode of birth in the current pregnancy, induction/augmentation of labour, presence of uterine rupture or scar dehiscence. Births &gt;=16 weeks of gestation were included</td>
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<tr>
<td><strong>Results</strong>&lt;br&gt;Comparison emergency CS versus vaginal birth For the woman Uterine rupture*: emergency CS group = 46/787 (5.8%) vaginal birth group = 2/2487 (0.08%) elective CS group = 1/1295 (0.08%) *defined as a separation of the uterine wall with clinical symptoms such as fetal heart abnormalities,</td>
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<tr>
<td><strong>Limitations</strong>&lt;br&gt;Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as data were collected from n=38 hospitals. The non-exposed group was drawn from the same hospitals as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes</td>
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<td><strong>Ref Id</strong>&lt;br&gt;52764</td>
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</table>
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

**Evidence review for previous caesarean section**

**March 2019**

<table>
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<tr>
<th>Study details</th>
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<tbody>
<tr>
<td><strong>Country/ies where the study was carried out</strong></td>
<td>Labour was induced (using oxytocin, prostaglandins, combination of the 2, sulproston, misoprostol, or other means) in n=682/3274 (20.8%) of women and augmented with oxytocin in n=536/3274 (16.4%) of women undergoing TOLAC. Of those attempting TOLAC, 92% had 1 previous CS followed by 1 previous vaginal birth (VB), and 73% had 1 previous VB followed by 1 previous CS</td>
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<td><strong>Study type</strong></td>
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<tr>
<td><strong>Prospective cohort</strong></td>
<td>Exclusion criteria</td>
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<tr>
<td><strong>Aim of the study</strong></td>
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<tr>
<td>To examine mode of birth, use of oxytocin or prostaglandins and occurrence of uterine rupture among women with a previous caesarean section (CS)</td>
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<td><strong>Study dates</strong></td>
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<tr>
<td>Between April 2002 and March 2003</td>
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<td><strong>Source of funding</strong></td>
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</tbody>
</table>

**Labor**

- abdominal pain,
- vaginal bleeding,
- signs of intra-abdominal bleeding,
- haematuria,
- loss of engagement of the presenting fetal part or maternal shock.

**Uterine dehiscence**:

- emergency CS group = 23/787 (2.9%)
- vaginal birth group = not reported
- elective CS group = 18/1295 (1.4%)

**defined as separation of the uterine wall without symptoms**

**Comparison oxytocin versus no oxytocin**

**For the woman**

- Uterine rupture*:
  - augmentation with oxytosin = 10/536 (1.9%)
  - no augmentation with oxytocin = 17/2056 (0.8%)

*defined as a separation of the abdominal wall without symptoms

**Other information**

- None

**Comments**

- could not occur before labour.
- Comparability: high risk of bias (the study did not control for any factor and there is no description of the population).
- Outcome: low risk of bias (outcomes were collected from hospitals; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section

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<td>uterus wall with clinical symptoms such as fetal heart abnormalities, abdominal pain, vaginal bleeding, signs of intra-abdominal bleeding, haematuria, loss of engagement of the presenting fetal part or maternal shock</td>
<td></td>
</tr>
<tr>
<td>Full citation</td>
<td>Meehan, F. P., Burke, G., Casey, C., Sheil, J. G., Delivery following cesarean section and perinatal mortality, American Journal of Perinatology, 6, 90-4, 1989</td>
<td></td>
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<tr>
<td>Ref Id</td>
<td>395923</td>
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<tr>
<td>Country/ies where the study was carried out</td>
<td>Ireland</td>
<td>Sample size</td>
<td>N=1498 women with a previous CS; n=844/1498 (56%) underwent a trial of labour after caesarean section (TOLAC) of whom n=702/844 had a vaginal birth and n=142/844 had an emergency CS; n=654/1498 (44%) had an elective CS. N=1479 babies were born to women with a previous CS (n=19 multiple pregnancies)</td>
<td>Interventions</td>
<td>Emergency CS</td>
</tr>
<tr>
<td>Study type</td>
<td>Retrospective cohort</td>
<td>Details</td>
<td>The records of all women with a scarred uterus who gave birth at a hospital in Ireland between 1 April 1972 and 31 March 1982 were reviewed using computerised analysis</td>
<td>Characteristics</td>
<td></td>
</tr>
</tbody>
</table>

*Cases where the number of cases was calculated to be lower than the observed number of cases are reported as such.

**This calculation was performed to estimate the number of cases based on the observed number of cases.
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

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<tr>
<td><strong>Aim of the study</strong></td>
<td>To present the perinatal mortality rate in a series of 1498 consecutive women who had at least 1 previous caesarean section and who gave birth at the Regional Hospital, Galway (RHG), Ireland over a 10-year period between 1972 and 1982.</td>
<td>There were n=285 (34%) women undergoing TOLAC with induction of labour and another 559 (66%) women experienced spontaneous onset of labour. In the latter group, 216 (39%) of labours were accelerated, 180 by artificial rupture of the membranes (ARM) alone, 42 by ARM plus oxytocin and 36 by oxytocin alone. In 3 women prostaglandin alone was used.</td>
<td><strong>Methods</strong></td>
<td>Babies babies were born in this group. *perinatal mortality refers to stillbirths and neonatal deaths occurring from 28 completed weeks of gestation to 4 weeks after birth. It includes babies weighing 500 g or less, with a gestational age of &gt;=28 weeks, showing signs of life but dying within 7 days. **calculated by the NGA technical team.</td>
<td>Comparability: high risk of bias (the study did not control for any factor and there was no description of the population). Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).</td>
</tr>
<tr>
<td><strong>Study dates</strong></td>
<td>Between 1972 and 1982</td>
<td><strong>Inclusion criteria</strong></td>
<td>Women with a previous CS</td>
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<tr>
<td><strong>Source of funding</strong></td>
<td>Not reported</td>
<td><strong>Exclusion criteria</strong></td>
<td>Not reported</td>
<td></td>
<td>Other information: None</td>
</tr>
<tr>
<td><strong>Full citation</strong></td>
<td>Miller, M., Leader, L. R., Vaginal delivery after caesarean section, Australian &amp; New Zealand Journal of Obstetrics &amp; Gynaecology</td>
<td><strong>Sample size</strong></td>
<td>N=318 women with a previous CS; n=125 (39%) had a trial of labour after caesarean section (TOLAC) of whom n=80/125 had a vaginal birth and n=45/125 had an Emergency CS</td>
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<tr>
<td><strong>Interventions</strong></td>
<td>Details</td>
<td>Participants were consecutive women with at least 1 previous CS giving birth at a hospital in Australia. The medical records of these women were examined and details of all previous pregnancies including</td>
<td><strong>Results</strong></td>
<td>For the woman Antibiotics postoperatively: emergency CS group = 15/45 (33%) vaginal birth group = not reported</td>
<td></td>
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</tbody>
</table>
| **Methods** | | | | | Limitations: Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as a
### Study details

**Gynaecology, 32, 213-6, 1992**  
Ref Id: 395948  
Country/ies where the study was carried out: Australia  
Study type: Prospective cohort  

### Aim of the study

To review the management for women with a previous caesarean section (CS) giving birth in a Sydney teaching hospital, to determine variables that may influence the likelihood of a vaginal birth and to assess perinatal and maternal morbidity associated with a vaginal birth after CS.

### Study dates

Consecutive prospective sample of women in a hospital was recruited and their hospital records were examined. The non-exposed group was drawn from the same hospital as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour.

### Study participants

Emergency CS; n=193/318 had an elective CS (61%)  
Maternal age (average, years (SD)): emergency CS = 31.13 (5.04), vaginal birth = 31.46 (4.71), elective CS = 32.09 (4.59)  
Gestation (average, weeks (SD)): emergency CS = 38.73 (2.73), vaginal birth = 38.28 (3.41), elective CS = 37.99 (1.98)  

### Interventions

The first CS, the conduct of labour in the current pregnancy and perinatal and maternal complications were collected. The indication for CS was taken to be the main indication listed in the operation notes and postpartum fever was defined as a temperature of 38°C or more on 2 occasions more than 24 hours apart.

### Study methods

The non-exposed group was drawn from the same hospital as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour.

### Outcomes and results

- **For the baby**  
  **Mortality:** emergency CS group = 1/45 (2.2%)  
  vaginal birth group = 1/80 (1.3%)  
  elective CS group = 1/193 (0.5%)  
  Stillbirth: emergency CS group = 0/45  
  vaginal birth group = 1/80 (1.3%)  
  elective CS group = 0/193

- **Hospital stay** (average, days (SD)): emergency CS group = 7.03 (1.57)  
  vaginal birth group = 4.92 (2.03)  
  elective CS group = 6.98 (2.05)

### Comments

Consecutive prospective sample of women in a hospital was recruited and their hospital records were examined. The non-exposed group was drawn from the same hospital as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour.

Comparability: high risk of bias (the study did not control for any factor).

Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all participants in the study).

Other information: None
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Study details

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<tr>
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<tr>
<td>Between July 1989 and June 1990</td>
<td>Exclusion criteria Not reported</td>
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<table>
<thead>
<tr>
<th>Full citation</th>
<th>Sample size</th>
<th>Interventions</th>
<th>Details</th>
<th>Results</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul, R. H., Phelan, J. P., Yeh, S. Y., Trial of labor in the patient with a prior cesarean birth, American Journal of Obstetrics and Gynecology, 151, 297-304, 1985</td>
<td>N=751 women with a previous caesarean section (CS) undergoing TOLAC of whom n=614/751 had a vaginal birth and n=137/751 had an emergency CS; an elective CS was performed in n=157/458 women who did not have TOLAC</td>
<td>Emergency CS</td>
<td>The medical centre in which the study was conducted served mainly women of a low socio-economic status who often present for care late in pregnancy. The study authors reported that previous medical records and historical information were often difficult to obtain</td>
<td>For the woman Dehiscence*: emergency CS group = 5/137 (3.6%) vaginal birth group = 11/614 (1.8%) *defined as a palpable and/or visualised uterine defect Febrile morbidity: emergency CS group = 37/137 (27%) vaginal birth group = 14/614 (2.3%) Hysterectomy: emergency CS group = 2/137 (1.5%) vaginal birth group = 5/614 (0.8%) Hospital stay (days): emergency CS group = 4.3 vaginal birth group = 2.3</td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as hospital charts of women who had TOLAC were reviewed. The non-exposed group was drawn from the same hospital as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias (the study did not control for any factor and there was no description of the population).</td>
</tr>
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</table>

#### Ref Id
652821

#### Country/ies where the study was carried out
USA

#### Study type
Prospective cohort

#### Aim of the study
To provide observations and outcome measures related to the first year of
### Study details

<table>
<thead>
<tr>
<th>Study dates</th>
<th>Sample size (N=51) women with a previous cesarean section (CS) undergoing a trial of labour after cesarean section (TOLAC) of whom n=31 (60.8%) had a vaginal birth and n=20 (39.2%) had an emergency CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of funding</td>
<td>Not reported</td>
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</tbody>
</table>

#### Exclusion criteria
- Women having a known previous classical uterine incision or having more than 1 previous CS;
- Women with multiple pregnancies;
- Women with a malpresentation other than breech

#### Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).

#### Other information
- None

---

### Interventions

**Emergency CS**
- The antenatal and hospital records of all women with a history of previous CS and who gave birth at the study author's hospital were reviewed

### Results

**For the woman**

- Postpartum haemorrhage (not defined): emergency CS group = 1/20 (5%) vaginal birth group = 4/31 (12.9%)

### Limitations

- Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale:
  - Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as hospital records of all women who had TOLAC were reviewed; the non-exposed group was drawn from the same hospital as the exposed group. There is certainty that the outcomes of interest were not present at the start of the study given that the outcomes...
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section
March 2019

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>scar; 49% received oxytocin; n=3 had a previous vaginal birth (VB) after CS (no further details reported)</td>
<td>Emergency CS</td>
<td></td>
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</tr>
<tr>
<td>Study type</td>
<td>Retrospective cohort</td>
<td></td>
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</tr>
<tr>
<td>Aim of the study</td>
<td>To determine the success and safety of vaginal birth after caesarean birth in a small rural hospital setting</td>
<td></td>
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</tr>
<tr>
<td>Study dates</td>
<td>Between October 1988 and January 1991</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of funding</td>
<td>Not reported</td>
<td></td>
<td></td>
<td></td>
<td>Other information</td>
</tr>
<tr>
<td>Full citation</td>
<td>Rietveld, A. L., Kok, N., Kazemier, B. M., de Groot, C. J., Teunissen, P. W., Trial of labor after cesarean: attempted operative vaginal delivery versus emergency repeat cesarean, a prospective national cohort</td>
<td></td>
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</tr>
<tr>
<td>Sample size</td>
<td>N=5246 undergoing an operative trial of labour after CS (TOLAC) of whom n=5027 had an operative vaginal birth and n=219 had an emergency CS</td>
<td>Interventions</td>
<td>Emergency CS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Details</td>
<td>The data were extracted from the Netherlands Perinatal Registry which contains information on pregnancies, births and neonatal (re)admissions until 28 days after the birth. The database consists of 3 different registries: the midwifery</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Results</td>
<td>For the woman</td>
<td></td>
<td></td>
<td></td>
<td>Limitations</td>
</tr>
<tr>
<td>Uterine rupture: emergency CS = 2/219 (0.9%) vaginal birth = 1/5027 (0.02%)</td>
<td>Adjusted odds ratio (95% CI) = 0.82 (0.66 to 1.02);</td>
<td></td>
<td></td>
<td></td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as data for women undergoing an operative</td>
</tr>
<tr>
<td>Limitations</td>
<td></td>
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</tr>
</tbody>
</table>
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Study details

**Participants**
- Maternal age (average) in the whole cohort was 32.2 years; in 26.3% the first birth was a CS
- All women had 1 previous CS only

**Inclusion criteria**
- Women with a history of CS who gave birth via a repeat CS or by operative vaginal birth in their second pregnancy. The definition of an emergency CS was a CS that was not elective or planned and which was undertaken for either a maternal or fetal indication. The definition of operative vaginal birth was birth by vacuum or forceps extraction. The Netherlands Perinatal Registry does not contain data on timing of intervention and so women in the first and second stage of labour were included in the emergency cesarean group

**Interventions**
- registry, the obstetrics registry and the neonatology registry. The registry covers approximately 95% of all births in the Netherlands.
- Induction of labour with attempted operative vaginal birth occurred in 48.2% of women

**Methods**
- adjusted for non-reassuring fetal status, macrosomia and ethnicity
- Postpartum haemorrhage*: emergency CS = 9/219 (4.1%) vaginal birth = 355/5027 (7.1%)

### Outcomes and Results

- Unadjusted odds ratio (95% CI) = 46.3 (4.18 to 512.8); numbers too small to calculate an adjusted odds ratio
- RR = 0.58 (0.3 to 1.11)**

*defined as blood loss of >1000ml

**Comments**
- vaginal birth were sampled from the Netherlands Perinatal Registry; the database consists of 3 different registries (the midwifery registry, the obstetrics registry and the neonatology registry) all of which are linked by a validated linkage procedure; the non-exposed group was drawn from the same registry as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias for postpartum haemorrhage as the study did not control for any factor for this outcome; low risk of bias for uterine rupture as the study did control for some factors for this outcome.
- Outcome: low risk of bias (outcomes were collected from the registry; follow-up was long enough for outcomes to occur; data were presented for all

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Study,


Ref Id
652865

Country/ies where the study was carried out
The Netherlands

Study type
Prospective cohort

Aim of the study
To compare maternal and neonatal outcomes from operative vaginal birth after caesarean section (CS) and emergency repeat CS

Study dates
Between 1 January 2000 and 31 December 2007
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Study details

<table>
<thead>
<tr>
<th>Source of funding</th>
<th>Evidence review for previous caesarean section March 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusion criteria</td>
<td>Women at &lt; 37 or &gt; 42 weeks of gestation at the start of labour in their current pregnancy, multiple pregnancy, non- cephalic (breech or transverse) presentation or antepartum fetal demise</td>
</tr>
<tr>
<td>Study details</td>
<td>Study details</td>
</tr>
<tr>
<td>Participants</td>
<td>Exclusion criteria</td>
</tr>
<tr>
<td>Interventions</td>
<td>Full citation</td>
</tr>
<tr>
<td>Methods</td>
<td>Sample size</td>
</tr>
<tr>
<td>Results</td>
<td>Ref Id 430754</td>
</tr>
<tr>
<td>Comments</td>
<td>Country/ies where the study was carried out USA</td>
</tr>
<tr>
<td>Study type</td>
<td>Study type</td>
</tr>
</tbody>
</table>

### Participants

N=237 women with a previous caesarean section (CS) who underwent TOLAC of whom n=87 (37%) received epidural analgesia and n=150 (63%) did not; of the 150 women in the no-epidural group n=46 received no labour analgesia and n=104 received narcotic-sedative combinations (no further details reported)

### Interventions

**Epidural analgesia**

Data for the study were obtained from perinatal data recorded on LLUMC's OBSTAT, a comprehensive, relational database including more than 90 categories of antenatal, intrapartum and neonatal data. The decision to administer epidural analgesia was made jointly by the obstetric and anesthesiology resident/attending staff on the basis of the woman's request and medical and obstetric indications. After preloading with 750 ml of Ringer's lactate, the epidural catheter was placed by the anesthesiology

### Methods

**Details**

For the woman

- Uterine rupture: epidural group = 0/87, no epidural group = 0/150
- Blood transfusion: epidural group = 1/87 (1%), no epidural group = 4/150 (3%)
- Scar dehiscence: epidural group = 4/87 (5%), no epidural group = 1/150 (1%)
- Emergency CS: epidural group = 11/87 (12%), no epidural group = 25/150 (17%)

### Results

Limitations

Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: unclear risk of bias (the cohort is likely to be somewhat representative of the average population as hospital charts of all women who had TOLAC were reviewed; the non-exposed group was drawn from the same hospital as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Although the study authors reported that

### Comments

wpmen covered by the study)

Other information None

None
### Study details

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrospective cohort</td>
<td>27.2 (4.4), no epidural group = 27.4 (5.0)</td>
<td>resident/attending staff at the L-2 to L-4 level. Following a test dose, a continuous infusion/intermittent bolus was given with either 0.125% or 0.25% bupivacaine. During the first stage of labour the analgesia was titrated to maternal comfort. If the woman's expulsive efforts were considered effective, the analgesia was continued through the second stage of labour; otherwise it was allowed to wear off. Electronic fetal monitoring was used for all labour.</td>
<td>Operative vaginal birth*: epidural group = 28/87 (37%) no epidural group = 29/150 (23%) Endometritis: epidural group = 6/87 (7%) no epidural group = 7/150 (5%) *expressed as a % of vaginal births</td>
<td>after excluding women who received oxytocin from the analysis, there was no difference in the operative vaginal birth rate between the epidural and the no epidural groups, they did not report how many women received oxytocin. Comparability: high risk of bias (the study did not control for any factor). Outcome: low risk of bias (outcomes were collected from the hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).</td>
<td></td>
</tr>
</tbody>
</table>

*Study dates*

Between October 1984 and April 1986

*Source of funding*

Not reported

### Study details

**Aim of the study**

To determine whether adverse outcomes are associated with use of epidural analgesia in trial of labour after caesarean section (TOLAC), whether use of epidural analgesia influences the chance of successful TOLAC, and what factors are associated with failed TOLAC when epidural analgesia is used.

**Study dates**

Between October 1984 and April 1986

**Source of funding**

Not reported

### Inclusion criteria

At least 1 previous low segment transverse CS

### Study details

**Participants**

27.2 (4.4), no epidural group = 27.4 (5.0) Gestational age (weeks (SD)): epidural group = 37.9 (4.2), no epidural group = 37.9 (4.4) Cervical examination on admission: dilation (cm (SD)): epidural group = 3 (1.5), no epidural group = 3.8 (2.5) Of those who received epidural analgesia and oxytocin n=18/40 (45%) had a spontaneous vaginal birth (VB) and with no oxytocin n=30/46 (65%) had a spontaneous VB. Of those who did not receive epidural analgesia but received oxytocin n=13/31 (42%) had a spontaneous VB and with no oxytocin n=82/118 (69%) had a spontaneous VB.

**Interventions**

resident/attending staff at the L-2 to L-4 level. Following a test dose, a continuous infusion/intermittent bolus was given with either 0.125% or 0.25% bupivacaine. During the first stage of labour the analgesia was titrated to maternal comfort. If the woman's expulsive efforts were considered effective, the analgesia was continued through the second stage of labour; otherwise it was allowed to wear off. Electronic fetal monitoring was used for all labour.

**Methods**

resident/attending staff at the L-2 to L-4 level. Following a test dose, a continuous infusion/intermittent bolus was given with either 0.125% or 0.25% bupivacaine. During the first stage of labour the analgesia was titrated to maternal comfort. If the woman's expulsive efforts were considered effective, the analgesia was continued through the second stage of labour; otherwise it was allowed to wear off. Electronic fetal monitoring was used for all labour.

**Outcomes and Results**

Operative vaginal birth*: epidural group = 28/87 (37%) no epidural group = 29/150 (23%) Endometritis: epidural group = 6/87 (7%) no epidural group = 7/150 (5%) *expressed as a % of vaginal births

**Comments**

after excluding women who received oxytocin from the analysis, there was no difference in the operative vaginal birth rate between the epidural and the no epidural groups, they did not report how many women received oxytocin. Comparability: high risk of bias (the study did not control for any factor). Outcome: low risk of bias (outcomes were collected from the hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).

Other information

None
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
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<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>with the woman requesting TOLAC</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Exclusion criteria</strong></td>
<td>Breech presentation, multiple pregnancy and obstetric contraindications to labour</td>
<td></td>
<td></td>
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</tbody>
</table>

### Full citation
Stovall, T. G., Shaver, D. C., Solomon, S. K., Anderson, G. D., Trial of labor in previous cesarean section patients, excluding classical cesarean sections, Obstetrics & Gynecology, 70, 713-7, 1987

**Ref Id**
652948

**Country/ies where the study was carried out**
USA

**Study type**
Prospective cohort

<table>
<thead>
<tr>
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<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample size</strong></td>
<td>N=396 women with a previous caesarean section (CS); n=272/396 (68.7%) underwent TOLAC of whom n=216/272 (79%) had a vaginal birth and n=56/272 (20%) had an emergency CS</td>
<td><strong>Interventions</strong></td>
<td>Emergency CS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inclusion criteria</strong></td>
<td>Women with a previous lower uterine segment transverse CS or previous</td>
<td><strong>Details</strong></td>
<td>Women who gave birth at a hospital in Tennessee, USA participated in the study. Women with a previous CS were screened in the antenatal clinic and instructed regarding risks and benefits of TOLAC. Dystocia as an indication for the primary CS was not considered a contraindication to TOLAC. Women who had an obstetric indication for induction were allowed to undergo TOLAC. Induction or augmentation with oxytocin was used when needed, after internal monitoring was initiated. Oxytocin was used in N=133, of whom n=35 (26%) were in the CS group and n=98 (74%)</td>
<td></td>
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</tr>
</tbody>
</table>

**Results**

For the woman
- Mortality: emergency CS = 0/56 vaginal birth = 0/216
- Uterine rupture*: emergency CS = 0/56 vaginal birth = 0/216

*defined as dehiscence that required a surgical intervention or blood component replacement

For the baby
- Mortality: emergency CS = 0/56 vaginal birth = 0/216

**Limitations**
Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale:
- Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as women attending an antenatal clinic were screened for inclusion in the study; the non-exposed group was drawn from the same clinic as the exposed group. There is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour).
- Comparability: high risk of bias (the study did not control for any factor and...
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Study details

**Aim of the study**
To determine maternal and neonatal outcomes of a trial of labour after caesarean section (TOLAC) and to examine whether in this context the use of epidural anaesthesia and oxytocin could be safely liberalised.

**Study dates**
During a 1-year period ending 31 July 1986.

**Source of funding**
Not reported.

### Participants

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>lower uterine segment vertical CS, regardless of number, were allowed to undergo TOLAC unless there was an obstetric contraindication.</td>
<td></td>
</tr>
<tr>
<td>Exclusion criteria Women who had a previous classical CS, a previous 'low vertical' CS in a premature pregnancy (such as a preterm breech birth), a lower uterine segment transverse scar or a lower uterine segment vertical scar, a failed TOLAC after the primary CS.</td>
<td></td>
</tr>
</tbody>
</table>

### Interventions

<table>
<thead>
<tr>
<th>Type of Procedure</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidural was used in N=153, of whom n=39 (26%) were in the CS group and n=114 (74%) were in the vaginal birth group. The type of uterine scar was documented from hospital records and previous operative reports.</td>
<td></td>
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</tbody>
</table>

### Methods

<table>
<thead>
<tr>
<th>Type of Procedure</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>were in the vaginal birth group.</td>
<td></td>
</tr>
</tbody>
</table>

### Outcomes and Results

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality:</td>
<td>emergency CS group = 0/35 vaginal birth group = 0/64 elective CS group = 0/31</td>
</tr>
<tr>
<td>Dehiscence:</td>
<td></td>
</tr>
</tbody>
</table>

### Comments

- There was no description of the population.
- Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).

### Other information

None.

### Full citation


### Sample size

N=130 women with a previous CS; n=99/130 (76%) had TOLAC of whom n=64/99 had a vaginal birth and n=35/99 had an emergency CS; n=31/130 (24%) had an elective CS.

### Limitations

Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as hospital records of all women who had TOLAC were in the vaginal birth group).
### Study details

<table>
<thead>
<tr>
<th>Country/ies where the study was carried out</th>
<th>Study type</th>
<th>Aim of the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>Retrospective cohort</td>
<td>To report on the safety of a trial of labour after caesarean section (TOLAC) and the use of oxytocin infusion in women with a previous transverse lower segment caesarean section (CS); also to consider factors that would influence outcomes and to examine associated maternal morbidities.</td>
</tr>
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</table>

#### Study dates

Between January and June 1989

#### Source of funding

Not reported

### Participants

<table>
<thead>
<tr>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous labour occurred in most women undergoing TOLAC. Oxytocin infusion</td>
</tr>
<tr>
<td>was given to induce and to augment labour in carefully selected cases. Vaginal</td>
</tr>
<tr>
<td>birth (VB) was successful in n=64/99 (65%). Of those who achieved a VB n=33/64</td>
</tr>
<tr>
<td>(52%) had a previous VB; of those who did not achieve a VB n=7/35 (20%) had</td>
</tr>
<tr>
<td>a previous VB. Spontaneous and not augmented labour: n=38/64 (59%) in the VB group, n=28/35 (80%) in the emergency CS group. Spontaneous and augmented labour: n=17/64 (27%) in the VB group, n=5/35 (9%) in the emergency CS group.</td>
</tr>
</tbody>
</table>

### Interventions

previous CSs; also women with multiple pregnancy and those whose pregnancies were complicated by breech presentation, macrosomia, a contracted pelvis, placenta praevia major, severe medical conditions and poor obstetric history

### Methods

### Outcomes and Results

- **Blood transfusion:**
  - emergency CS group = 8/35 (22.9%)
  - vaginal birth group = 4/64 (6.25%)
  - elective CS group = 2/31 (6.5%)

- **Febrile morbidity:**
  - emergency CS group = 6/35 (17%)
  - vaginal birth group = 1/64 (1.6%)
  - elective CS group = 3/31 (9.7%)

- **Endometritis:**
  - emergency CS group = 1/35 (2.9%)
  - vaginal birth group = 2/64 (3%)
  - elective CS group = 1/31 (3.2%)

- **Urinary tract infection:**
  - emergency CS group = 3/35 (8.6%)
  - vaginal birth group = 0/64
  - elective CS group = 0/31

### Comments

were reviewed; the non-exposed group was drawn from the same hospital as the exposed group. There is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour.

Comparability: high risk of bias (the study did not control for any factor).

Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study).

Other information

None
### Study details

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td><strong>Inclusion criteria</strong></td>
<td>Not reported</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>Exclusion criteria</strong></td>
<td>Not reported</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Sample size</strong></td>
<td>N=100 women with a previous caesarean section (CS); n=83/100 (83%) had a trial of labour after CS (TOLAC) of whom n=74/83 had a vaginal birth and n=9/83 had an emergency CS; n=17/100 (17%) had an elective CS</td>
<td></td>
<td></td>
<td>Hospital stay (days): emergency CS group = 6.9 vaginal birth group = 2.7 elective CS group = 6.7</td>
<td></td>
</tr>
<tr>
<td><strong>Interventions</strong></td>
<td>Emergency CS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Details</strong></td>
<td>During the 2-year period of the study author's residence at a hospital in the UK, 100 women with a previous CS gave birth. All the operations were of the lower segment type, the incision in the uterus was placed transversely</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Results</strong></td>
<td>For the woman Mortality: emergency CS group = 0/9 vaginal birth group = 0/74 elective CS = 0/17 Placenta praevia as an indication for primary CS emergency CS group = 0/9 vaginal birth group = 0/74 elective CS group = 3/17 (17.6%)</td>
<td></td>
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</tr>
<tr>
<td><strong>Limitations</strong></td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: high risk of bias (it was not reported how the cohort was derived; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias (the study did not control for any factor and there was no description of the population). Outcome: high risk of bias (it was not reported how outcomes were collected; follow-up was long enough for outcomes to occur; data were presented for all</td>
<td></td>
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### Study details

**Full citation**
Baker, K., Vaginal delivery after lower uterine cesarean section, Surgery, gynecology & obstetrics, 100, 690-6, 1955

**Ref Id**
755751

**Country/ies where the study was carried out**
UK

**Study type**
Retrospective cohort

**Aim of the study**
Not reported
### Study details

<table>
<thead>
<tr>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
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<tr>
<td><strong>Study dates</strong>&lt;br&gt;Not reported</td>
<td><strong>Exclusion criteria</strong>&lt;br&gt;Not reported</td>
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</table>

#### Source of funding
Not reported

#### Study dates
Not reported

#### Exclusion criteria
Not reported

#### Full citation

#### Ref Id
755754

#### Country/ies where the study was carried out
Jamaica

#### Study type
Retrospective cohort

#### Aim of the study

**Sample size**<br>N=423 women with a previous CS; n=243/423 (57.4%) had a trial of labour after CS (TOLAC) of whom n=171 had a vaginal birth and n=72 had an emergency CS; n=180/423 (42.6%) had an elective CS

**Inclusion criteria**<br>Only those women having their first CS and all subsequent pregnancies in the study author's hospital

**Interventions**<br>Emergency CS

**Details**<br>The records of all women undergoing CS in a university hospital in Jamaica were reviewed. In women who were not in established labour 6-12 hours after operative amniotomy, carefully titrated intravenous oxytocin was administered to start uterine contractions

**Results**<br>For the woman
- **Mortality:**
  - emergency CS group = 0/71
  - vaginal birth group = 0/171
  - elective CS group = 0/180
- **Uterine rupture:**
  - emergency CS group = 0/71
  - vaginal birth group = 0/171
  - elective CS group = 0/180
- **Placenta praevia as an indication for primary CS**
  - emergency CS group = 1/71 (1.4%)
  - vaginal birth group = 15/171 (8.8%)

**Limitations**
Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale:
- **Selection:** low risk of bias (the cohort is likely to be somewhat representative of the average population as hospital records of all women who had TOLAC were reviewed; the non-exposed group was drawn from the same hospital as the exposed group. There is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour).
- **Comparability:** high risk of bias (the study did not control for any factor and...
### Study details

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>To review statistics on pregnancies with previous caesarean section (CS) and to examine factors identifying women in whom vaginal birth would be feasible anatomically and without obstetric risk</td>
<td>were included; the previous CS was restricted to low segment transverse procedures</td>
<td>elective CS group = not reported</td>
<td>elective CS group = not reported</td>
<td></td>
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</tr>
<tr>
<td><strong>Exclusion criteria</strong></td>
<td>Women with a previous classic CS</td>
<td><strong>For the baby</strong></td>
<td>Perinatal mortality: emergency CS group = 0/71 vaginal birth group = 7/171 (4.1%) elective CS group = 2/180 (1.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Study dates</strong></td>
<td>Between 1960 and 1969</td>
<td><strong>Outcome:</strong> low risk of bias</td>
<td>outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study</td>
<td></td>
<td></td>
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<tr>
<td><strong>Source of funding</strong></td>
<td>Not reported</td>
<td><strong>Other information</strong></td>
<td>None</td>
<td></td>
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<tr>
<td><strong>Full citation</strong></td>
<td>Eglinton, G. S., Phelan, J. P., Yeh, S., Diaz, F. P., Wallace, T. M., Paul, R. H., Outcome of a trial of labor after prior cesarean delivery, Journal of Reproductive Medicine, 29, 3-8, 1984</td>
<td>None</td>
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<td></td>
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<tr>
<td><strong>Ref Id</strong></td>
<td>663409</td>
<td>None</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Sample size

Sample size: N=308 women with a previous caesarean section (CS) undergoing TOLAC of whom n=240/308 (78%) had a vaginal birth and n=68/308 (22%) had an emergency CS

### Characteristics

No description of the population was reported in the article

### Interventions

**Details**

At an estimated 34 weeks of gestation, women with previous CS were referred to the study author’s hospital for consideration of TOLAC. This large county hospital services an indigent and primarily Hispanic population; only women with defined risk factors would be referred to special high-risk antenatal clinics at the hospital. The data for the study were collected retrospectively

### Results

**For the woman**

Dehiscence*: emergency CS group = 4/68 (6%) vaginal birth group = 2/240 (0.8%)

*defined as defects that were palpable and/or visualised and required no intervention

Febrile morbidity**: emergency CS group = 27/68 (40%)

*Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as data were collected from hospital charts; the non-exposed group was drawn from the same data basis as the exposed group; there is certainty that the outcomes of interest were not present

Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale:

There was no description of the population. Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section
March 2019

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country/ies where the study was carried out</td>
<td>USA</td>
<td>Inclusion criteria</td>
<td>Women with a history of a single previous low transverse uterine incision</td>
<td>through individual chart reviews. The indications for use of oxytocin were the same as for women with an unscarred uterus</td>
<td>vaginal birth group = 6/240 (2.5%)</td>
</tr>
<tr>
<td>Study type</td>
<td>Retrospective cohort</td>
<td>Exclusion criteria</td>
<td>Women who had multiple prior incisions, an incision known to be vertical or an unknown type of prior incision</td>
<td></td>
<td><strong>defined as a temperature of 100.4 F orally on 2 separate occasions beyond the first 24 hours following surgery</strong></td>
</tr>
<tr>
<td>Aim of the study</td>
<td>To report the results of a system-wide policy in the study author’s hospital allowing a trial of labour after caesarean section (TOLAC) and vaginal birth in selected women with previous CS</td>
<td></td>
<td></td>
<td>Hysterectomy: emergency CS group = 0/68 vaginal birth group = 0/240</td>
<td></td>
</tr>
<tr>
<td>Study dates</td>
<td>During 1980</td>
<td>Study dates</td>
<td></td>
<td>Hospital stay (average (SD)): emergency CS group = 5 (1.4) vaginal birth group = 2.4 (1)</td>
<td></td>
</tr>
<tr>
<td>Source of funding</td>
<td>Not reported</td>
<td>Sample size</td>
<td>n=40 underwent TOLAC of whom n=32 had a vaginal birth and n=8 had an emergency caesarean</td>
<td>Interventions</td>
<td>Details</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emergency CS</td>
<td>The hospital charts of all women with a history of previous CS who gave birth at</td>
</tr>
<tr>
<td>Full citation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>For the woman</td>
</tr>
<tr>
<td>Hadley, C.B., Mennuti, M.T., Gabbe, S.G., An evaluation of the relative risks of a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Perinatal mortality: emergency CS group = 1/68 (1.5%) vaginal birth group = 7/240 (3%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Other information</td>
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</table>

Sample size: n=40 underwent TOLAC of whom n=32 had a vaginal birth and n=8 had an emergency caesarean.
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>trial of labor versus elective repeat cesarean section, American Journal of Perinatology, 3, 107-114, 1986</td>
<td>section (CS); n=35 had an elective CS</td>
<td></td>
<td>a University of Pennsylvania hospital were reviewed. Oxytocin was given to n=4/32 from the vaginal birth group and n=4/8 from the emergency CS group</td>
<td>vaginal birth group = 0/32 elective CS group = 0/35 Uterine rupture: emergency CS group = 0/8 vaginal birth group = 0/32 elective CS group = 0/35 Hysterectomy: emergency CS group = 0/8 vaginal birth group = 0/32 elective CS group = 0/35 Febrile morbidity Fever during labour: emergency CS group = 0/8 vaginal birth group = 2/32 (6%) elective CS group = 0/35 Postpartum endometritis: emergency CS group = 4/8 (50%) vaginal birth group = 2/32 (6%) elective CS group = 7/35 (20%)</td>
<td>Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as data were collected from hospital charts. The non-exposed group was drawn from the same hospital as the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias (the study did not control for any factor). Outcome: low risk of bias (outcomes were collected from hospital charts; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)</td>
</tr>
<tr>
<td>Ref Id</td>
<td>170563</td>
<td></td>
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<tr>
<td>Country/ies where the study was carried out</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study type</td>
<td>Retrospective cohort</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aim of the study</td>
<td>To report a retrospective experience of a trial of labour after caesarean section (TOLAC) over an 18-month period in a group of medically indigent women cared for at a large teaching institution</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion criteria</td>
<td>Women with no other medical/surgical complications of pregnancy, 1 previous low transverse CS, singleton fetus in vertex presentation, 37 weeks of gestation by clinical and/or ultrasound evaluation or fetal pulmonary maturity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characteristics</td>
<td>Maternal age (mean): vaginal birth = 23.7, emergency CS = 23.5, elective CS = 24.1 All women undergoing CS received prophylactic antibiotics consisting of 3 doses of a cephalosporin during and after the CS. Of those who achieved a vaginal birth (VB), n=23/32 (72%) had a spontaneous labour and n=9/32 (28%) had an assisted VB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Study details

<table>
<thead>
<tr>
<th>Source of funding</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not reported</td>
<td>confirmed analysis of amniotic fluid</td>
<td></td>
<td></td>
<td>Urinary tract infection: emergency CS group = 0/8 vaginal birth group = 1/32 (3%) elective CS group = 1/35 (2.8%) Wound infection: emergency CS group = 0/8 vaginal birth group = 0/32 elective CS group = 1/35 (2.8%) Hospital stay (mean): emergency CS group = 5.63 vaginal birth group = 3.13 elective CS group = 5.89</td>
<td></td>
</tr>
</tbody>
</table>

### Exclusion criteria

More than 1 previous CS, uterine scar other than low transverse, history of previous uterine surgery, twin pregnancy, active herpes genitalis, malpresentation of the fetus, inability to obtain adequate consent for TOLAC, fetal macrosomia, history of postpartum endometritis, abnormal prepartum testing or other (no further details reported)

### Sample size

N=216 women with a previous CS who underwent a trial of labour after CS (TOLAC) of whom n= 142/216 (66%) had a vaginal birth and n=74/216 (34%) had an emergency CS; n=388 had an elective CS

### Interventions

<table>
<thead>
<tr>
<th>Details</th>
<th>Results For the woman</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data for this study were collected from review of obstetric logs of a Medical Center Hospital in the USA. An intensive retrospective review of hospital and antenatal records was conducted for all women giving birth with a previous CS. No oxytocin was used for TOLAC</td>
<td>Febrile morbidity: Febrile, requiring antibiotics: emergency CS group = 5/74 (6.7%) vaginal birth group = 1/142 (0.7%) elective CS = 10/388 (2.5%) Wound infection:</td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: low risk of bias (the cohort is likely to be somewhat representative of the average population as data were collected from hospital charts; the non-exposed group was drawn from the same hospital as...</td>
</tr>
</tbody>
</table>

### Full citation


Ref Id

650068
### Study details

**Country/ies where the study was carried out**  
USA

**Study type**  
Retrospective cohort

**Aim of the study**  
To report a retrospective analysis of data collected over a 5-year period, involving a relatively homogeneous patient population from a single institution giving birth with a history of previous caesarean section (CS)

**Study dates**  
Between January 1978 and December 1982

**Source of funding**  
Not reported

### Participants

**Characteristics**
Women with a previous vaginal birth: vaginal birth group = 23/142, emergency CS group = 14/74  
Status on admission: latent phase: vaginal birth (VB) group = 56/142, emergency CS group = 84/74.  
Of those who achieved a VB, n=33/142 (23%) had a previous VB; of those who had an emergency CS, n=10/74 (14%) had a previous VB

**Inclusion criteria**
Women with a previous CS

**Exclusion criteria**
Women with a classic uterine incision or T incision had an elective CS

### Interventions

**Emergency CS**

### Methods

### Outcomes and Results

<table>
<thead>
<tr>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>emergency CS group = 2/74 (2.7%)</td>
<td>the exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour).</td>
</tr>
<tr>
<td>vaginal birth group = 0/142</td>
<td></td>
</tr>
<tr>
<td>elective CS = 2/388 (0.5%)</td>
<td></td>
</tr>
<tr>
<td>Urinary tract infection: emergency CS group = 3/74 (4%)</td>
<td>Comparability: high risk of bias (the study did not control for any factor).</td>
</tr>
<tr>
<td>vaginal birth group = 3/142 (2.1%)</td>
<td>Outcome: low risk of bias (outcomes were collected from hospital charts; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)</td>
</tr>
<tr>
<td>elective CS = 7/388 (1.8%)</td>
<td></td>
</tr>
<tr>
<td>Hospital stay (SD): emergency CS group = 5.4 (2.6)</td>
<td></td>
</tr>
<tr>
<td>vaginal birth group = 2.9 (1.3)</td>
<td></td>
</tr>
<tr>
<td>elective CS = 5.4 (1.1)</td>
<td></td>
</tr>
</tbody>
</table>

### Full citation

**Sample size**

**Interventions**

**Details**

**Results**

**Limitations**

None
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meier, P. R., Porreco, R. P., Trial of labor following cesarean section: a two-year experience, 144, 671-8, 1982</td>
<td>N=207 women with a previous CS undergoing TOLAC of whom n=175/207 (84.5%) had a vaginal birth and n=32/207 (15.5%) had an emergency CS; n=62 women had an elective CS</td>
<td>The previous low-transverse uterine incision was documented by an operative note or by a telephone conversation with the Medical Records Department if the primary procedure was performed elsewhere. The use of oxytocin for induction or augmentation of labour was at the discretion of the managing physician, although its use was encouraged to follow traditional obstetric guidelines. Pitocin induction/augmentation was given to 34/175 (19%) women in the vaginal birth group. Women with more than 1 previous CS were not excluded a priori from a TOLAC if they fulfilled the other inclusion criteria</td>
<td>Dehiscence: emergency CS group = 1/32 (3%) vaginal birth group = 0/175 Endometritis: emergency CS group = 1/32 (3%) (no antibiotics prior surgery) vaginal birth group = 2/175 (1.1%) For the baby Stillbirth: emergency CS group = 0/32 vaginal birth group = 1/175 (0.6%)</td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: high risk of bias (no clear description of the derivation of the cohort; no clear description of the non-exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias (the study did not control for any factor and there is no description of the population). Outcome: high risk of bias (it was not reported how outcomes were collected; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study)</td>
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**Ref Id**
763739

**Country/ies where the study was carried out**
USA

**Study type**
Retrospective cohort

**Aim of the study**
To explore the effectiveness of obstetric management for most women with a previous caesarean section (CS) being a trial of labour after CS (TOLAC) with repeat CS reserved only for obstetric indications

**Characteristics**
The majority of patients in the hospital where the study was carried out were from middle- or upper-middle class income levels

**Inclusion criteria**
Women with a previous CS

**Exclusion criteria**
Women were excluded if they had any recurrent obstetric or medical reason requiring a repeat CS; no obvious cephalopelvic disproportion

**Study dates**

Intrapartum care for women with existing medical conditions or obstetric complications and their babies

Evidence review for previous caesarean section
March 2019

<table>
<thead>
<tr>
<th>Study details</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
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<td>Between January 1980 and December 1981</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Source of funding</td>
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<tr>
<td>Ref Id</td>
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<tr>
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<td></td>
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<td>Study type</td>
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<tr>
<td>Aim of the study</td>
<td>To add to previous observations and describe the study author’s experience caring for women with 2 previous</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Sample size</th>
<th>Interventions</th>
<th>Details</th>
<th>Results</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=1796 women with a previous CS undergoing TOLAC of whom n=1465/1796 (82%) had a vaginal birth and n=331/1796 (18%) had an emergency CS</td>
<td>Emergency CS</td>
<td>The study population consisted of women who gave birth at a hospital in Los Angeles, USA. Oxytocin was administered according to the American College of Obstetricians and Gynecologists' guidelines. Oxytocin was used for n=793/1796 (44%) of women undergoing TOLAC (for induction of labour in n=59 and augmentation of labour in n=734)</td>
<td>For the woman Dehiscence*: emergency CS group = 17/331 (5.1%) vaginal birth group = 22/1465 (1.5%) defined as scar separation that required no intervention Febrile morbidity: emergency CS group = 106/331 (32%) vaginal birth group = 53/1465 (3.6%) Hospital stay (average): emergency CS group = 4.2 vaginal birth group = 2.2</td>
<td>Limitations assessed with the Newcastle-Ottawa Quality Assessment Scale: Selection: high risk of bias (no clear description of the derivation of the cohort; no clear description of the non-exposed group; there is certainty that the outcomes of interest were not present at the start of the study given that the outcomes could not occur before labour). Comparability: high risk of bias (the study did not control for any factor and there was no description of the population). Outcome: high risk of bias (it was not reported how outcomes were collected; follow-up was long enough for outcomes to occur; data were presented for all</td>
</tr>
</tbody>
</table>
**Study details**

- **Participants**: Multiple pregnancy, known classical scar, or malpresentation
- **Interventions**: Emergency CS
- **Methods**: Labour and birth record books were used for the analysis. To identify vaginal birth after CS attempts that were not recorded in the primary record books, operating room record books for the same period were examined to identify all repeat CSs performed because of indications implying attempted vaginal birth. All inpatient hospital records of identified women were obtained from hospital archives and a chart review was performed to search for markers of maternal or fetal characteristics.

**Outcomes and Results**

- **Results**: Haemorrhage (during or after birth and requiring blood transfusion in the postpartum period): emergency CS group = 4/87 (4.6%) vaginal birth group = 4/137 (3%)

**Comments**

- women covered by the study)
- Other information
  - None

---

**Study dates**

Between July 1982 and June 1984

**Source of funding**

Not reported

**Full citation**


**Ref Id**

763743

**Country/ies where the study was carried out**

USA

**Study type**

Retrospective cohort
### Study details

<table>
<thead>
<tr>
<th>Aim of the study</th>
<th>Participants</th>
<th>Interventions</th>
<th>Methods</th>
<th>Outcomes and Results</th>
<th>Comments</th>
</tr>
</thead>
</table>
| To assess morbidity associated with attempted vaginal birth after caesarean section (CS) at a tertiary level military obstetric hospital | **Inclusion criteria**
Women with previous CS | morbidity that might be related to vaginal birth after CS | mor | **Outcome**
low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study) | Comparability: high risk of bias (the study did not control for any factor and there was no description of the population). Outcome: low risk of bias (outcomes were collected from hospital records; follow-up was long enough for outcomes to occur; data were presented for all women covered by the study) |

<table>
<thead>
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</tr>
</tbody>
</table>

**Inclusion criteria**
- Women with previous CS

**Exclusion criteria**
- Not reported

**Source of funding**
- None
Appendix F – Forest plots

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

No meta-analysis was undertaken for this review and so there are no forest plots.
Appendix G – GRADE tables

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

Table 3: Clinical evidence profile for oxytocin in the case of delay or suspected delay in labour versus no oxytocin, outcomes for the woman

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Oxytocin</th>
<th>No oxytocin</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Effect</th>
<th>Absolut</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine rupture</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (Chelmo w 1992)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/62 (0%)</td>
<td>0/442 (0%)</td>
<td>-</td>
<td>-</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
<td>CRITICAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (Kwee 2007)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious²</td>
<td>None</td>
<td>10/536 (1.9%)</td>
<td>17/2056 (0.83%)</td>
<td>RR 2.26 (1.04 to 4.9)</td>
<td>104 more per 10,000 (from 3 more to 322 more)</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
<td>CRITICAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Febrile morbidity</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1 (Chelmo w 1992)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious²</td>
<td>None</td>
<td>20/62 (32.3%)</td>
<td>110/442 (24.9%)</td>
<td>RR 1.3 (0.87 to 1.92)</td>
<td>75 more per 1000 (from 32 fewer to 322 more)</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
<td>CRITICAL</td>
<td></td>
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</tr>
</tbody>
</table>

Evidence review for previous caesarean section
March 2019
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Number of women</th>
<th>Effect</th>
<th>Relative (95% CI)</th>
<th>Absolutes</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of studies</td>
<td>Design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
<td>Imprecision</td>
<td>Other considerations</td>
<td>Oxytocin</td>
<td>No oxytocin</td>
<td></td>
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</tr>
<tr>
<td>Hysterectomy</td>
<td>1 (Chelmow 1992)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/62 (0%)</td>
<td>0/442 (0%)</td>
<td>-</td>
<td>-</td>
<td>⭐⭐⭐⭐ VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>Mortality</td>
<td>1 (Chelmow 1992)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/62 (0%)</td>
<td>0/442 (0%)</td>
<td>-</td>
<td>-</td>
<td>⭐⭐⭐⭐ VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>Emergency caesarean section</td>
<td>1 (Chelmow 1992)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious²</td>
<td>None</td>
<td>16/62 (25.8%)</td>
<td>197/442 (44.6%)</td>
<td>RR 0.58 (0.37 to 0.89)</td>
<td>187 fewer per 1000 (from 49 fewer to 281 fewer)</td>
<td>⭐⭐⭐⭐⭐ VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>Operative vaginal birth</td>
<td>1 (Chelmow 1992)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>15/62 (24.2%)</td>
<td>51/442 (11.5%)</td>
<td>RR 2.1 (1.26 to 3.49)</td>
<td>127 more per 1000 (from 30 more to)</td>
<td>⭐⭐⭐⭐⭐ VERY LOW</td>
<td>IMPORTANT</td>
</tr>
</tbody>
</table>
## Evidence review for previous caesarean section

March 2019

### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Quality assessment</th>
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<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Oxytocin</th>
<th>No oxytocin</th>
<th>Relative (95% CI)</th>
<th>Absolute (95% CI)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergence CS Versus continuation of labour</td>
<td>1 (Kwee 2007)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>119/536 (22.2%)</td>
<td>265/2056 (12.9%)</td>
<td>RR 1.72 (1.42 to 2.09)</td>
<td>93 more per 1000 (from 54 more to 140 more)</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
<td>IMPORTANT</td>
</tr>
</tbody>
</table>

**Quality of the evidence:**
- **1** The quality of the evidence was downgraded by 1 level due to high risk of comparability bias (the study did not control for any factor), no description of the population reported
- **2** The quality of the evidence was downgraded by 1 level because the 95% CI crosses 1 default MID threshold
- **a** The effect was not estimable because no standard deviation was reported

### Duration of intrapartum and postpartum stay

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of studies</th>
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<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Oxytocin</th>
<th>No oxytocin</th>
<th>Relative (95% CI)</th>
<th>Absolute (95% CI)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of intrapartum and postpartum stay</td>
<td>1 (Chelmo 1992)</td>
<td>Observational studies</td>
<td>Serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable²</td>
<td>None</td>
<td>Weighted average 3.3 days (n=62)</td>
<td>Weighted average 1.2 days (n=442)</td>
<td>-</td>
<td>-</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
<td>NOT IMPORTANT</td>
</tr>
</tbody>
</table>

**Quality of the evidence:**
- **1** The quality of the evidence was downgraded by 1 level due to high risk of comparability bias (the study did not control for any factor), no description of the population reported
- **2** The quality of the evidence was downgraded by 1 level because the 95% CI crosses 1 default MID threshold
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### Table 4: Clinical evidence profile for emergency caesarean section versus continuation of labour, outcomes for the woman

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of studies</th>
<th>Design</th>
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<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergence CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute (95% CI)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine rupture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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CI: confidence interval; RR: risk ratio

**Evidence review for previous caesarean section**

March 2019
## Quality assessment

<table>
<thead>
<tr>
<th>Number of studies</th>
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<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergenc y CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Flamm 1984)</td>
<td>Observation studies</td>
<td>Very serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/49 (0%)</td>
<td>0/181 (0%)</td>
<td>-</td>
<td>-</td>
<td>⬤⬤⬤⬤</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Hadley 1986)</td>
<td>Observation studies</td>
<td>Serious²</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/8 (0%)</td>
<td>0/32 (0%)</td>
<td>-</td>
<td>-</td>
<td>⬤⬤⬤⬤</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Morrow 1973)</td>
<td>Observation studies</td>
<td>Serious³</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/71 (0%)</td>
<td>0/171 (0%)</td>
<td>-</td>
<td>-</td>
<td>⬤⬤⬤⬤</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Rietveld 2015)</td>
<td>Observation studies</td>
<td>No serious risk of bias</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious⁴</td>
<td>None</td>
<td>2/219 (0.91%)</td>
<td>1/5027 (0.02%)</td>
<td>OR 0.82⁵ (0.66 to 1.02)</td>
<td>-</td>
<td>⬤⬤⬤⬤</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Stovall 1987)</td>
<td>Observation studies</td>
<td>Serious³</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/56 (0%)</td>
<td>0/216 (0%)</td>
<td>-</td>
<td>-</td>
<td>⬤⬤⬤⬤</td>
<td>VERY LOW</td>
</tr>
</tbody>
</table>

### Uterine rupture

<table>
<thead>
<tr>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergenc y CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Kwee 2007)</td>
<td>Observation studies</td>
<td>Serious³</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>46/787 (5.8%)</td>
<td>2/2487 (0.08%)</td>
<td>RR 72.68 (17.68 to 298.73)</td>
<td>58 more per 1000 (from 13 more to</td>
<td>⬤⬤⬤⬤</td>
</tr>
</tbody>
</table>

**Evidence review for previous caesarean section**
March 2019
### Quality assessment

<table>
<thead>
<tr>
<th>Number of studies</th>
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<th>Indirectness</th>
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<th>Other considerations</th>
<th>Emergence CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Effect</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Eglinton 1984)</td>
<td>Observation studies</td>
<td>Serious 3</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>4/68 (5.9%)</td>
<td>2/240 (0.83%)</td>
<td>RR 7.06 (1.32 to 37.72)</td>
<td>50 more per 1000 (from 3 more to 306 more)</td>
<td>⊕ ⊝ ⊝</td>
<td>VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>1 (Lai 1993)</td>
<td>Observation studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious*</td>
<td>None</td>
<td>1/35 (2.9%)</td>
<td>0/64 (0%)</td>
<td>RR 5.42 (0.23 to 129.55)</td>
<td>-</td>
<td>⊕ ⊝ ⊝</td>
<td>VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>1 (Meier 1982)</td>
<td>Observation studies</td>
<td>Very serious 6</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious*</td>
<td>None</td>
<td>1/32 (3.1%)</td>
<td>0/175 (0%)</td>
<td>RR 16.00 (0.67 to 384.34)</td>
<td>-</td>
<td>⊕ ⊝ ⊝</td>
<td>VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>1 (Paul 1985)</td>
<td>Observation studies</td>
<td>Serious 3</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious*</td>
<td>None</td>
<td>5/137 (3.6%)</td>
<td>11/614 (1.8%)</td>
<td>RR 2.04 (0.72 to 5.77)</td>
<td>19 more per 1000 (from 5 fewer to 85 more)</td>
<td>⊕ ⊝ ⊝</td>
<td>VERY LOW</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

*Dehiscence

Evidence review for previous caesarean section
March 2019
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

**Evidence review for previous caesarean section**

March 2019

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of women</th>
<th>Effect</th>
<th>Absolu (95% CI)</th>
<th>Quality</th>
<th>Importanc</th>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsisten cy</th>
<th>Indirectne ss</th>
<th>Imprecisi on</th>
<th>Other considera tions</th>
<th>Emergen cy CS</th>
<th>Vaginal birth</th>
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<tbody>
<tr>
<td>Dehiscence&lt;sup&gt;4&lt;/sup&gt;</td>
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<tr>
<td>1 (Phelan 1987)</td>
<td>Observation al studies</td>
<td>Very serious&lt;sup&gt;6&lt;/sup&gt;</td>
<td>No serious inconsistenc y</td>
<td>No serious indirectnes s</td>
<td>No serious imprecisio n</td>
<td>None</td>
<td>17/331 (5.1%)</td>
<td>22/1465 (1.5%)</td>
<td>RR 3.42 (1.84 to 6.37)</td>
<td>36 more per 1000 (from 13 more to 81 more)</td>
<td>⊕⊝⊝ ⊝ VERY LOW</td>
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<tr>
<td>Uterine rupture or dehiscence</td>
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<tr>
<td>1 (Brock 2016)</td>
<td>Observation al studies</td>
<td>Serious&lt;sup&gt;7&lt;/sup&gt;</td>
<td>No serious inconsistenc y</td>
<td>No serious indirectnes s</td>
<td>No serious imprecisio n</td>
<td>None</td>
<td>5/87 (5.7%)</td>
<td>11/5640 (0.2%)</td>
<td>RR 29.47 (10.46 to 83.01)</td>
<td>56 more per 1000 (from 18 more to 160 more)</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td></td>
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<tr>
<td>Postpartum haemorrhage</td>
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</tr>
<tr>
<td>1 (Durnwald 2004)</td>
<td>Observation al studies</td>
<td>Serious&lt;sup&gt;2&lt;/sup&gt;</td>
<td>No serious inconsistenc y</td>
<td>No serious indirectnes s</td>
<td>Very serious&lt;sup&gt;5&lt;/sup&gt;</td>
<td>None</td>
<td>2/178 (1.1%)</td>
<td>3/344 (0.87%)</td>
<td>RR 1.29 (0.22 to 7.64)</td>
<td>3 more per 1000 (from 7 fewer to 58 more)</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
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## Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Quality assessment

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<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
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</thead>
<tbody>
<tr>
<td>1 (Raynor 1993)</td>
<td>Observational studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious&lt;sup&gt;5&lt;/sup&gt;</td>
<td>None</td>
<td>1/20 (5%)</td>
<td>4/31 (12.9%)</td>
<td>RR 0.39 (0.05 to 3.22)</td>
<td>79 fewer per 1000 (from 123 fewer to 286 more)</td>
<td>⊕⊕⊕</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>1 (Hehir 2017)</td>
<td>Observational studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>23/611 (3.8%)</td>
<td>10/1611 (0.62%)</td>
<td>RR 6.06 (2.9 to 12.67)</td>
<td>31 more per 1000 (from 12 more to 72 more)</td>
<td>⊕⊕⊕</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>1 (Rietveld 2015)</td>
<td>Observational studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious&lt;sup&gt;4&lt;/sup&gt;</td>
<td>None</td>
<td>9/219 (4.1%)</td>
<td>355/5027 (7.1%)</td>
<td>RR 0.58 (0.3 to 1.11)</td>
<td>30 fewer per 1000 (from 49 fewer to 8 more)</td>
<td>⊕⊕⊕</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

### Evidence review for previous caesarean section

March 2019
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

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<tr>
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<th>Quality</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Postpartum haemorrhage</strong>&lt;sup&gt;f&lt;/sup&gt;</td>
<td></td>
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</tr>
<tr>
<td>1 (Yetman 1989)</td>
<td>Observational studies</td>
<td>Serious&lt;sup&gt;3&lt;/sup&gt;</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious&lt;sup&gt;5&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Blood transfusion</strong></td>
<td></td>
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</tr>
<tr>
<td>1 (Flam 1984)</td>
<td>Observational studies</td>
<td>Very serious&lt;sup&gt;1&lt;/sup&gt;</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
</tr>
<tr>
<td>1 (Lai 1993)</td>
<td>Observational studies</td>
<td>Serious&lt;sup&gt;2&lt;/sup&gt;</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
### Quality assessment

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of studies</th>
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<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergent CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Febrile morbidity$^a$</td>
<td>1 (Eglinton 1984)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>Serious$^b$</td>
<td>No serious imprecision</td>
<td>None</td>
<td>27/68 (39.7%)</td>
<td>6/240 (2.5%)</td>
<td>RR 15.88 (6.84 to 36.89)</td>
<td>372 more per 1000 (from 146 more to 897 more)</td>
<td>⊕⊕⊕ ⊝</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>Febrile morbidity</td>
<td>1 (Flamm 1984)</td>
<td>Observational studies</td>
<td>Very serious</td>
<td>No serious inconsistency</td>
<td>Serious$^b$</td>
<td>No serious imprecision</td>
<td>None</td>
<td>11/49 (22.4%)</td>
<td>3/181 (1.7%)</td>
<td>RR 13.54 (3.93 to 46.66)</td>
<td>208 more per 1000 (from 49 more to 757 more)</td>
<td>⊕⊕⊕ ⊝</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>Febrile morbidity</td>
<td>1 (Hadley 1986)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>Serious$^b$</td>
<td>Very serious$^5$</td>
<td>None</td>
<td>0/8 (0%)</td>
<td>2/32 (6.3%)</td>
<td>RR 0.73 (0.04 to 13.95)</td>
<td>17 fewer per 1000 (from 60 fewer to 809 more)</td>
<td>⊕⊕⊕ ⊝</td>
<td>VERY LOW</td>
</tr>
</tbody>
</table>

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Evidence review for previous caesarean section
March 2019
## Quality assessment

<table>
<thead>
<tr>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergence CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute Risk</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Lai 1993)</td>
<td>Observational studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>Serious 6</td>
<td>No serious imprecision</td>
<td>None</td>
<td>6/35 (17.1%)</td>
<td>1/64 (1.6%)</td>
<td>RR 10.97 (1.38 to 87.52)</td>
<td>156 more per 1000 (from 6 more to 1000 more)</td>
<td>⊗ ⊗ ⊗ ⊗</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Paul 1985)</td>
<td>Observational studies</td>
<td>Serious 3</td>
<td>No serious inconsistency</td>
<td>Serious 6</td>
<td>No serious imprecision</td>
<td>None</td>
<td>37/137 (27%)</td>
<td>14/614 (2.3%)</td>
<td>RR 11.84 (6.59 to 21.29)</td>
<td>247 more per 1000 (from 127 more to 463 more)</td>
<td>⊗ ⊗ ⊗ ⊗</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Phelan 1987)</td>
<td>Observational studies</td>
<td>Very serious 6</td>
<td>No serious inconsistency</td>
<td>Serious 6</td>
<td>No serious imprecision</td>
<td>None</td>
<td>106/331 (32%)</td>
<td>53/1465 (3.6%)</td>
<td>RR 8.85 (6.51 to 12.04)</td>
<td>284 more per 1000 (from 199 more to 399 more)</td>
<td>⊗ ⊗ ⊗ ⊗</td>
<td>VERY LOW</td>
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</table>

### Febrile morbidity requiring antibiotics

Evidence review for previous caesarean section
March 2019
Quality assessment | Number of women | Effect | Quality | Importance |
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<tbody>
<tr>
<td><strong>Intrapartum care for women with existing medical conditions or obstetric complications and their babies</strong></td>
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</tr>
<tr>
<td><strong>Number of studies</strong></td>
<td><strong>Design</strong></td>
<td><strong>Risk of bias</strong></td>
<td><strong>Inconsistency</strong></td>
<td><strong>Indirectness</strong></td>
</tr>
<tr>
<td>1 (Jarrel 1985)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>Serious</td>
</tr>
<tr>
<td>1 (Brock 2016)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
</tr>
<tr>
<td>1 (Durnwald 2004)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
</tr>
<tr>
<td>Quality assessment</td>
<td>Number of women</td>
<td>Effect</td>
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<tr>
<td><strong>Intrapartum care for women with existing medical conditions or obstetric complications and their babies</strong></td>
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<tr>
<td><strong>Evidence review for previous caesarean section</strong></td>
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<tr>
<td><strong>March 2019</strong></td>
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<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergeny CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Hadley 1986)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>4/8 (50%)</td>
<td>2/32 (6.3%)</td>
<td>RR 8.0 (1.77 to 36.22)</td>
<td>438 more per 1000 (from 48 more to 1000 more)</td>
<td>⬤⬤⬤</td>
<td>VERY LOW</td>
</tr>
</tbody>
</table>

| 1 (Lai 1993)     | Observational studies | Serious | No serious inconsistency | No serious indirectness | Very serious 5 | None | 1/35 (2.9%) | 2/64 (3.1%) | RR 0.91 (0.09 to 9.73) | 3 fewer per 1000 (from 28 fewer to 273 more) | ⬤⬤⬤ | VERY LOW |

| 1 (Meier 1992)   | Observational studies | Very serious | No serious inconsistency | No serious indirectness | Very serious 5 | None | 1/32 (3.1%) | 2/175 (1.1%) | RR 2.73 (0.26 to 29.27) | 20 more per 1000 (from 8 fewer to 323 more) | ⬤⬤⬤ | VERY LOW |

| Chorioamnionitis | | |
| 1 (Durn) | Observational studies | Serious | No serious inconsistency | No serious indirectness | Very serious 5 | None | 13/178 (7.3%) | 18/344 (5.2%) | RR 1.4 (0.7 to 2.78) | 21 more per | ⬤⬤ | CRITICAL |

**Evidence review for previous caesarean section**
March 2019
<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of women</th>
<th>Effect</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numb er of studi es</td>
<td>Design</td>
<td>Risk of bias</td>
<td>Inconsisten cy</td>
<td>Indirectne ss</td>
</tr>
<tr>
<td>wald 2004)</td>
<td>1000</td>
<td>(from 16 fewer to 93 more)</td>
<td>VERY LOW</td>
<td></td>
</tr>
<tr>
<td>Postpartum fever</td>
<td>1 (Durn wald 2004)</td>
<td>Observation al studies</td>
<td>Serious 2</td>
<td>No serious inconsistenc y</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>1 (Hadl ey 1986)</td>
<td>Observation al studies</td>
<td>Serious 2</td>
<td>No serious inconsistenc y</td>
</tr>
<tr>
<td>1 (Jarrel l 1985)</td>
<td>Observation al studies</td>
<td>Serious 2</td>
<td>No serious inconsistenc y</td>
<td>No serious indirectnes s</td>
</tr>
</tbody>
</table>
## Quality assessment

<table>
<thead>
<tr>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergencies CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute (from 13 fewer to 175 more)</th>
<th>Quality</th>
<th>Importanc</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Lai 1993)</td>
<td>Observational studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious(^5)</td>
<td>None</td>
<td>3/35 (8.6%)</td>
<td>0/64 (0%)</td>
<td>RR 12.64 (0.67 to 237.9)</td>
<td>-(^1)</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>1 (Hadley 1986)</td>
<td>Observational studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/8 (0%)</td>
<td>0/32 (0%)</td>
<td>-</td>
<td>-</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>1 (Jarrell 1985)</td>
<td>Observational studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious(^5)</td>
<td>None</td>
<td>2/74 (2.7%)</td>
<td>0/142 (0%)</td>
<td>RR 9.83 (0.47 to 207.41)</td>
<td>-(^1)</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

### Wound infection

1. **1 (Lai 1993)**
   - **Observational studies**
   - **Serious 2**
   - **No serious inconsistency**
   - **No serious indirectness**
   - **Very serious\(^5\)**
   - **None**
   - **0/8 (0%)**
   - **0/32 (0%)**
   - **RR 12.64 (0.67 to 237.9)**
   - **-\(^1\)**
   - **⊕⊕⊕ ⊕ VERY LOW**
   - **CRITICAL**

### Placenta praevia as an indication for primary caesarean section

1. **1 (Lai 1993)**
   - **Observational studies**
   - **Very serious 9**
   - **No serious inconsistency**
   - **No serious indirectness**
   - **Not estimable due to 0 events**
   - **None**
   - **0/9 (0%)**
   - **0/74 (0%)**
   - **-**
   - **-\(^1\)**
   - **⊕⊕⊕ ⊕ VERY LOW**
   - **CRITICAL**

1. **1 (Morewood 1973)**
   - **Observational studies**
   - **Serious 3**
   - **No serious inconsistency**
   - **No serious indirectness**
   - **Serious 4**
   - **None**
   - **1/71 (1.4%)**
   - **15/171 (8.8%)**
   - **RR 0.16 (0.02 to 1.19)**
   - **74 fewer per 1000 (from)**
   - **⊕⊕⊕ ⊕ VERY LOW**
   - **CRITICAL**
<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergenecy CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hysterectomy</td>
<td></td>
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</tr>
<tr>
<td>1 (Brock 2016)</td>
<td>Observation</td>
<td>Serious</td>
<td>7</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/87 (0%)</td>
<td>0/5640 (0%)</td>
<td>-</td>
<td>-</td>
<td>⊕⊖⊖⊖ ⊕ ⊝ VERY LOW CRITICAL</td>
<td></td>
</tr>
<tr>
<td>1 (Eglinton 1984)</td>
<td>Observation</td>
<td>Serious</td>
<td>3</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/68 (0%)</td>
<td>0/240 (0%)</td>
<td>-</td>
<td>-</td>
<td>⊕⊖⊖⊖ ⊕ ⊝ VERY LOW CRITICAL</td>
<td></td>
</tr>
<tr>
<td>1 (Hadley 1986)</td>
<td>Observation</td>
<td>Serious</td>
<td>2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/8 (0%)</td>
<td>0/32 (0%)</td>
<td>-</td>
<td>-</td>
<td>⊕⊖⊖⊖ ⊕ ⊝ VERY LOW CRITICAL</td>
<td></td>
</tr>
<tr>
<td>1 (Hehir 2017)</td>
<td>Observation</td>
<td>Serious</td>
<td>2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious⁵</td>
<td>None</td>
<td>2/611 (0.33%)</td>
<td>2/1611 (0.12%)</td>
<td>RR 2.64 (0.37 to 18.68)</td>
<td>2 more per 1000 (from 1 fewer to 22 more)</td>
<td>⊕⊖⊖⊖ ⊕ ⊝ VERY LOW CRITICAL</td>
<td></td>
</tr>
<tr>
<td>1 (Paul 1985)</td>
<td>Observation</td>
<td>Serious</td>
<td>3</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious⁵</td>
<td>None</td>
<td>2/137 (1.5%)</td>
<td>5/614 (0.81%)</td>
<td>RR 1.79 (0.35 to 9.14)</td>
<td>6 more per 1000 (from 5</td>
<td>⊕⊖⊖⊖ ⊕ ⊝ VERY LOW CRITICAL</td>
<td></td>
</tr>
</tbody>
</table>
### Quality assessment

<table>
<thead>
<tr>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergancy CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
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<tr>
<td><strong>Mortality</strong></td>
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<tr>
<td>1 (Baker 1955)</td>
<td>Observation</td>
<td>Very serious</td>
<td>No serious</td>
<td>No serious</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/9 (0%)</td>
<td>0/74 (0%)</td>
<td>-</td>
<td>-</td>
<td>☀️☀️☀️</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Durnwald 2004)</td>
<td>Observation</td>
<td>Serious</td>
<td>No serious</td>
<td>No serious</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/178 (0%)</td>
<td>0/344 (0%)</td>
<td>-</td>
<td>-</td>
<td>☀️☀️☀️</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Flam 1984)</td>
<td>Observation</td>
<td>Very serious</td>
<td>No serious</td>
<td>No serious</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/49 (0%)</td>
<td>0/181 (0%)</td>
<td>-</td>
<td>-</td>
<td>☀️☀️☀️</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Hadhley 1986)</td>
<td>Observation</td>
<td>Serious</td>
<td>No serious</td>
<td>No serious</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/8 (0%)</td>
<td>0/32 (0%)</td>
<td>-</td>
<td>-</td>
<td>☀️☀️☀️</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>1 (Hehir 2017)</td>
<td>Observation</td>
<td>Serious</td>
<td>No serious</td>
<td>No serious</td>
<td>Very serious5</td>
<td>None</td>
<td>0/611 (0%)</td>
<td>1/1611 (0.06%)</td>
<td>RR 0.88 (0.04 to 21.52)</td>
<td>0 fewer per 1000 (from 1 fewer to 13 more)</td>
<td>☀️☀️☀️</td>
<td>VERY LOW</td>
</tr>
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<td>Number of women</td>
<td>Effect</td>
<td>Absolutes</td>
<td>Relative (95% CI)</td>
<td>Quality</td>
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<td>Evidence review for previous caesarean section March 2019</td>
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### Quality assessment

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<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Number of women</th>
<th>Effect</th>
<th>Absolutes</th>
<th>Relative (95% CI)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Lai 1993)</td>
<td>Observation studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/35 (0%)</td>
<td>0/64 (0%)</td>
<td>-</td>
<td>-</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>1 (Morewood 1973)</td>
<td>Observation studies</td>
<td>Serious 3</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/71 (0%)</td>
<td>0/171 (0%)</td>
<td>-</td>
<td>-</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>1 (Stovall 1987)</td>
<td>Observation studies</td>
<td>Serious 3</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/56 (0%)</td>
<td>0/216 (0%)</td>
<td>-</td>
<td>-</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td>IMPORTANT</td>
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### Duration of hospital stay

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<th>Design</th>
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<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Number of women</th>
<th>Effect</th>
<th>Absolutes</th>
<th>Relative (95% CI)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Eglinton 1984)</td>
<td>Observation studies</td>
<td>Serious 3</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>68</td>
<td>240</td>
<td>-</td>
<td>MD 2.60 higher (2.24 to 2.96 higher)</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td>NOT IMPORTANT</td>
</tr>
<tr>
<td>1 (Flamm 1984)</td>
<td>Observation studies</td>
<td>Very serious 1</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable</td>
<td>None</td>
<td>Average hospital stay 4.9 days (n=49)</td>
<td>Average hospital stay 2.3 days (n=181)</td>
<td>-</td>
<td>-</td>
<td>⊕⊕⊕ ⊕ VERY LOW</td>
<td>NOT IMPORTANT</td>
</tr>
<tr>
<td>1 (Hadl)</td>
<td>Observation studies</td>
<td>Serious 2</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable</td>
<td>None</td>
<td>Average hospital stay 5.6</td>
<td>Average hospital stay 3</td>
<td>-</td>
<td>-</td>
<td>⊕⊕⊕ ⊕ NOT IMPORTANT</td>
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<td>Number of studies</td>
<td>Design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
<td>Imprecision</td>
<td>Other considerations</td>
<td>Emergancy CS</td>
<td>Vaginal birth</td>
<td>Relative (95% CI)</td>
<td>Absolute</td>
<td>Effect</td>
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<tr>
<td>Numbey 1986)</td>
<td>Observation studies</td>
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<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
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<td>days (n=8)</td>
<td>days (n=32)</td>
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<td>1 (Jarrell 1985)</td>
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<td>74</td>
<td>142</td>
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<td>MD 2.50 higher (1.87 to 3.13 higher)</td>
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<td>1 (Lai 1993)</td>
<td>Observation studies</td>
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<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimableh</td>
<td>None</td>
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<td>Average hospital stay 6.9 days (n=35)</td>
<td>Average hospital stay 2.7 days (n=64)</td>
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<td>1 (Miller 1992)</td>
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<td>No serious indirectness</td>
<td>No serious imprecision</td>
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<td>45</td>
<td>80</td>
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<td>MD 2.11 higher (1.47 to 2.75 higher)</td>
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<td>1 (Paul 1985)</td>
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<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimableh</td>
<td>None</td>
<td></td>
<td>Average hospital stay 4.3 days (n=137)</td>
<td>Average hospital stay 2.3 days (n=614)</td>
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<tr>
<td>1 (Phelan 1987)</td>
<td>Observation studies</td>
<td>Very serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimableh</td>
<td>None</td>
<td></td>
<td>Average hospital stay 4.2 days (n=331)</td>
<td>Average hospital stay 2.2 days</td>
<td>-</td>
<td>-</td>
<td>⊕⊝⊝⊝</td>
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### Quality assessment

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<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergency CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
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<tr>
<td>(n=1465)</td>
<td>(n=1465)</td>
<td>(n=1465)</td>
<td>(n=1465)</td>
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<td>(n=1465)</td>
<td>(n=1465)</td>
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CI: confidence interval; CS: caesarean section; MD: mean difference; MID: minimally important difference; OR: odds ratio; RR: risk ratio

1. High risk of selection bias as it is not reported how the cohort was derived; high risk of comparability bias as the study did not control for any factor and there is a minimal description of the population reported; high risk of outcome selection bias as it is not reported how outcomes were collected
2. High risk of comparability bias as the study did not control for any factor
3. High risk of comparability bias as the study did not control for any factor and there is no description of the population
4. The quality of the evidence was downgraded by 1 level because the 95% CI crosses 1 default MID threshold
5. The quality of the evidence was downgraded by 2 levels because the 95% CI crosses both default MID thresholds
6. High risk of selection bias as it is not reported how the cohort was derived; high risk of comparability bias as the study did not control for any factor and there is no description of the population; high risk of outcome selection bias as it is not reported how outcomes were collected
7. High risk of comparability bias as the study did not control for any factor for outcomes relevant to the guideline review
8. The quality of the evidence was downgraded by 1 level for indirectness (requested by the committee) as fever in labour is not a good proxy for infectious morbidity, many fevers in labour are not necessarily due to an infection
9. High risk of selection bias as it is not reported how the cohort was derived; high risk of comparability bias as the study did not control for any factor and there is no description of the population; high risk of outcome selection bias as it is not reported how outcomes were collected

- Defined as a separation of the uterine wall with clinical symptoms, such as fetal heart abnormalities, abdominal pain, vaginal bleeding, signs of intra-abdominal bleeding, haematuria, loss of engagement of the presenting fetal part or maternal shock
- Defined as scar separation that required no intervention
- Defined as estimated blood loss >1000 ml
- Defined as during or after birth and requiring a transfusion in the postpartum period
- Defined as a temperature of 100.4 F orally on 2 separate occasions beyond the first 24 hours following surgery
- The effect was not estimable because no standard deviation was reported
- Absolute effect not estimable because 0 events in the control group
Table 5: Clinical evidence profile for emergency caesarean section versus continuation of labour, outcomes for the baby

<table>
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<tr>
<th>Quality assessment</th>
<th>Number of studies</th>
<th>Design</th>
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<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Number of babies</th>
<th>Effect</th>
<th>Absolutes</th>
<th>Quality</th>
<th>Importance</th>
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<tr>
<td>Hypoxic ischaemic encephalopathy</td>
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</tr>
<tr>
<td>1 (Brock 2016)</td>
<td>Observational studies</td>
<td>Seriouse s¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td></td>
<td>1/87 (1.1%)</td>
<td>1/5640 (0.02%)</td>
<td>RR 64.83 (4.09 to 1028.07)</td>
<td>11 more per 1000 (from 1 more to 182 more)</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
</tr>
<tr>
<td>Birth asphyxia¹</td>
<td></td>
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</tr>
<tr>
<td>1 (Durnwald 2004)</td>
<td>Observational studies</td>
<td>Seriouse s¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td></td>
<td>0/178 (0%)</td>
<td>1/344 (0.29%)</td>
<td>RR 0.64 (0.03 to 15.69)</td>
<td>1 fewer per 1000 (from 3 fewer to 43 more)</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
</tr>
<tr>
<td>Birth asphyxia</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1 (Gupta 2014)</td>
<td>Observational studies</td>
<td>Seriouse s¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious³</td>
<td>None</td>
<td></td>
<td>8/52 (15.4%)</td>
<td>4/76 (5.3%)</td>
<td>RR 2.92 (0.93 to 9.21)</td>
<td>101 more per 1000 (from 4 fewer to 432 more)</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
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</tbody>
</table>

Evidence review for previous caesarean section
March 2019

132
## Evidence review for previous caesarean section

March 2019

### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of babies</th>
<th>Effect</th>
<th>Absolutoe</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Relative (95% CI)</td>
<td>Quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absolute</td>
<td>Importance</td>
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#### Quality assessment

<table>
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<tr>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergency CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Stovall 1987)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/56 (0%)</td>
<td>0/216 (0%)</td>
<td>-</td>
<td>-</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>1 (Miller 1992)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>1/45 (2.2%)</td>
<td>1/80 (1.3%)</td>
<td>RR 1.78 (0.11 to 27.74)</td>
<td>10 more per 1000 (from 11 fewer to 334 more)</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>1 (Brock 2016)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/87 (0%)</td>
<td>0/5641 (0%)</td>
<td>-</td>
<td>-</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>1 (Eglington 1984)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>1/68 (1.5%)</td>
<td>7/240 (2.9%)</td>
<td>RR 0.5 (0.06 to 4.03)</td>
<td>15 fewer per 1000 (from 27 fewer to 88 more)</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>1 (Gupta 2014)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>2/52 (3.8%)</td>
<td>1/76 (1.3%)</td>
<td>RR 2.92 (0.27 to 31.41)</td>
<td>25 more per 1000 (from 10 fewer to 25 more)</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
<td>IMPORTANT</td>
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#### Perinatal mortality

<table>
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<th>Design</th>
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<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Emergence CS</th>
<th>Vaginal birth</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
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<tbody>
<tr>
<td>1 (Stovall 1987)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/56 (0%)</td>
<td>0/216 (0%)</td>
<td>-</td>
<td>-</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>1 (Miller 1992)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>1/45 (2.2%)</td>
<td>1/80 (1.3%)</td>
<td>RR 1.78 (0.11 to 27.74)</td>
<td>10 more per 1000 (from 11 fewer to 334 more)</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>1 (Brock 2016)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Not estimable due to 0 events</td>
<td>None</td>
<td>0/87 (0%)</td>
<td>0/5641 (0%)</td>
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<td>-</td>
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<tr>
<td>1 (Eglington 1984)</td>
<td>Observational studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>1/68 (1.5%)</td>
<td>7/240 (2.9%)</td>
<td>RR 0.5 (0.06 to 4.03)</td>
<td>15 fewer per 1000 (from 27 fewer to 88 more)</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
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<td>1 (Gupta 2014)</td>
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<td>Serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>2/52 (3.8%)</td>
<td>1/76 (1.3%)</td>
<td>RR 2.92 (0.27 to 31.41)</td>
<td>25 more per 1000 (from 10 fewer to 25 more)</td>
<td>🟢🟢🟢🟢 VERY LOW</td>
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<td>Other considerations</td>
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<td>Vaginal birth</td>
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<td>Quality</td>
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<tr>
<td>Perinatal mortality^b</td>
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<td>1 (Meehan 1989)</td>
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<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>13/144 (9%)</td>
<td>26/712 (3.7%)</td>
<td>RR 2.47 (1.30 to 4.69)</td>
<td>54 more per 1000 (from 11 more to 135 more)</td>
<td>⊗⊗⊗⊗ VERY LOW</td>
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<td>Perinatal mortality^c</td>
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<tr>
<td>1 (Dhall 1987)</td>
<td>Observational studies</td>
<td>Very serious^5</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious^3</td>
<td>None</td>
<td>3/138 (2.2%)</td>
<td>2/452 (0.44%)</td>
<td>RR 4.91 (0.83 to 29.10)</td>
<td>17 more per 1000 (from 1 fewer to 124 more)</td>
<td>⊗⊗⊗⊗ VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>Mortality (birth to 28 days of life)</td>
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## Intrapartum care for women with existing medical conditions or obstetric complications and their babies

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<tr>
<th>Quality assessment</th>
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<th>Effect</th>
<th>Absolut e</th>
<th>Relative (95% CI)</th>
<th>Other considerations</th>
<th>Indirectnes s</th>
<th>Inconsiste ncy</th>
<th>Risk of bias</th>
<th>Design</th>
<th>Number of studie s</th>
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<tbody>
<tr>
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<tr>
<td>1 (Kishor 1986)</td>
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<td>Serious</td>
<td>No serious inconsistency</td>
<td>Very serious</td>
<td>None</td>
<td>0/212 (0%)</td>
<td>11/473 (2.3%)</td>
<td>RR 0.1 (0.01 to 1.63)</td>
<td>21 fewer per 1000 (from 23 fewer to 15 more)</td>
<td>None</td>
</tr>
<tr>
<td>1 (Meier 1982)</td>
<td>Observatio nal studies</td>
<td>Very serious</td>
<td>No serious inconsistency</td>
<td>Very serious</td>
<td>None</td>
<td>0/32 (0%)</td>
<td>1/175 (0.57%)</td>
<td>RR 1.78 (0.07 to 42.7)</td>
<td>4 more per 1000 (from 5 fewer to 238 more)</td>
<td>None</td>
</tr>
<tr>
<td>1 (Miller 1992)</td>
<td>Observatio nal studies</td>
<td>Serious</td>
<td>No serious inconsistency</td>
<td>Very serious</td>
<td>None</td>
<td>0/45 (0%)</td>
<td>1/80 (1.3%)</td>
<td>RR 0.59 (0.02 to 14.12)</td>
<td>5 fewer per 1000 (from 12 fewer to 164 more)</td>
<td>None</td>
</tr>
</tbody>
</table>

CI: confidence interval; CS caesarean section; RR: risk ratio.
1 High risk of comparability bias as the study did not control for any factor
2 The quality of the evidence was downgraded by 2 levels because the 95% CI crosses both default MID thresholds

Evidence review for previous caesarean section
March 2019
3 The quality of the evidence was downgraded by 1 level because the 95% CI crosses 1 default MID threshold
4 High risk of comparability bias as the study did not control for any factor and there is no description of the population
5 High risk of selection bias as the study did not report how the cohort was derived, high risk of outcome bias as the study did not report how outcomes were collected, unclear risk of comparability bias as there is no description of the population
6 High risk of selection bias as there is no clear description of the derivation of the cohort and no clear description of the non-exposed group, high risk of comparability bias as the study did not control for any factor and there is no description of the population, high risk of outcome bias as it is not reported how outcomes were collected

a Defined as acidemia (umbilical cord arterial blood pH <7.00), persistent low Apgar score and evidence of neonatal neurological sequelae
b Defined as stillbirths and neonatal deaths occurring from 28 completed weeks of gestation to 4 weeks after the birth. Includes babies weighing 500 g or less, with a gestational age of >=28 weeks, showing signs of life but dying within 7 days
c Includes stillbirths and neonatal deaths, corrected for congenital malformation, macerated stillbirths, and cases of extreme prematurity

| Table 6: Clinical evidence profile for neuraxial analgesia versus no neuraxial analgesia, outcomes for the woman |
|---------------------------------------------------|-------------------|------------------|-----------------|------------------|-----------------|
| Quality assessment                               | Number of women   | Effect           | Quality          | Importance       |
| Number of studies, Design                        | Risk of bias      | Inconsistency    | Indirectness    | Imprecision      | Other conside  |
|                                                  |                   |                  |                 |                  | rations         |
| Neuraxial analgesia                              |                   |                  |                 |                  | Neuraxial analgesia |
| Neuraxial analgesia                              |                   |                  |                 |                  | No neuraxial analgesia |
| Relative (95% CI)                                | Absoluto          |                  |                 |                  |                 |
| RR 1.5 (0.56 to 4.0)                             | 1 more per 1000   |                  |                 |                  |                 |
| (from 1 fewer to 6 more)                         |                   |                  |                 |                  |                 |
| ⊕⊝⊝⊝⊝ VERY LOW                                   | CRITICAL          |                  |                 |                  |                 |
| Dehiscence                                       |                   |                  |                 |                  |                 |
| 1 (Grisaru - Granovsky 2017)                     | Observational     | Very serious ≥1  | No serious       | Very serious²   | None            |
| studies                                          |                   |                  | inconsistence   |                  |                 |
| 1 (Sakala 1990)                                  | Observational     | Serious ≥3       | No serious       | Not estimable   | None            |
| studies                                          |                   |                  | inconsistence   | due to 0 events |                 |
| 1 (Grisaru - Granovsky 2017)                     | Observational     | Very serious ≥1  | No serious       | Very serious²   | None            |
| studies                                          |                   |                  | inconsistence   |                  |                 |

Evidence review for previous caesarean section
March 2019
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

#### Quality assessment

<table>
<thead>
<tr>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Neuraxial analgesia</th>
<th>No neuraxial analgesia</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granovsky 2017</td>
<td>Observational studies</td>
<td>Serious³</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>4/87 (4.6%)</td>
<td>1/150 (0.67%)</td>
<td>RR 6.90 (0.78 to 60.72)</td>
<td>39 more per 1000 (from 1 fewer to 398 more)</td>
<td>fewer to 5 more</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
</tr>
<tr>
<td>1 (Sakala 1990)</td>
<td>Observational studies</td>
<td>Very serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>98/4081 (2.4%)</td>
<td>77/3068 (2.5%)</td>
<td>RR 0.96 (0.71 to 1.28)</td>
<td>1 fewer per 1000 (from 7 fewer to 7 more)</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>Observational studies</td>
<td>Serious³</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>1/87 (1.1%)</td>
<td>4/150 (2.7%)</td>
<td>RR 0.42 (0.05 to 3.86)</td>
<td>15 fewer per 1000 (from 25 fewer to 76 more)</td>
<td>⊕⊕⊕⊕ VERY LOW</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

### Postpartum haemorrhage

| 1 (Grisaru-Granovsky 2017) | Observational studies | Very serious | No serious inconsistency | No serious indirectness | Very serious² | None | 98/4081 (2.4%) | 77/3068 (2.5%) | RR 0.96 (0.71 to 1.28) | 1 fewer per 1000 (from 7 fewer to 7 more) | ⊕⊕⊕⊕ VERY LOW | CRITICAL |

### Endometritis

* Evidence review for previous caesarean section

March 2019
## Intrapartum care for women with existing medical conditions or obstetric complications and their babies

### Evidence review for previous caesarean section

**March 2019**

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Neuraxial analgesia</th>
<th>No neuraxial analgesia</th>
<th>Relative (95% CI)</th>
<th>Absolute</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neuraxial analgesia</strong></td>
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<td><strong>Importance</strong></td>
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<tr>
<td>1 (Sakala 1990)</td>
<td>Observational studies</td>
<td>Serious³</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>6/87 (6.9%)</td>
<td>7/150 (4.7%)</td>
<td>RR 1.48 (0.51 to 4.26)</td>
<td>22 more per 1000 (from 23 fewer to 152 more)</td>
<td>⊕⊝⊝⊝ VERY LOW</td>
<td>CRITICAL</td>
<td></td>
</tr>
<tr>
<td>1 (Grisaru-Granovsky 2017)</td>
<td>Observational studies</td>
<td>Very serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious⁴</td>
<td>None</td>
<td>358/4081 (8.8%)</td>
<td>361/3068 (11.8%)</td>
<td>RR 0.74 (0.65 to 0.85)</td>
<td>31 fewer per 1000 (from 18 fewer to 41 fewer)</td>
<td>⊕⊝⊝⊝ VERY LOW</td>
<td>IMPORTANT</td>
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</tr>
<tr>
<td>1 (Sakala 1990)</td>
<td>Observational studies</td>
<td>Serious³</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious²</td>
<td>None</td>
<td>11/87 (12.6%)</td>
<td>25/150 (16.7%)</td>
<td>RR 0.76 (0.39 to 1.47)</td>
<td>40 fewer per 1000 (from 102 fewer to 78 more)</td>
<td>⊕⊝⊝⊝ VERY LOW</td>
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<tr>
<td><strong>Emergency caesarean section</strong></td>
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<td><strong>Operative vaginal birth</strong></td>
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<tr>
<td>1 (Grisaru-Granovsky 2017)</td>
<td>Observational studies</td>
<td>Very serious¹</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious⁴</td>
<td>None</td>
<td>479/4081 (11.7%)</td>
<td>85/3068 (2.8%)</td>
<td>RR 4.24 (3.38 to 5.31)</td>
<td>90 more per 1000 (from 66</td>
<td>⊕⊝⊝⊝ VERY LOW</td>
<td>IMPORTANT</td>
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</tr>
<tr>
<td>Quality assessment</td>
<td>Number of studies</td>
<td>Design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
<td>Imprecision</td>
<td>Other considerations</td>
<td>Neuraxial analgesia</td>
<td>No neuraxial analgesia</td>
<td>Relative (95% CI)</td>
<td>Absolute</td>
<td>Quality</td>
<td>Importance</td>
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<tr>
<td>Granovsky 2017</td>
<td>1 (Sakala 1990)</td>
<td>Observational studies</td>
<td>Very serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Serious</td>
<td>None</td>
<td>28/87 (32.2%)</td>
<td>29/150 (19.3%)</td>
<td>RR 1.66 (1.06 to 2.60)</td>
<td>128 more per 1000 (from 12 more to 309 more)</td>
<td>⊕⊝⊝⊝ VERY LOW</td>
<td>IMPORTANT</td>
</tr>
<tr>
<td>Prolonged hospital stay (duration of hospital stay &gt;3 days for vaginal birth and &gt;4 days for caesarean section)</td>
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<tr>
<td>1 (Grisaru-Granovsky 2017)</td>
<td>Observational studies</td>
<td>Very serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>No serious imprecision</td>
<td>None</td>
<td>616/4081 (15.1%)</td>
<td>448/3068 (14.6%)</td>
<td>RR 1.03 (0.92 to 1.16)</td>
<td>4 more per 1000 (from 12 fewer to 23 more)</td>
<td>⊕⊝⊝⊝ VERY LOW</td>
<td>NOT IMPORTANT</td>
<td></td>
</tr>
<tr>
<td>Dehiscence in oxytocin-stimulated labour</td>
<td></td>
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</tr>
<tr>
<td>1 (Carlsson 1980)</td>
<td>Observational studies</td>
<td>Very serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious</td>
<td>None</td>
<td>2/59 (3.4%)</td>
<td>0/17 (0%)</td>
<td>RR 1.5 (0.08 to 29.84)</td>
<td></td>
<td>⊕⊝⊝⊝ VERY LOW</td>
<td>CRITICAL</td>
<td></td>
</tr>
<tr>
<td>Emergency caesarean section in oxytocin-stimulated labour</td>
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</tr>
<tr>
<td>1 (Carlsson 1980)</td>
<td>Observational studies</td>
<td>Very serious</td>
<td>No serious inconsistency</td>
<td>No serious indirectness</td>
<td>Very serious</td>
<td>None</td>
<td>8/59 (13.6%)</td>
<td>4/17 (23.5%)</td>
<td>RR 0.58 (0.2 to 1.68)</td>
<td>99 fewer per 1000</td>
<td>⊕⊝⊝⊝ VERY LOW</td>
<td>IMPORTANT</td>
<td></td>
</tr>
</tbody>
</table>
### Quality assessment

<table>
<thead>
<tr>
<th>Number of studies</th>
<th>Design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Neuraxial analgesia</th>
<th>No neuraxial analgesia</th>
<th>Relative (95% CI)</th>
<th>Absolute (from 188 fewer to 160 more)</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
</table>
| **Operative vaginal birth in oxytocin-stimulated labour**

1 (Carlsson 1980)
Observational studies
Very serious
No serious inconsistency
No serious indirectness
Serious<sup>4</sup>
None
20/59 (33.9%)
1/17 (5.9%)
RR 5.76 (0.83 to 39.88)
280 more per 1000 (from 10 fewer to 1000 more)
⊕⊕⊕⊕ VERY LOW
IMPORTANT

**Dehiscence in spontaneous labour**

1 (Carlsson 1980)
Observational studies
Very serious
No serious inconsistency
No serious indirectness
Not estimable due to 0 events
None
0/18 (0%)
0/25 (0%)
-
-
⊕⊕⊕⊕ VERY LOW
CRITICAL

**Emergency caesarean section in spontaneous labour**

1 (Carlsson 1980)
Observational studies
Very serious
No serious inconsistency
No serious indirectness
Very serious<sup>2</sup>
None
1/18 (5.6%)
1/25 (4%)
RR 1.39 (0.09 to 20.77)
16 more per 1000 (from 36 fewer to 791 more)
⊕⊕⊕⊕ VERY LOW
IMPORTANT

Evidence review for previous caesarean section
March 2019
Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of women</th>
<th>Effect</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operative vaginal birth in spontaneous labour</strong></td>
<td></td>
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</tr>
<tr>
<td>1 (Carlsson 1980)</td>
<td>Observational studies</td>
<td>Very serious</td>
<td>No serious inconsistency</td>
<td>Very serious</td>
</tr>
</tbody>
</table>

CI: confidence interval; RR: risk ratio
1 The quality of the evidence was downgraded by 2 levels due to unclear risk of selection bias as, although computerised medical records of all women who had a trial of labour after caesarean section in a single obstetric centre had their records reviewed and used for data analysis, the cohort is likely to be over-representative of women with more than 1 vaginal birth after caesarean section with no epidural as the group with no epidural included significantly more of these women compared to those who had an epidural (85% versus 65%). High risk of comparability bias (the study did not control for any factor)
2 The quality of the evidence was downgraded by 2 levels because the 95% CI crosses 2 default MID thresholds
3 The quality of the evidence was downgraded by 1 level due to high risk of comparability bias (the study did not control for any factor)
4 The quality of the evidence was downgraded by 1 level because the 95% CI crosses 1 default MID threshold
5 The quality of the evidence was downgraded by 2 levels due to unclear risk of selection bias as: although the study authors reported that after women who received oxytocin were excluded from the analysis, there was no difference in the operative vaginal birth rate between the epidural and the no epidural groups, they did not report how many women received oxytocin. High risk of comparability bias (the study did not control for any factor)
6 The quality of the evidence was downgraded by 2 levels due to high risk of selection bias (no clear description of the derivation of the cohort; no clear description of the non-exposed group. High risk of comparability bias (the study did not control for any factor). Also unclear risk of outcome bias (not reported how outcomes were collected)
a Defined as loss of >1000 ml blood within 24 hours of birth or transfusion of blood products within 72 hours of birth or a drop in haemoglobin concentration of >3 g/dl
b Absolute effect not estimable because 0 events in the control group
Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.

Appendix J – Health economic evidence profiles

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.

Appendix K – Health economic analysis

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.

Appendix L – Research recommendations

Intrapartum care for women with previous caesarean section – management of the first and second stages of labour

What is the clinical and cost effectiveness of intermittent auscultation compared with continuous cardiotocography for women in labour who have had a previous caesarean section?

Why this is important

The committee was aware that women at low risk of intrapartum complications have lower rates of intervention (such as caesarean section) and no difference in outcomes for the baby when fetal monitoring with intermittent auscultation is used rather than continuous cardiotocography. This is reflected in recommendations in the NICE guideline on intrapartum care for healthy women and babies (CG190). The committee was also aware that for women...
planning vaginal birth after a previous caesarean section, continuous cardiotocography is usually advised because of an increased risk of serious medical problems for the baby. However, it is uncertain whether offering continuous cardiotocography to women in labour who have had a previous caesarean section allows risk to be identified sooner than if intermittent auscultation is used. The committee agreed that a randomised controlled trial is needed to compare continuous cardiotocography with intermittent auscultation for women in labour who have had a previous caesarean section. The trial should evaluate clinical and cost effectiveness and consider both short- and long-term outcomes such as mortality in the baby, neonatal unit admission, requirement for respiratory ventilation, development of neonatal encephalopathy, developmental delay at 2 years, caesarean section, and woman’s experience of labour and birth.

**Research recommendation rationale**

<table>
<thead>
<tr>
<th>Research question</th>
<th>What is the clinical and cost effectiveness of intermittent auscultation compared with continuous cardiotocography for women in labour who have had a previous caesarean section?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance to 'patients' or the population</td>
<td>Continuous cardiotocography may be advised routinely for women planning a vaginal birth after a previous caesarean section. However, it is not certain that offering continuous cardiotocography in labour improves outcomes for either the woman or the baby compared with intermittent auscultation. It may lead to unnecessary interventions such as caesarean section without any benefit to the baby</td>
</tr>
<tr>
<td>Relevance to NICE guidance</td>
<td>The recommended research would facilitate development of a future update of this NICE guideline</td>
</tr>
<tr>
<td>Relevance to NHS</td>
<td>The efficient use of continuous cardiotocography is expected to improve outcomes for women and their babies and lead to a net saving for the NHS by reducing unnecessary interventions when the risk to the baby is insufficient to warrant use of continuous cardiotocography in preference to intermittent auscultation</td>
</tr>
</tbody>
</table>
| National priorities | The ability to provide clear guidance on whether continuous cardiotocography is more clinically and cost effective than intermittent auscultation for women in labour who have had a previous caesarean section would:  
  • improve care and outcomes  
  • reduce costs associated with unnecessary interventions  
  • reduce variations in practice |
| Current evidence base | The question of whether continuous cardiotocography is more clinically and cost effective than intermittent auscultation for women in labour who have had a previous caesarean section was not prioritised for consideration in the development of this guideline, but it could fit within the scope of a... |
Evidence review for previous caesarean section

Intrapartum care for women with existing medical conditions or obstetric complications and their babies

What is the clinical and cost effectiveness of intermittent auscultation compared with continuous cardiotocography for women in labour who have had a previous caesarean section?

future update. The recommended research should include an initial systematic review of the existing evidence base to inform the specifics of the recommended randomised controlled trial, for example in terms of the sample size needed to power the trial, outcomes to be prioritised and duration of follow-up

Equalities

No specific equalities issues were identified

**Research recommendation PICO**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Women in labour who have had a previous caesarean section</td>
</tr>
<tr>
<td>Intervention</td>
<td>Continuous cardiotocography</td>
</tr>
<tr>
<td>Comparator</td>
<td>Intermittent auscultation</td>
</tr>
</tbody>
</table>
| Outcomes | For the woman:  
- mode of birth (caesarean section)  
- woman's experience of labour and birth, including experience of the birth companion  
For the baby:  
- mortality  
- neonatal unit admission  
- requirement for respiratory ventilation  
- hypoxic ischaemic encephalopathy  
- developmental delay at 2 years |

Evidence review for previous caesarean section
### Intrapartum care for women with existing medical conditions or obstetric complications and their babies

<table>
<thead>
<tr>
<th><strong>Criterion</strong></th>
<th><strong>Explanation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Study design</td>
<td>Randomised controlled trial</td>
</tr>
<tr>
<td>Timeframe</td>
<td>Sufficient duration of follow up to allow evaluation of outcomes for the baby, including developmental delay at 2 years</td>
</tr>
</tbody>
</table>