Queensland Clinical Guidelines

Translating evidence into best clinical practice

Maternity and Neonatal **Clinical Guideline**

Vaginal birth after caesarean (VBAC)

Queensland Government

Document title:	Vaginal birth after caesarean (VBAC)
Publication date:	September 2020
Document number:	MN20.12-V5-R25
Document supplement:	The document supplement is integral to and should be read in conjunction with this guideline.
Amendments:	Full version history is supplied in the document supplement.
Amendment date:	Full review September 2020
Replaces document:	MN15.12-V4-R20
Author:	Queensland Clinical Guidelines
Audience:	Health professionals in Queensland public and private maternity and neonatal services
Review date:	September 2025
Endorsed by:	Queensland Clinical Guidelines Steering Committee Statewide Maternity and Neonatal Clinical Network (Queensland)
Contact:	Email: Guidelines@health.qld.gov.au URL: www.health.qld.gov.au/qcg

Cultural acknowledgement

We acknowledge the Traditional Custodians of the land on which we work and pay our respect to the Aboriginal and Torres Strait Islander Elders past, present and emerging.

Disclaimer

This guideline is intended as a guide and provided for information purposes only. The information has been prepared using a multidisciplinary approach with reference to the best information and evidence available at the time of preparation. No assurance is given that the information is entirely complete, current, or accurate in every respect.

The guideline is not a substitute for clinical judgement, knowledge and expertise, or medical advice. Variation from the guideline, taking into account individual circumstances, may be appropriate.

This guideline does not address all elements of standard practice and accepts that individual clinicians are responsible for:

- Providing care within the context of locally available resources, expertise, and scope of practice
- Supporting consumer rights and informed decision-making, including the right to decline intervention or ongoing management
- Advising consumers of their choices in an environment that is culturally appropriate and which enables comfortable and confidential discussion. This includes the use of interpreter services where necessary
- Ensuring informed consent is obtained prior to delivering care
- Meeting all legislative requirements and professional standards
- Applying standard precautions, and additional precautions as necessary, when delivering care
- Documenting all care in accordance with mandatory and local requirements

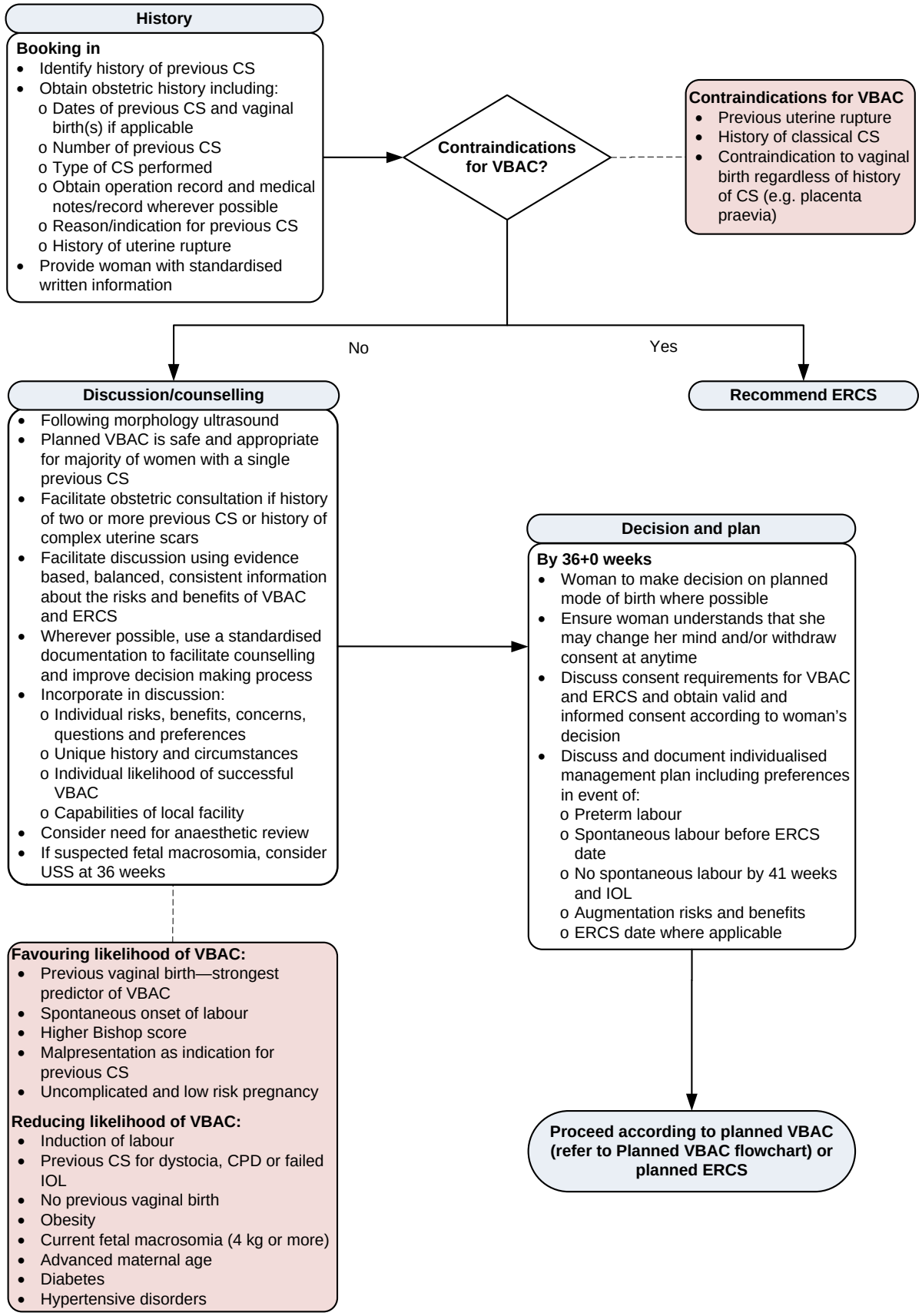
Queensland Health disclaims, to the maximum extent permitted by law, all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs incurred for any reason associated with the use of this guideline, including the materials within or referred to throughout this document being in any way inaccurate, out of context, incomplete or unavailable.

Recommended citation: Queensland Clinical Guidelines. Vaginal birth after caesarean (VBAC). Guideline No. MN20.12-V5-R25. Queensland Health. 2020. Available from: http://www.health.qld.gov.au/qcg

© State of Queensland (Queensland Health) 2020

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives V4.0 International licence. In essence, you are free to copy and communicate the work in its current form for non-commercial purposes, as long as you attribute Queensland Clinical Guidelines, Queensland Health and abide by the licence terms. You may not alter or adapt the work in any way. To view a copy of this licence, visit https://creativecommons.org/licenses/by-nc-nd/4.0/deed.en
For further information, contact Queensland Clinical Guidelines, RBWH Post Office, Herston Qld 4029, email Guidelines@health.qld.gov.au,. For permissions beyond the scope of this licence, contact: Intellectual Property Officer, Queensland Health, GPO Box 48, Brisbane Qld 4001, email ip_officer@health.qld.gov.au, phone (07) 3234 1479.

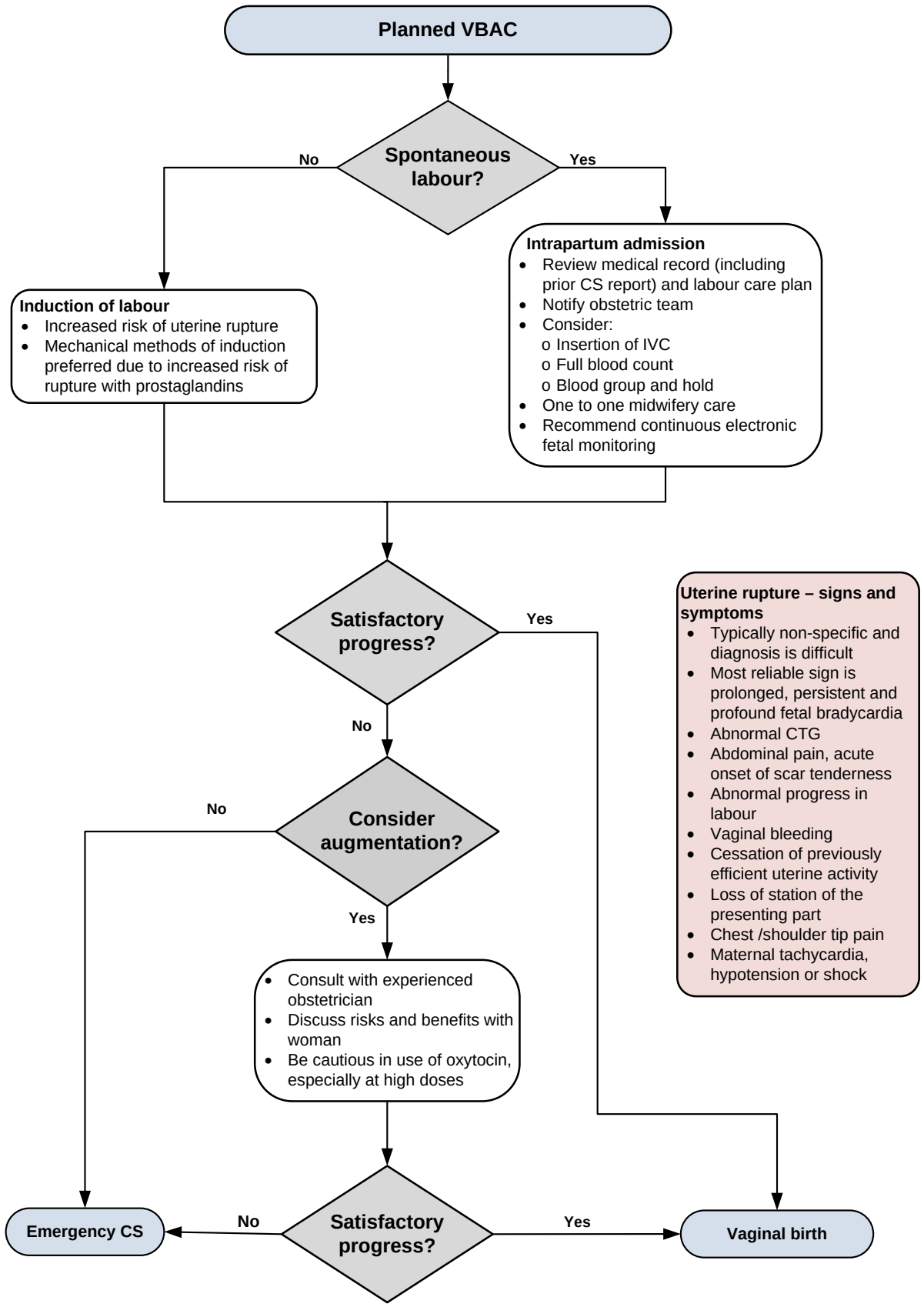
Flow chart: Decision-making framework for women with previous caesarean section



BMI: body mass index; **CPD:** cephalopelvic disproportion; **CS:** caesarean section; **ERCS:** elective repeat caesarean section; **HHS:** Hospital and Health Service; **IOL:** induction of labour; **USS:** ultrasound scan; **VBAC:** vaginal birth after caesarean section

Flowchart: F20.12-2-V1-R25

Flow Chart: Planned vaginal birth after caesarean (VBAC)



CS: caesarean section; **CTG:** cardiotocograph; **FHR**: fetal heart rate; **IVC**: intravenous catheter; **VBAC:** Vaginal Birth after

Flowchart: F20.12-1-V5-R25

Table of Contents

List of Tables

Abbreviations

ARM	Artificial rupture of membranes, amniotomy
BMI	Body mass index
CEFM	Continuous electronic fetal monitoring
CS	Caesarean section
ERCS	Elective repeat caesarean section
IOL	Induction of labour
VBAC	Vaginal birth after caesarean section

Definitions

Bishop score	A score used to assess the cervix and inform the choice of method of induction of labour. Features of the cervix are scored and then the scores are summed.
Continuity of care	Where the same health professional or professionals provide care throughout a woman's pregnancy, birth and the post birth period.
Elective repeat caesarean section (ERCS)	Planned caesarean birth by a woman who has had one or more prior caesarean section (CS), whether the previous caesarean births were electively scheduled or not.
Inter-pregnancy interval	Time from CS (birth) to conception or onset of subsequent pregnancy.
Neonatal respiratory morbidity	Combined rate of transient tachypnoea of the newborn and respiratory distress syndrome.[1]
Obstetrician	Local facilities may, as required, differentiate the roles and responsibilities assigned in this document to an "Obstetrician" according to their specific practitioner group requirements; e.g. General Practitioner Obstetricians, Specialist Obstetricians, Consultants, Senior Registrars and Obstetric Fellows.
Planned VBAC	Planned VBAC (vaginal birth after caesarean) refers to the intended mode of birth of any woman who has had a previous caesarean section who plans to have a vaginal birth rather than an ERCS.
Planned VBAC rate	The proportion of pregnant women with a history of CS who are planning a VBAC as their preferred mode of birth. A planned VBAC may result in a VBAC or CS.
Primary caesarean section	A woman's first CS.
Uterine dehiscence	Disruption of the uterine muscle with intact uterine serosa.[1]
Uterine rupture	Disruption of the uterine muscle extending to and involving the uterine serosa or disruption of the uterine muscle with extension to the bladder or broad ligament.[1]
VBAC	Vaginal birth following one or more previous CS.
VBAC rate	The proportion of planned VBAC which results in vaginal birth.

1 Introduction

A higher proportion of women are presenting with a history of caesarean section (CS) due to the increasing rate of primary CS.[2] Options for the subsequent birth are:

- A planned vaginal birth after caesarean (VBAC) which will result in either a vaginal birth or an emergency CS
- An elective repeat CS (ERCS)

Termination of pregnancy in women with previous CS is not addressed in this guideline. Refer to Queensland Clinical Guideline: *Termination of pregnancy.*[3]

1.1 Background

There are infrequent, yet significant risks with both planned VBAC and ERCS.[4] Clinical outcomes are determined mainly from epidemiological studies[5] and one randomised control trial (n=22).[6] Findings from a large systematic review concluded planned VBAC is a reasonable and safe choice for most women.[4] However, individual circumstances may increase the risks associated with VBAC.[4] Facilitating informed decision-making through the provision of consistent, accurate and individualised advice is vital to enable women to make decisions about their birth options.

Table 1. Background

Aspect	Consideration
International context	• History of rising CS rates in Australia and around the world, leading to an increasing proportion of women having a subsequent pregnancy with a history of CS[7-9] • VBAC is supported by professional colleges from across the world as an acceptable birth option[1,10-12]
Australian context	• VBAC rates increased in the 1990s and reduced overall CS numbers o This trend was reversed by growing concern about uterine rupture[13] • ERCS is the most common indication for a CS[7] and is one of the greatest contributors to the overall CS rate[14,15] • CS rate in Australia in 2017 was 35%[2]
Queensland context	• CS rate in Queensland in 2018 was 35.8%[16] • In 2016 and 2017 in Queensland[17]: o 50.0% CS rate in private facilities o 28.9% CS rate in public facilities • In Queensland from 2016 to 2018[16]: o 42.5% of CS were repeat CS o 57.5% were primary CS
Service capability	• VBAC not specified in current Clinical Services Capability Framework[18] • Develop locally agreed criteria for VBAC care to reflect local resources and the ability of the birthing facility to respond to emerging situations • Ensure the service has capacity to provide: o Access to an emergency CS[19,20] including clearly defined Category 1 CS policy/workplace instruction and processes o Continuous electronic fetal monitoring during labour[1,11] o One-to-one midwifery care during labour[1,11] o Advanced neonatal resuscitation[11] o Onsite blood transfusion[19] o 24 hour anaesthetic services
Terminology	• Language is known to reflect and influence attitudes and behaviour[21] • A wide variety of terms, phrases and acronyms have been developed to refer to women and birth after one or more CS[21] • Woman-centred language and terminology is preferred in order to provide safe, woman-centred care and facilitate informed consent • Important terms used in this guideline include: o VBAC ▪ Preferred instead of 'trial of scar' and 'trial of labour after caesarean' o Planned VBAC rate—the proportion of pregnant women with a history of CS who are planning a VBAC as their preferred mode of birth (may result in a VBAC or CS) o VBAC rate—the proportion of planned VBAC resulting in vaginal birth ▪ Preferred instead of 'successful VBAC rate'

2 Benefits and risks of planned VBAC and ERCS

The absolute risk of adverse outcomes for both planned VBAC and ERCS is small.[8,22] The benefits to a woman of having a planned VBAC are generally related to vaginal birth, as this typically has the lowest morbidity.[1,23,24] Most maternal morbidity related to planned VBAC occurs if an emergency CS (as opposed to an ERCS[11]) is required.[23,25] Consequently, a woman's risk of morbidity is closely related to her probability of VBAC.[25]

Comparison in outcomes between VBAC and ERCS have been reported in large observational cohort studies.[4,22,26] Outcome reports for the planned VBAC group include women who experienced uterine rupture and/or had an emergency CS.

2.1 Benefits and risks of planned VBAC

Table 2. Risks and benefits of planned VBAC

Maternal benefits	**Maternal risks**
• 72–75% chance of vaginal birth[4] o Refer to Section 3 Likelihood of VBAC • If vaginal birth: o Shorter hospital stay[4,19,23] o Faster recovery[1,25] o Avoidance of major surgery[25] and multiple CS in future[11] o Increased likelihood of future vaginal birth[1] o Sense of satisfaction and empowerment in having vaginal birth if desired[11,27] • Reduced risk of maternal mortality compared with ERCS (0.004% versus 0.013%)[1,4,23] o Extremely rare event regardless of mode of birth[12] • Increased likelihood of breastfeeding compared with ERCS[8,28-30] o Increased likelihood remains even if planned VBAC results in emergency CS[28]	• 25–28% chance of emergency CS[1] o Refer to Section 3 Likelihood of VBAC o Emergency CS is associated with increased morbidity compared to ERCS • Around 0.5% risk of uterine rupture o If rupture occurs, it may be associated with significant maternal and perinatal morbidity [refer to Section 6.2 Uterine rupture] o Estimated incidence varies across studies[12] o Risk increases with induction and augmentation of labour [refer to Section 5 Induction and augmentation of labour] • If vaginal birth: o Potential trauma to perineum and pelvic floor[1,11,31,32] ▪ Refer to Queensland Clinical Guideline: *Perineal care*[33] o Increased risk of anal sphincter injury for women having second birth following one previous CS compared with nulliparous women[32,34-37] ▪ Birthweight strongest predictor[34] ▪ Rate of instrumental birth also increased[34] (refer to Queensland Clinical Guideline: *Instrumental vaginal birth*[38])
Fetal and neonatal benefits	**Fetal and neonatal risks**
• Increased likelihood of breastfeeding at birth, hospital discharge and six to eight weeks postpartum[8,28,30]	• Increased risk of perinatal mortality compared with ERCS (0.13% versus 0.05%)[4] • 0.1% prospective risk of antepartum stillbirth beyond 39+0 weeks (recommended timing for ERCS) while awaiting spontaneous labour[1,39] o Similar to nulliparous women • Increased risk of hypoxic ischaemic encephalopathy (HIE) and associated long term sequelae compared with ERCS[40] o 0.08% versus less than 0.01%[40] o Majority of cases associated with uterine rupture[40]

2.2 Benefits and risks of planned ERCS

Table 3. Benefits and risks of planned ERCS

Maternal benefits	Maternal risks
• Extremely low risk of uterine rupture[1] o Less than 0.03%[4] • Ability to plan a known ERCS date[1] o May change based on clinical circumstances o Increased likelihood of avoiding an emergency CS • Prevalence of urinary incontinence and pelvic organ prolapse is lower in women who have only given birth by CS than in those who have given birth vaginally[41] o Difference in rates of urinary incontinence appear to level out with increasing age[41] • If fertility is no longer desired, option for sterilisation[1]	• Potential difficulties conceiving further pregnancies[5] • More likely to require CS for future births o Increasing risk of maternal morbidity with increasing number of CS. o Refer to Table 4. Additional considerations • Increased risk of maternal mortality compared with planned VBAC[4] o 0.013% versus 0.004%[1,4] • Decreased rates of breastfeeding[8,28,30,42]
Fetal and neonatal benefits	**Fetal and neonatal risks**
• Reduced risk of HIE compared with planned VBAC (less than 0.01% compared with 0.08%)[1,40] o Related to reduced risk of uterine rupture • Lower rate of perinatal mortality compared to planned VBAC (0.05% versus 0.13%)[4]	• Decreased likelihood of breastfeeding at birth, hospital discharge and six to eight weeks postpartum[8,28-30]

2.3 Additional considerations

Table 4. Additional considerations

Aspect	Consideration
Hysterectomy	• The risk of hysterectomy has not been shown to differ significantly between planned VBAC and ERCS[4,24]
Haemorrhage and transfusion	• One systematic review and meta-analysis did not demonstrate a significant difference in rates of haemorrhage and blood transfusion between planned VBAC and ERCS[24] • Evidence is limited due to inconsistency in definitions and subjectivity in measurement[4] • Some retrospective cohort studies have found an increased risk of haemorrhage and transfusion with planned VBAC compared to ERCS[6,8]
Multiple CS	• Risk of serious maternal morbidity increases in a dose response fashion as the number of CS increases[43] • Risk of the following outcomes were found to consistently increase with the number of CS[43]: o Hysterectomy[44] o Haemorrhage and blood transfusion o Adhesions o Surgical injuries o Placenta praevia and accreta • No change has been found in rates of infection or abruption with increasing number of CS[43]
Neonatal respiratory morbidity	• Neonatal respiratory morbidity can occur regardless of mode of birth, making conclusions about the relationship to method of labour and birth unclear[4] • Studies are conflicting regarding whether VBAC or ERCS results in more transient tachypnoea of newborn[4,45] • CS is known to be associated with respiratory morbidity, especially prior to 39+0 weeks gestation o One trial reported that for elective CS, respiratory morbidity was 11.4%, 6.2% and 1.5% at 37, 38 and 39 weeks gestation respectively[46]

3 Likelihood of VBAC

Table 5. Likelihood of VBAC

Aspect	Consideration
General	• Information about the likelihood of a VBAC assists women when deciding on their planned mode of birth • Reported rates of VBAC are highly variable across studies • Meta-analysis of over 100,000 VBAC labours reported a pooled VBAC rate of 74%[4] o Reported VBAC rates ranged from 49% to 87%[4]
Prediction models	• Several prediction models and algorithms, tools and calculators have been developed to predict likelihood of VBAC[1] o These are not yet applied routinely in decision-making process and their precise role is not yet established[1] • Pelvimetry is not useful for predicting likelihood of VBAC and is not recommended for use in decision-making about mode of birth[19]
Models of care	• One-to-one support in labour reduces likelihood of CS[19] • One small study found that women receiving continuity of care from a midwife experienced shorter labours and increased VBAC rates compared to women receiving standard maternity care[47] • One study found that planned VBAC and VBAC rates improved significantly when midwives were the primary intrapartum care providers, without compromising maternal or neonatal outcomes[48]
Factors not statistically significant	• Smoking[49] • Inter-pregnancy interval[49] o Refer to Definitions • Gestational weeks[49] • Epidural use in labour[49] • Previous CS for fetal distress[49]
Recommendation	• Where possible, audit local VBAC rates and benchmark against other Queensland maternity services o When counselling women about mode of birth, provide locally derived VBAC rates to account for differences in populations, VBAC policies and healthcare provision[1] • Counsel women according to individual factors which will affect probability of VBAC o Refer to Table 6. Factors favouring and reducing rates of VBAC

Table 6. Factors favouring and reducing rates of VBAC

Factors favouring likelihood of VBAC	Factors reducing likelihood of VBAC
• Previous vaginal birth[11,12,49] o Strongest predictor of vaginal birth, especially previous VBAC[11,49] o VBAC rates are reported to be 85–91% in this cohort • Fetal malpresentation was indication for previous CS[49] • Spontaneous onset of labour[12] • Higher Bishop score[12,49] • Uncomplicated, low risk pregnancy[11]	• No previous vaginal birth[11] • Previous CS for: o Dystocia or failure to progress[11,12,49] o Failed induction[49] o Cephalopelvic disproportion[49] • Induction of labour (IOL)[11,12,49] • Hypertensive disorders complicating pregnancy[49] • Obesity[49,50] • Advanced maternal age[11,12,49] • Current fetal macrosomia of 4 kg or more[11,12,49] • Diabetes (both gestational and pre-existing)[49]

4 Decision-making and planning

4.1 Clinical standards

Table 7. Clinical standards

Aspect	Consideration
Following primary CS	• Offer women the opportunity to debrief and discuss their birth experience, as well as their potential suitability for a planned VBAC in the future[11] • Explain the reason for CS to facilitate good understanding • Discuss planning for future pregnancies and births including: o Contraception o Interval from CS to next pregnancy and birth (refer to Section 4.3.1 Inter-pregnancy interval) o Information regarding considerations for mode of birth in subsequent pregnancies • Provide the woman and her general practitioner with written information regarding the primary CS and discussion
Antenatal care	• Offer women access to individualised advice and care planning throughout pregnancy • Recommend counselling for mode of birth be conducted by an experienced midwife or obstetrician soon after morphology ultrasound scan[1] o Discuss, consult and refer according to professional guidelines[51] o Recommend decision regarding mode of birth be made by 36+0 weeks gestation[1,11] o Refer to Section 4.2 Antenatal counselling
Standard care	• Refer to QCG *Standard care* guideline[52] for further information on clinical standards relevant to VBAC including: o Woman-centred care o Informed consent o Informed decision-making o Communication standards o Culturally safe and appropriate care o Documentation • If woman declines recommended care, refer to *Partnering with the woman who declines recommended maternity care* guideline[53]
Timing of ERCS	• If woman decides on ERCS, book ERCS after 39+0 weeks o Risk of respiratory morbidity decreases after 39+0 weeks[19]

4.2 Antenatal counselling

Table 8. Antenatal counselling

Aspect	Consideration
Decision challenges	• Qualitative research has found that women experience various challenges when deciding between a planned VBAC or ERCS including[27]: o Difficulty accessing information[54] o A sense of reluctance and lack of support about VBAC from health care providers, even from 'pro-VBAC' services o Emphasis on risks of VBAC without inclusion of the benefits ▪ Risks emphasised include uterine rupture, death of woman, baby or both, risk of having an emergency CS o A sense of feeling irresponsible or careless for planning a VBAC o Unclear, widely variable and contrasting information from the health care system and professionals
Decision aids/tools	• May facilitate decision-making through[55] o Reduced anxiety[56] o Lowering decisional conflict[56] o Improved levels of knowledge and satisfaction[56] o Increasing perception of having made an informed choice • Checklists are helpful for guiding antenatal counselling[25] • Other tools may include[55]: o Telephone decision coaching o One-on-one counselling o Group information o Support sessions o Decision protocols or algorithms • Provide written information to women to guide discussion • For examples, refer to: o Appendix A: Example VBAC counselling checklist o Appendix B: Example management plan checklist
Models of care	• A prospective cohort study in Australia found that a dedicated 'next birth after caesarean clinic' combined with standardised labour management increased planned VBAC rates from 17.2% to 27%[7] • Qualitative research found that a midwifery led 'next birth after caesarean clinic' was an effective strategy to meet women's informational needs and address decisional conflict around VBAC[57]
Documentation	• Document: o Discussions in the woman's clinical record[1] o The woman's acknowledgement of discussions (may be included on a VBAC or ERCS consent form—refer to local facility guidelines) o Decisions regarding mode of birth and the agreed plan of care, including if labour commences before the expected ERCS date o The use of interpreter services where language barriers are present o If planning VBAC, agreed intrapartum plan of care • Documentation on a standardised checklist is recommended[1,25] • For examples, refer to: o Appendix A: Example VBAC counselling checklist o Appendix B: Example management plan checklist
Decision	• Plan for decision regarding mode of birth before 36 weeks and review plan if requested by woman at any time[1] • Address possible outcomes and clinical circumstances and outline options should these arise (e.g. onset of spontaneous labour before planned ERCS) o Refer to Appendix B: Example management plan checklist
Recommendation	• Present risks and benefits in an accurate balanced and systematic way to enable women to make an informed decision[27] • Individualise discussions to woman's medical circumstances, preferences and individual likelihood of VBAC[1] • Be mindful that women weigh potential risks and benefits uniquely[25] • Consider intended family size and risk of additional CS with recognition that future plans may be uncertain and may change[25]

4.3 Mode of birth considerations

Table 9. Mode of birth considerations

Aspect	Consideration
Contraindications for planned VBAC	• Contraindications for VBAC include: o Previous uterine rupture[1,10,58,59] ▪ Higher risk (5% or greater) of recurrent uterine rupture in labour[1,59] o Previous classical CS[1,10,60] o Other contraindications to vaginal birth which apply irrespective of history of CS (e.g. major placenta praevia)[1] • If history of complicated uterine scars, exercise caution and seek expert advice o Insufficient evidence on safety of VBAC in women with history of inverted T or J incisions, low vertical uterine incisions or significant inadvertent uterine extension at the time of primary CS[1,40,61,62] o Recommend mode of birth decisions are made on case by case basis in consultation with an experienced obstetrician with access to details of previous surgery[1]
Clinical history	• At booking in, obtain previous birth information including: o Dates of previous CS and vaginal birth(s) if applicable o Number of previous CS o Type of CS performed o Operation report to verify the type of uterine incision, previous uterine closure technique, and any perioperative complications o Indication(s) for previous CS o History of uterine rupture • Ideally obtain the operation report prior to the initial discussion with the woman o Request early in pregnancy, as it can be difficult to access operative notes performed at other facilities • VBAC with an unknown type of incision has not been associated with an increased risk of uterine rupture[25,63] o Reasonable to plan for VBAC unless there is high suspicion of previous classical uterine incision (e.g. previous CS at extremely preterm gestation)[25] • There is conflicting and insufficient evidence regarding single versus double layer uterine closure at CS and risk of uterine rupture in subsequent pregnancies[11,12,64,65]
Individual preferences	• Woman's decision will be influenced by many factors including: o Previous experience of a vaginal birth[5] o Feelings about previous CS[5] o Family considerations including recovery time[5] o Likelihood of VBAC (refer to Section 3 Likelihood of VBAC) o Unique and individual perception of risk o A sense that labour and vaginal birth may be empowering[23] o Desire for partner's involvement[23] o Scheduling convenience[23] o Desire to avoid pain of labour[23] o Desire for sterilisation[23] o Cultural identity, values and beliefs
Facility	• The capabilities of the maternity service[18] • If the local hospital cannot provide VBAC, recommend and facilitate transfer to a hospital that offers planned VBAC o Refer to local and professional consultation and referral guidelines[11,51]

4.3.1 Inter-pregnancy interval

Table 10. Inter-pregnancy interval

Aspect	Consideration
General	• Inter-pregnancy interval refers to time from CS (birth) to conception or onset of subsequent pregnancy • Potential concerns about a short interval between CS and subsequent pregnancy include: o Risk of uterine rupture[10,65-67] o Risk of placenta praevia and abnormal placentation[68] o Impact on likelihood of VBAC[68] o Risk of preterm labour[69]
Evidence challenges	• Limited high level evidence for ideal minimum inter-pregnancy interval for VBAC[68] • Existing body of literature is difficult to interpret due to conflicting results, inconsistent definitions and study design limitations[65,66,70-73] • Variation among international professional organisations regarding recommended inter-pregnancy interval for VBAC[1,10,11,25]
Recommendation	• Available evidence indicates that birth spacing is an independent risk factor for uterine rupture, placenta praevia and abnormal placentation[68] • Inform women that an inter-pregnancy interval of less than 12 months is associated with an increased risk of[68]: o Uterine rupture[67,68,72,74] o Placenta praevia[68] o Placental abruption[68] o Preterm birth[73,75] • A short inter-pregnancy interval is not a contraindication for VBAC o Facilitate consultation with an experienced obstetrician if inter-pregnancy interval is less than 12 months o Consider clinical and individual circumstances and advise women of risks to enable informed decision-making • Inter-pregnancy interval has not been shown to affect VBAC rates for women with spontaneous labour[26,76]

4.3.2 Two or more previous caesareans

Table 11. Two or more previous caesareans

Aspect	Consideration
General	• Women with a history of two prior CS appear to have similar VBAC rates as those with one prior CS, although studies have reported mixed findings[5,10] • Limited studies—most are retrospective, low quality evidence with inconsistent findings[25,77-79] • Systematic review of literature on vaginal birth after two CS reported[80]: o VBAC rate of 71% o Uterine rupture rate of 1.36% o Comparable maternal morbidity with repeat (third) CS o No significant differences in neonatal morbidity, although data was too limited to draw valid conclusions • Limited studies reporting on outcomes of women with three or more previous CS[10,25] o One retrospective cohort study reported similar VBAC rates and maternal morbidity for women with three or more prior CS as those who had an ERCS[77] • Studies addressing the risks and benefits of VBAC in women with more than one previous CS have not reached consistent conclusions about how the risk compares with women with only one prior CS[25]
Recommendation	• VBAC is a reasonable option for women with a history of two or more prior CS following counselling with an experienced obstetrician[1] o Discuss risk of uterine rupture, maternal morbidity and individual likelihood of vaginal birth when counselling o Use of counselling checklist is recommended o Refer to Appendix B: Example management plan checklist

5 Induction and augmentation of labour

Table 12. Induction of labour

Aspect	Consideration
Queensland context	• In the years 2016 to 2018 (inclusive) in Queensland, for both preterm and term pregnancies in women having their next birth after one or more CS[16]: o 72.3% of VBACs had a spontaneous onset of labour o 27.7% of VBACs had an induced onset of labour
Risk of rupture	• The risk of uterine rupture is increased with IOL and augmentation of labour[4,9,26,40,81] • Observational studies currently offer the best, although limited evidence to guide practice[10] o Evidence from randomised controlled trials on IOL in setting of VBAC is inadequate and underpowered[82] • Reported risks of rupture vary widely across studies[1,4] • A large Australian cohort study found the following rates of uterine rupture for planned VBAC after one CS[9]: o Spontaneous labour with no augmentation—0.15% o Spontaneous labour with augmentation with oxytocin—1.91% ▪ Inconsistent with other studies which report a lower risk of rupture with augmentation compared with IOL[4,26,40] o Induction of labour with oxytocin alone—0.54% o Induction of labour with prostaglandin alone—0.68% o Induction with both prostaglandin and oxytocin—0.88%
Method of IOL	• The use of prostaglandins is associated with a higher risk of uterine rupture compared with mechanical methods (amniotomy or balloon catheter)[1,10] • Induction with a balloon catheter appears to have a more favourable safety profile compared to induction with dinoprostone (prostaglandin E_2) with similar rates of vaginal birth and efficacy[83,84] • Prospective cohort study of women with a previous CS found that IOL with a balloon catheter did not result in a significant increase in adverse maternal or neonatal outcomes compared to ERCS[85] • A case control study demonstrated a relative increase in the risk of uterine rupture with increasing doses of oxytocin[86] o Uterine rupture rate of 2.07% was found at maximum oxytocin dosages of 21–30 milliunits per minute
Recommendation	• Careful assessment by an experienced obstetrician is required when considering induction and/or augmentation of labour in VBAC setting[1] • Induction of labour and augmentation of labour are not contraindicated in VBAC, but are associated with: o Increased risk of uterine rupture[10] o Lower rates of VBAC[10] • Inform women of the risks and benefits of induction of labour and augmentation of labour during antenatal counselling o Refer to 4.2 Antenatal counselling • Consider IOL if: o Risks of expectant management outweigh the risks of induction and/or augmentation o Woman prefers IOL/augmentation over CS • If there is a delay in progress and in the active stage of labour, perform artificial rupture of membranes (ARM) prior to consideration of oxytocin augmentation • If IOL and/or augmentation proceeds: o Use mechanical methods of IOL where possible[10] o Avoid prostaglandins where possible[10] o Be cautious in use of oxytocin[10], especially in higher doses[87]

6 Intrapartum care

Table 13. Intrapartum care for VBAC

Aspect	Consideration
On admission	• Notify and consult the obstetric team/medical officer when a woman presents for planned VBAC • Review the plan of care prepared antenatally in consultation with the woman and revise if necessary o Woman may change her choice of birth mode to CS or planned VBAC at any stage, including in labour o Respect woman's choice of mode of birth • If difficult cannulation is anticipated or additional risk factors are present, insert an intravenous cannula (IVC)[88] o Routine siting of an IVC is not required • Consider collection of bloods for full blood count and blood group and hold
Fetal surveillance	• Recommend continuous electronic fetal monitoring (CEFM) during labour[19] • An abnormal fetal heart rate is the most consistent finding in uterine rupture • Refer to Queensland Clinical Guideline: *Intrapartum fetal surveillance*[89]
Labour	• Provide one-to-one midwifery care and continuous support o Associated with improved birth outcomes o Enables prompt identification and management of uterine scar dehiscence or rupture • Once in active labour, recommend initial vaginal examination, and then fourth hourly/as indicated o If delay in progress of labour at any stage, consult with experienced obstetric and midwifery staff • Observe for signs and symptoms of uterine dehiscence or rupture o Refer to Section 6.2 Uterine rupture o Refer to the National Consensus Statement: Essential elements for recognising and responding to clinical deterioration[90] • Increased risk of obstetric anal sphincter injury for women having a VBAC o Refer to Queensland Clinical Guideline: *Perineal care* • Manage third stage as per local policy o No special requirements for VBAC

6.1 Pain relief

No evidence has been identified that precludes women undergoing a planned VBAC from having access to the full range of pain relief options.[88]

Table 14. Pain relief

Aspect	Consideration
Water immersion and birth	• No known contraindications to water immersion for planned VBAC[88] • Support women requesting water immersion planning a VBAC o Recommend CEFM suitable for water immersion (telemetry) • Refer to local policy on water immersion for further guidance • Refer to Queensland Clinical Guideline: *Normal birth*[91] for more information on water immersion and birth
Epidural	• In the years 2016 to 2018 (inclusive) in Queensland, for both preterm and term pregnancies in women having their next birth after one or more CS[16]: o 28.7% of women having a VBAC had an epidural in labour • Considered safe for women attempting a VBAC[10,11,92] o If woman with epidural in situ has an increasing requirement for pain relief in labour, maintain awareness of possibility of impending uterine rupture[1] ▪ This sign is neither sensitive nor specific[10] ▪ Acute onset of scar pain or tenderness is seldom masked by an epidural[10] o Abnormal CTG is most persistent finding in uterine rupture[1] ▪ Refer to Section 6.2 Uterine rupture • Epidural use during attempted VBAC (compared with no epidural) is associated with: o Higher rates of VBAC[92] o Higher rates of instrumental birth[92] o Similar rates of uterine rupture[92] • Refer to Queensland Clinical Guideline*: Epidural in labour*[93]

6.2 Uterine rupture

Table 15. Uterine rupture

Aspect	Consideration
Context	• May occur at any stage of labour and can occur during pregnancy or postpartum • There are no reliable clinical markers or models that predict uterine rupture or its timing • Risk of uterine rupture with a previous CS regardless of mode of birth is 0.3%[4] o Risk for a planned VBAC following one prior CS is approximately 0.5%[1,10] o Risk for an ERCS is approximately 0.03%[4] • Previous vaginal birth reduces the risk of uterine rupture[94,95]
Scar dehiscence versus uterine rupture	• Uterine rupture refers to a disruption of the uterine muscle extending to and involving the uterine serosa or disruption of the uterine muscle with extension into the bladder or broad ligament • Uterine scar dehiscence is a disruption of the uterine muscle with intact uterine serosa o Scar dehiscence may be asymptomatic in up to 48% of women[96]
Signs and symptoms	• The most common sign is prolonged, persistent and profound fetal bradycardia[97] which occurs in approximately 80% of cases[98] • Typically non-specific, some are rare and some may be associated with other obstetric circumstances, making diagnosis difficult[97] • Assess in the context of the woman's individual circumstances • Classic triad of complete uterine rupture (pain, vaginal bleeding, fetal heart rate abnormalities) may present in less than 10% of cases[96] • Other non-specific signs and symptoms may include: o Abnormal CTG[1,10,97,98] o Abdominal pain, especially if persisting between contractions[1] o Acute onset of scar tenderness[1,97] o Abnormal progress in labour, prolonged first or second stage of labour[97] o Abnormal vaginal bleeding[1,97,98] o Cessation of previously efficient uterine activity[97,98] o Loss of intrauterine pressure or cessation of contractions[98] o Haematuria[1] o Loss of station of the presenting part[1,97] o Easier abdominal palpation of fetal parts[10] o Chest pain or shoulder tip pain (particularly in the absence of vaginal bleeding) o Maternal tachycardia, hypotension or shock[98]
Clinical significance	• Consequences of uterine rupture are dependent on time between rupture and birth of baby[98] • If uterine rupture occurs: o Reported rates of hysterectomy range from 14–33%[4] o Pooled risk of perinatal death of 6.2%[4] o Reported rates of perinatal death in term babies range from 0–2.8%[4] o No maternal deaths have been reported[4]
Uterine thickness	• There is a relationship between lower uterine thickness and risk of uterine rupture[10] o No known cut-off between safe and unsafe VBAC[10] o Ultrasonographic measurement does not currently provide a clear prediction of uterine rupture so its usefulness is limited[10,11]
Recommendation	• Category 1 CS is required for suspected uterine rupture as there is an urgent threat to the woman and her baby[20] • Expeditious laparotomy and neonatal resuscitation are essential to reduce associated morbidity and mortality[1] • Ultrasonographic measurements of uterine thickness and pelvimetry are not yet useful for counselling women on their risk of uterine rupture during an attempted VBAC[10]

7 Special circumstances

Table 16. VBAC in special clinical situations

Aspect	Consideration
Multiple pregnancy	• Not considered a contraindication to VBAC[10] • Various studies have reported similar rates of VBAC in twin pregnancies to those of singleton pregnancies[1]
Macrosomia	• Multiple studies consistently report lower VBAC rates in women with neonatal birth weights greater than 4 kg[10] • Birthweight of 4 kg or more and a history of previous CS is associated with an increased risk of[1,99]: o Uterine rupture o Caesarean birth o Shoulder dystocia o Third and fourth degree perineal tears • If suspected fetal macrosomia, consider ultrasound scan at 36 weeks
Breech	• External cephalic version (ECV) is not contraindicated for women with history of previous CS[25] o Similar rates of successful ECV for women with and without a history of CS[25] • Breech presentation is not an absolute contraindication for VBAC[10] o Advise women there is insufficient evidence to assess risks of VBAC with breech presentation
Preterm	• Similar VBAC rates for preterm and term pregnancies[1] • Rates of uterine rupture and dehiscence are lower in preterm compared to term VBAC[1]
Increased maternal age	• Maternal age of 40 years or more is an independent risk factor for stillbirth and caesarean birth[1] • Evidence does not provide enough information to determine a maternal age threshold over which an ERCS is preferable to VBAC[12] • Carefully consider the timing of birth in women aged 40 years or above who plan for a VBAC[1] • Insufficient evidence to recommend optimum timing for birth[1]
Intrauterine fetal death	• Individualise care and management according to unique circumstances o Consult with experienced obstetrician to discuss risks and benefits of induction with woman who has an intrauterine fetal death and previous CS[100] • High VBAC rates reported (87%)[1] • If planned VBAC, monitor and palpate contractions closely in labour o Avoid uterine hypertonus and tachysystole, and observe closely for signs of uterine rupture • If previous classical CS, recommend repeat CS[101] • Refer to Queensland Clinical Guideline: *Stillbirth care*[102] for further guidance
Termination of pregnancy	• Refer to Queensland Clinical Guideline: *Termination of pregnancy*[3] for methods of termination in women at risk of uterine rupture

8 Postpartum care

Provide standard postnatal care according to method of birth and clinical circumstances. Offer women the opportunity to discuss the implications for future pregnancies of their birth experience. Consider and assess emotional wellbeing and facilitate corresponding support where indicated. Refer to Table 7. Clinical standards.

References

1. Royal College of Obstetricians and Gynaecologists. Birth after previous caesarean birth: Green-top guideline no. 45. [Internet]. 2015 [cited 2019 Dec 17]. Available from: http://www.rcog.org.uk.
2. Australian Institute of Health and Welfare. Australia's mothers and babies 2017: in brief. Perintal statistics series no. 35. Cat. no. PER.100. [Internet]. 2019 [cited 2019 Dec 17]. Available from: http://www.aihw.gov.au.
3. Queensland Clinical Guidelines. Termination of pregnancy. Guideline No. MN19.21-V4-R24. [Internet]. Queensland Health. 2019. [cited 2020 July 23]. Available from: http://www.health.qld.gov.au
4. Guise JM, Eden K, Emeis C, Denman MA, Marshall N, Fu RR, et al. Vaginal birth after cesarean: new insights. Evidence Report Technology Assessment (Full Report) 2010(191):1-397.
5. Dodd JM, Crowther CA, Huertas E, Guise JM, Horey D. Planned elective repeat caesarean section versus planned vaginal birth for women with a previous caesarean birth. Cochrane Database of Systematic Reviews. [Internet]. 2013 [cited 2019 Dec 10]; Issue 12. Art No.: CD004224 DOI:10.1002/14651858.CD004224.pub3.
6. Crowther CA, Dodd JM, Hiller JE, Haslam RR, Robinson JS. Planned vaginal birth or elective repeat caesarean: patient preference restricted cohort with nested randomised trial. PLoS Med 2012;9(3):e1001192.
7. Gardner K, Henry A, Thou S, Davis G, Miller T. Improving VBAC rates: the combined impact of two management strategies. Australian and New Zealand Journal of Obstetrics and Gynaecology 2014;54(4):327-32.
8. Fitzpatrick KE, Kurinczuk JJ, Bhattacharya S, Quigley MA. Planned mode of delivery after previous cesarean section and short-term maternal and perinatal outcomes: A population-based record linkage cohort study in Scotland. PLoS Medicine 2019;16(9):e1002913.
9. Dekker GA, Chan A, Luke CG, Priest K, Riley M, Halliday J, et al. Risk of uterine rupture in Australian women attempting vaginal birth after one prior caesarean section: a retrospective population-based cohort study. BJOG An International of Obstetrics and Gynaecology 2010;117(11):1358-65.
10. Dy J, DeMeester S, Lipworth H, Barrett J. No. 382-Trial of labour after caesarean. Journal of Obstetrics and Gynaecology Canada 2019;41(7):992-1011.
11. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Birth after previous caesarean section. College Statement C-Obs 38. [Internet]. 2019 [cited 2019 Dec 10]. Available from: http://www.ranzcog.edu.au.
12. Sentilhes L, Vayssiere C, Beucher G, Deneux-Tharaux C, Deruelle P, Diemunsch P, et al. Delivery for women with a previous cesarean: guidelines for clinical practice from the French College of Gynecologists and Obstetricians (CNGOF). European Journal of Obstetrics and Gynecology and Reproductive Biololgy 2013;170(1):25-32.
13. Yeh J, Wactawski-Wende J, Shelton JA, Reschke J. Temporal trends in the rates of trial of labor in low-risk pregnancies and their impact on the rates and success of vaginal birth after cesarean delivery. American Journal of Obstetrics and Gynecology 2006;194(1):144.
14. Foureur M, Turkmani S, Clack DC, Davis DL, Mollart L, Leiser B, et al. Caring for women wanting a vaginal birth after previous caesarean section: A qualitative study of the experiences of midwives and obstetricians. Women and Birth 2017;30(1):3-8.
15. Homer CS, Besley K, Bell J, Davis D, Adams J, Porteous A, et al. Does continuity of care impact decision making in the next birth after a caesarean section (VBAC)? A randomised controlled trial. BMC Pregnancy and Childbirth 2013;13:140.
16. Queensland Health. Perinatal data collection: 2016 to 2018. Statistical Services Branch. 2019.
17. Queensland Health. Queensland mothers and babies 2016 and 2017: report of the Queensland Maternity and Perinatal Quality Council 2019. [Internet]. 2019 [cited 2019 Dec 19]. Available from: http://www.health..qld.gov.au.
18. Queensland Health. Clinical Services Capability Framework for Public and Licensed Private Health Facilities v3.2. [Internet]. 2014 [cited 2018 June 26]. Available from: https://www.health.qld.gov.au
19. National Institue for Health and Care Excellence. Caesarean Section CG132: NICE guideline. [Internet]. 2019 [cited 2020 Jun 16]. Available from: http://www.nice.org.uk.
20. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Categorisation of urgency for caesarean section. College Statement C-Obs 14. [Internet]. 2019 [cited 2019 Dec 19]. Available from: http://www.ranzcog.edu.au.
21. Simkin P, Stewart M, Shearer B, Christopher Glantz J, Rooks JP, Lyerly AD, et al. The language of birth. Birth 2012;39(2):156-64.
22. Young CB, Liu S, Muraca GM, Sabr Y, Pressey T, Liston RM, et al. Mode of delivery after a previous cesarean birth, and associated maternal and neonatal morbidity. CMAJ 2018;190(18):E556-E64.
23. Cunningham FG, Bangdiwala SI, Brown SS, Dean TM, Frederiksen M, Rowland Hogue CJ, et al. NIH consensus development conference draft statement on vaginal birth after cesarean: new insights. InNational Institutes of Health Consensus Development Conference 2010;27(3):1-42.
24. Rossi AC, D'Addario V. Maternal morbidity following a trial of labor after cesarean section vs elective repeat cesarean delivery: a systematic review with metaanalysis. American Journal of Obstetrics and Gynecology 2008;199(3):224-31.
25. American College of Obstetricians. ACOG Practice Bulletin No. 205: Vaginal birth after cesarean delivery. Obstetrics and Gynecology 2019;133(2):e110-e27.
26. Fitzpatrick KE, Kurinczuk JJ, Alfirevic Z, Spark P, Brocklehurst P, Knight M. Uterine rupture by intended mode of delivery in the UK: a national case-control study. PLoS Medicine 2012;9(3):e1001184.
27. Lundgren I, Begley C, Gross MM, Bondas T. 'Groping through the fog': a metasynthesis of women's experiences on VBAC (vaginal birth after caesarean section). BMC Pregnancy and Childbirth 2012;12:85.
28. Regan J, Thompson A, DeFranco E. The influence of mode of delivery on breastfeeding initiation in women with a prior cesarean delivery: a population-based study. Breastfeeding Medicine 2013;8:181-6.
29. Chen C, Yan Y, Gao X, Xiang S, He Q, Zeng G, et al. Influences of cesarean delivery on breastfeeding practices and duration: a prospective cohort study. Journal of Human Lactation 2018;34(3):526-34.
30. Zanardo V, Savona V, Cavallin F, D'Antona D, Giustardi A, Trevisanuto D. Impaired lactation performance following elective delivery at term: role of maternal levels of cortisol and prolactin. Journal of Maternal-Fetal and Neonatal Medicine 2012;25(9):1595-8.
31. Manresa M, Pereda A, Bataller E, Terre-Rull C, Ismail KM, Webb SS. Incidence of perineal pain and dyspareunia following spontaneous vaginal birth: a systematic review and meta-analysis. International Urogynecology Journal 2019;30(6):853-68.
32. Elvander C, Ahlberg M, Edqvist M, Stephansson O. Severe perineal trauma among women undergoing vaginal birth after cesarean delivery: a population-based cohort study. Birth 2019;46(2):379-86.
33. Queensland Clinical Guidelines. Perineal care. Guideline No. MN18.30-V3-R23. [Internet]. Queensland Health. 2018. [cited 2020 Aug 31]. Available from: http://www.health.qld.gov.au
34. Hehir MP, Fitzpatrick M, Cassidy M, Murphy M, O'Herlihy C. Are women having a vaginal birth after a previous caesarean delivery at increased risk of anal sphincter injury? BJOG An International of Obstetrics and Gynaecology 2014;121(12):1515-20.

35. Jardine JE, Knight HE, Carroll FE, Gurol-Urganci I. Risk of obstetric anal sphincter injury in women having a vaginal birth after a previous caesarean section: A population-based cohort study. European Journal of Obstetrics and Gynecology and Reproductive Biololgy 2019;236:7-13.
36. Raisanen S, Vehvilainen-Julkunen K, Cartwright R, Gissler M, Heinonen S. A prior cesarean section and incidence of obstetric anal sphincter injury. International Urogynecology Journal 2013;24(8):1331-9.
37. Faranesh R, Salim R. Labor progress among women attempting a trial of labor after cesarean. Do they have their own rules? Acta obstetricia et gynecologica Scandinavica 2011;90(12):1386-92.
38. Queensland Clinical Guidelines. Instrumenal vaginal birth. Guideline No. MN18.49-V1-R23. [Internet]. Queensland Health. 2018. [cited 2020 Aug 31]. Available from: http://www.health.qld.gov.au
39. Smith GC, Pell JP, Dobbie R. Caesarean section and risk of unexplained stillbirth in subsequent pregnancy. The Lancet 2003;362(9398):1779-84.
40. Landon MB, Hauth JC, Leveno KJ, Spong CY, Leindecker S, Varner MW, et al. Maternal and perinatal outcomes associated with a trial of labor after prior cesarean delivery. New England Journal of Medicine 2004;351(25):2581-9.
41. Rortveit G, Hannestad YS. Association between mode of delivery and pelvic floor dysfunction. Tidsskrift for Den Norske Legeforening 2014;134(19):1848-52.
42. Prior E, Santhakumaran S, Gale C, Philipps LH, Modi N, Hyde MJ. Breastfeeding after cesarean delivery: a systematic review and meta-analysis of world literature. The American Jounral of Clinical Nutrition 2012;95(5):1113-35.
43. Marshall NE, Fu R, Guise JM. Impact of multiple cesarean deliveries on maternal morbidity: a systematic review. American Journal of Obstetrics and Gynecology 2011;205(3):262 e1-8.
44. de la Cruz CZ, Thompson EL, O'Rourke K, Nembhard WN. Cesarean section and the risk of emergency peripartum hysterectomy in high-income countries: a systematic review. Archives of Gynecology and Obstetrics 2015;292(6):1201-15.
45. Lopez E, Patkai J, El Ayoubi M, Jarreau PH. Benefits and harms to the newborn of maternal attempt at trial of labor after prior caesarean versus elective repeat caesarean delivery. Journal de Gynecologie, Obstetrique et Biologie de la Reproduction 2012;41(8):727-34.
46. Stutchfield P, Whitaker R, Russell I. Antenatal betamethasone and incidence of neonatal respiratory distress after elective caesarean section: pragmatic randomised trial. BMJ 2005;331(7518):662.
47. Zhang T, Liu C. Comparison between continuing midwifery care and standard maternity care in vaginal birth after cesarean. Pakistan Jounral of Medical Sciences 2016;32(3):711-4.
48. Darling E. Vaginal birth after cesarean section: outcomes of women receiving midwifery care in Ontario. Canadian Journal of Midwifery Research and Practice 2011;10(1):9-19.
49. Wu Y, Kataria Y, Wang Z, Ming WK, Ellervik C. Factors associated with successful vaginal birth after a cesarean section: a systematic review and meta-analysis. BMC Pregnancy and Childbirth 2019;19(1):360.
50. Boisen AB, Lokkegaard EC, Fuglsang J. Double-balloon catheter for induction of labor in 362 women with and without prior cesarean section. European Journal of Obstetrics and Gynecology and Reproductive Biololgy 2019;4:100033.
51. Australian College of Midwives. National midwifery guidelines for consultation and referral 3rd (ed) Issue 2. 2014.
52. Queensland Clinical Guidelines. Standard care. Guideline No. MN18.50-V1-R23. [Internet]. Queensland Health. 2018. [cited 2020 Aug 31]. Available from: http://www.health.qld.gov.au
53. Clinical Excellence Queensland. Guideline: Parntering with the woman who declines recommended maternity care, V1.0. [Internet]. 2020 [cited 2020 Sep 14]. Available from: http://www.health.qld.gov.au.
54. Nilsson C, Lundgren I, Smith V, Vehvilainen-Julkunen K, Nicoletti J, Devane D, et al. Women-centred interventions to increase vaginal birth after caesarean section (VBAC): A systematic review. Midwifery 2015;31(7):657-63.
55. Horey D, Kealy M, Davey MA, Small R, Crowther CA. Interventions for supporting pregnant women's decision-making about mode of birth after a caesarean. Cochrane Database of Systematic Reviews. [Internet]. 2013 [cited 2020 Sep 14]; Issue 7. Art No.: CD010041 DOI:10.1002/14651858.CD010041.pub2.
56. Say R, Robson S, Thomson R. Helping pregnant women make better decisions: a systematic review of the benefits of patient decision aids in obstetrics. BMJ Open 2011;1(2):e000261.
57. David S, Fenwick J, Bayes S, Martin T. A qualitative analysis of the content of telephone calls made by women to a dedicated 'Next Birth After Caesarean' antenatal clinic. Women and Birth 2010;23(4):166-71.
58. Fox NS. Pregnancy Outcomes in Patients With Prior Uterine Rupture or Dehiscence: A 5-Year Update. Obstetrics and Gynecology 2020;135(1):211-2.
59. Al Qahtani NH, Al Hajeri F. Pregnancy outcome and fertility after complete uterine rupture: a report of 20 pregnancies and a review of literature. Archives of Gynecology and Obstetrics 2011;284(5):1123-6.
60. Greene RA, Fitzpatrick C, Turner MJ. What are the maternal implications of a classical caesarean section? Journal of Obstetrics and Gynaecology 1998;18(4):345-7.
61. Shipp TD, Zelop CM, Repke JT, Cohen A, Caughey AB, Lieberman E. Intrapartum uterine rupture and dehiscence in patients with prior lower uterine segment vertical and transverse incisions. Obstetrics and Gynecology 1999;94(5 Pt 1):735-40.
62. Naef RW, 3rd, Ray MA, Chauhan SP, Roach H, Blake PG, Martin JN, Jr. Trial of labor after cesarean delivery with a lower-segment, vertical uterine incision: is it safe? American Journal of Obstetrics and Gynecology 1995;172(6):1666-73; discussion 73-4.
63. Smith D, Stringer E, Vladutiu CJ, Zink AH, Strauss R. Risk of uterine rupture among women attempting vaginal birth after cesarean with an unknown uterine scar. American Journal of Obstetrics and Gynecology 2015;213(1):80 e1- e5.
64. Durnwald C, Mercer B. Uterine rupture, perioperative and perinatal morbidity after single-layer and double-layer closure at cesarean delivery. American Journal of Obstetrics and Gynecology 2003;189(4):925-9.
65. Bujold E, Mehta SH, Bujold C, Gauthier RJ. Interdelivery interval and uterine rupture. American Journal of Obstetrics and Gynecology 2002;187(5):1199-202.
66. Bujold E, Gauthier RJ. Risk of uterine rupture associated with an interdelivery interval between 18 and 24 months. Obstetrics and Gynecology 2010;115(5):1003-6.
67. Al-Zirqi I, Daltveit AK, Forsen L, Stray-Pedersen B, Vangen S. Risk factors for complete uterine rupture. American Journal of Obstetrics and Gynecology 2017;216(2):165 e1- e8.
68. Ye L, Cao W, Yao J, Peng G, Zhou R. Systematic review of the effects of birth spacing after cesarean delivery on maternal and perinatal outcomes. International Journal of Gynecology and Obstetrics 2019;147(1):19-28.
69. Kessous R, Tirosh D, Weintraub AY, Benshalom-Tirosh N, Sergienko R, Sheiner E. Second stage disorders in patients following a previous cesarean section: vacuum versus repeated cesarean section. Archives of Gynecology and Obstetrics 2013;287(6):1075-9.
70. Cunningham S, Algeo CE, DeFranco EA. Influence of interpregnancy interval on uterine rupture. The Journal of Maternal-Fetal Neonatal Medicine 2019:1-6.
71. Esposito MA, Menihan CA, Malee MP. Association of interpregnancy interval with uterine scar failure in labor: a case-control study. American Journal of Obstetrics and Gynecology 2000;183(5):1180-3.
72. Stamilio DM, DeFranco E, Pare E, Odibo AO, Peipert JF, Allsworth JE, et al. Short interpregnancy interval: risk of uterine rupture and complications of vaginal birth after cesarean delivery. Obstetrics and Gynecology 2007;110(5):1075-82.

73. Kessous R, Sheiner E. Is there an association between short interval from previous cesarean section and adverse obstetric and perinatal outcome? The Journal of Maternal-Fetal & Neonatal Medicine 2013;26(10):1003-6.
74. Shipp TD, Zelop CM, Repke JT, Cohen A, Lieberman E. Interdelivery interval and risk of symptomatic uterine rupture. Obstetrics and Gynecology 2001;97(2):175-7.
75. DeFranco EA, Stamilio DM, Boslaugh SE, Gross GA, Muglia LJ. A short interpregnancy interval is a risk factor for preterm birth and its recurrence. American Journal of Obstetrics and Gynecology 2007;197(3):264 e1-6.
76. Huang WH, Nakashima DK, Rumney PJ, Keegan KA, Jr., Chan K. Interdelivery interval and the success of vaginal birth after cesarean delivery. Obstetrics and Gynecology 2002;99(1):41-4.
77. Cahill AG, Tuuli M, Odibo AO, Stamilio DM, Macones GA. Vaginal birth after caesarean for women with three or more prior caesareans: assessing safety and success. BJOG An International of Obstetrics and Gynaecology 2010;117(4):422-7.
78. Macones GA, Cahill A, Pare E, Stamilio DM, Ratcliffe S, Stevens E, et al. Obstetric outcomes in women with two prior cesarean deliveries: is vaginal birth after cesarean delivery a viable option? American Journal of Obstetrics and Gynecology 2005;192(4):1223-8; discussion 8-9.
79. Spaans WA, van der Vliet LM, Roell-Schorer EA, Bleker OP, van Roosmalen J. Trial of labour after two or three previous caesarean sections. European Journal of Obstetrics and Gynecology and Reproductive Biololgy 2003;110(1):16-9.
80. Tahseen S, Griffiths M. Vaginal birth after two caesarean sections (VBAC-2)-a systematic review with meta-analysis of success rate and adverse outcomes of VBAC-2 versus VBAC-1 and repeat (third) caesarean sections. BJOG: An International Journal of Obstetrics and Gynaecology 2010;117(1):5-19.
81. Kehl S, Weiss C, Rath W. Balloon catheters for induction of labor at term after previous cesarean section: a systematic review. European Journal of Obstetrics and Gynecology and Reproductive Biololgy 2016;204:44-50.
82. West HM, Jozwiak M, Dodd JM. Methods of term labour induction for women with a previous caesarean section. Cochrane Database of Systematic Reviews. [Internet]. 2017 [cited 2020 Jun 9]; Issue 6. Art No.: CD009792 DOI:10.1002/14651858.CD009792.pub3.
83. de Vaan MD, Ten Eikelder ML, Jozwiak M, Palmer KR, Davies-Tuck M, Bloemenkamp KW, et al. Mechanical methods for induction of labour. Cochrane Database of Systematic Reviews. [Internet]. 2019 [cited 2019 Oct 18]; Issue 10. Art No.: CD001233 DOI:10.1002/14651858.CD001233.pub3.
84. Du YM, Zhu LY, Cui LN, Jin BH, Ou JL. Double-balloon catheter versus prostaglandin E2 for cervical ripening and labour induction: a systematic review and meta-analysis of randomised controlled trials. BJOG An International of Obstetrics and Gynaecology 2017;124(6):891-9.
85. Huisman CMA, Ten Eikelder MLG, Mast K, Oude Rengerink K, Jozwiak M, van Dunne F, et al. Balloon catheter for induction of labor in women with one previous cesarean and an unfavorable cervix. Acta obstetricia et gynecologica Scandinavica 2019;98(7):920-8.
86. Cahill AG, Stamilio DM, Odibo AO, Peipert JF, Stevens EJ, Macones GA. Does a maximum dose of oxytocin affect risk for uterine rupture in candidates for vaginal birth after cesarean delivery? American Journal of Obstetrics and Gynecology 2007;197(5):495 e1-5.
87. Cahill AG, Waterman BM, Stamilio DM, Odibo AO, Allsworth JE, Evanoff B, et al. Higher maximum doses of oxytocin are associated with an unacceptably high risk for uterine rupture in patients attempting vaginal birth after cesarean delivery. American Journal of Obstetrics and Gynecology 2008;199(1):32 e1-5.
88. National Institue for Health and Care Excellence. Intrapartum care for women with existing medical complications or obstetric complications and their babies NG121: NICE guideline. [Internet]. 2019 [cited 2020 Jun 16]. Available from: http://www.nice.org.uk.
89. Queensland Clinical Guidelines. Intrapartum fetal surveillance. Guideline No. MN19.15-V7-R24. [Internet]. Queensland Health. 2015. [cited 2020 Aug 31]. Available from: http://www.health.qld.gov.au
90. Australian Commission on Safety and Quality in Health Care. National consensus statement: essential elements for recognising and responding to clinical deterioration. [Internet]. 2012; (cited 2017 July 5). Available from: http://www.safetyandquality.gov.au.
91. Queensland Clinical Guidelines. Normal birth. Guideline No. MN17.25-V3-R22. [Internet]. Queensland Health. 2017. [cited 2020 Aug 31]. Available from: http://www.health.qld.gov.au
92. Grisaru-Granovsky S, Bas-Lando M, Drukker L, Haouzi F, Farkash R, Samueloff A, et al. Epidural analgesia at trial of labor after cesarean (TOLAC): a significant adjunct to successful vaginal birth after cesarean (VBAC). Journal of Perinatal Medicine 2018;46(3):261-9.
93. Queensland Clinical Guidelines. Epidural in labour. Guideline No. MN17.41-V1-R22. [Internet]. Queensland Health. 2017. [cited Available from: http://www.health.qld.gov.au
94. Grobman WA, Lai Y, Landon MB, Spong CY, Leveno KJ, Rouse DJ, et al. Prediction of uterine rupture associated with attempted vaginal birth after cesarean delivery. American Journal of Obstetrics and Gynecology 2008;199(1):30 e1-5.
95. Zelop CM, Shipp TD, Repke JT, 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 and Gynecology 2000;183(5):1184-6.
96. Guiliano M, Closset E, Therby D, LeGoueff F, Deruelle P, Subtil D. Signs, symptoms and complications of complete and partial uterine ruptures during pregnancy and delivery. European Journal of Obstetrics and Gynecology and Reproductive Biololgy 2014;179:130-4.
97. Revicky V, Muralidhar A, Mukhopadhyay S, Mahmood T. A case series of uterine rupture: lessons to be learned for future clinical practice. The Journal of Obstetrics and Gynecology of India 2012;62(6):665-73.
98. Nahum G. Uterine rupture in pregnancy. [Internet]. 2015 [cited 2015 Apr 2]. Available from: http://www.reference.medscape.com.
99. Jastrow N, Roberge S, Gauthier RJ, Laroche L, Duperron L, Brassard N, et al. Effect of birth weight on adverse obstetric outcomes in vaginal birth after cesarean delivery. Obstetrics and Gynecology 2010;115(2 Pt 1):338-43.
100. Royal College of Obstetricians and Gynaecologists. Late intrauterine fetal death and stillbirth. Green-top Guideline, No. 55. 2010 [cited 2020 Feb 27]. Available from: http://www.rcog.org.uk.
101. Chakhtoura NA, Reddy UM. Management of stillbirth delivery. Semin Perinatol 2015;39(6):501-4.
102. Queensland Clinical Guidelines. Stillbirth care. Guideline No. MN18.24-V6-R23. [Internet]. Queensland Health. 2018. [cited 2020 Aug 31]. Available from: http://www.health.qld.gov.au

Appendix A: Example VBAC counselling checklist

An example checklist which can be used by clinicians when counselling women about birth after previous CS.

Contraindications for VBAC			**Tick when discussed**
Contraindications include: previous uterine rupture; history of classical caesarean section; contraindications to vaginal birth which apply regardless of history of caesarean (e.g. placenta praevia)			☐
If complex caesarean scar (e.g. inverted T or J), or history of multiple caesarean sections, seek expert advice			☐
Likelihood of VBAC		**VBAC rate**	
One previous caesarean section, no previous vaginal birth		72–75%*	☐
One previous caesarean section, at least one previous vaginal birth		85–90%*	☐
Induced labour, no previous vaginal birth, BMI greater than 30, previous caesarean for dystocia.		If all factors present, 40%	☐
***Maternal* risks of planned VBAC and ERCS**			
Risk	**Planned VBAC**	**ERCS**	
Uterine rupture*	0.5%	<0.02%	☐
**If uterine rupture occurs, 14–33% risk of hysterectomy and 6.2% risk of perinatal death*			
Serious complications in future pregnancies	Not applicable if VBAC	Increased likelihood of placenta praevia/morbidly adherent placenta	☐
Maternal mortality	0.004%	0.013%	☐
***Fetal* risks of VBAC and ERCS**			
Risk	**Planned VBAC**	**ERCS**	
Antepartum stillbirth beyond 39+0 weeks awaiting labour	0.1%	Not applicable if ERCS at 39 weeks	☐
Hypoxic ischaemic encephalopathy (HIE)	0.08%	<0.01%	☐
Perinatal mortality	0.13%	0.05%	☐
Intrapartum care recommendations			
Recommended continuous electronic fetal monitoring in labour			☐
One-on-one midwifery care			☐
Birth in suitable facility			☐
Written information leaflets provided: VBAC ☐ ERCS ☐ Other ☐			

Adapted from: Royal College of Obstetricians and Gynaecologists. Birth after previous caesarean birth: Green-top guideline no. 45. [Internet]. 2015 [cited 2019 Dec 17]. Available from: http://www.rcog.org.uk.

Appendix B: Example management plan checklist

Example plan which can be completed by clinician and woman to document plan for birth and potential circumstances which may arise.

<table>
<tr><th colspan="4">Management plan in the event of…</th></tr>
<tr><td>Preterm labour</td><td>☐ VBAC</td><td colspan="2">☐ Emergency CS</td></tr>
<tr><td>Spontaneous labour before ERCS date</td><td>☐ VBAC</td><td>☐ Emergency CS</td><td>☐ Depends on situation
Provide details:</td></tr>
<tr><td rowspan="3">No spontaneous labour by 41 weeks</td><td colspan="3">☐ Induction of labour

Provide details below in induction of labour row</td></tr>
<tr><td colspan="3">☐ ERCS

Provide details:</td></tr>
<tr><td colspan="3">☐ Expectant management

Provide details:</td></tr>
<tr><td>Details of induction of labour</td><td colspan="3"></td></tr>
<tr><td>Use of oxytocin in labour</td><td colspan="3"></td></tr>
<tr><td>ERCS booking details</td><td colspan="3"></td></tr>
<tr><td>Additional comments</td><td colspan="3"></td></tr>
</table>

Adapted from: Royal College of Obstetricians and Gynaecologists. Birth after previous caesarean birth: Green-top guideline no. 45. [Internet]. 2015 [cited 2019 Dec 17]. Available from: http://www.rcog.org.uk.

Acknowledgements

Queensland Clinical Guidelines gratefully acknowledge the contribution of Queensland clinicians and other stakeholders who participated throughout the guideline development process particularly:

Working Party Clinical Leads

Dr Marc Miller, Director Obstetrics and Gynaecology, Sunshine Coast University Hospital
Ms Janene Rattray, Midwifery Educator, Caboolture Hospital

QCG Program Officer

Ms Cara Cox

Working Party Members

Ms Rukhsana Aziz, Clinical Midwifery Consultant, Ipswich Hospital
Ms Lily Batterham, Registered Midwife, Townsville University Hospital
Mrs Josephine Bell, Registered Midwife, Stanthorpe Hospital
Dr Margaret Bickerstaff, Obstetrician, Bundaberg Hospital
Dr Elize Bolton, Clinical Director, Bundaberg Hospital
Mrs Anne Bousfield, Clinical Midwifery Consultant, South West Hospital Health Service
Dr Gabrielle Brailsford, Resident Medical Officer, Royal Brisbane and Women's Hospital
Miss Laura Brassey, Registered Midwife, Mater Mothers' Hospital
Mrs Sally Brunton, Registered Midwife, Mater Mother's Hospital
Mrs Sara Carter, Registered Midwife, Royal Brisbane and Women's Hospital
Ms Nicole Chappell, Registered Midwife/Nurse, Logan Hospital
Mrs Elizabeth Clarke, Clinical Development Facilitator, Ipswich Hospital
Dr Lindsay Cochrane, Obstetrician, Caboolture Hospital
Ms Jeanie Cooper, Registered Midwife, Redcliffe Hospital
Mrs Catherine Cooper, Midwifery Unit Manager, Mater Mothers' Hospital
Mrs Jo Costello, Midwifery Unit Manager, Mater Mothers' Hospital
Mrs Allison Davis, Clinical Midwife/Nurse, Mackay Base Hospital
Mrs Victoria De Araujo, Practice Development Midwife, Gold Coast University Hospital
Mrs Carole Dodd, Registered Midwife/Nurse, Caboolture Hospital
Mrs Leah Ebert, Clinical Midwife/Facilitator, Redcliffe Hospital
Dr Kylie Edwards, Staff Specialist, Obstetrics and Gynaecology, Bundaberg Hospital
Ms Judy Foote, Registered Nurse/Midwife, Townsville University Hospital
Ms Jen Fry, Registered Midwife, Beaudesert Hospital
Ms Rebecca Godfrey, Student Midwife, Gold Coast University Hospital
Miss Emily Godfrey, Registered Midwife, Gold Coast University Hospital
Dr Nelson Gonzalez, Obstetrician, Gold Coast University Hospital
Dr Leigh Grant, Obstetrics and Gynaecology Senior Medical Officer, Rockhampton Hospital
Ms Marnie Griffiths, Midwifery Lecturer, Griffith University
Ms Jacqueline Griffiths, Acting Regional Maternity Services Coordinator, Cairns Hospital
Mrs Marnina Hales, Registered Nurse/Midwife, Logan Hospital
Mrs Marie Hall, Associate Clinical Nurse Consultant, Central Queensland Hospital Health Service
Mrs Shonel Hall, Registered Midwife, Logan Hospital
Mrs Annie Hampson, Clinical Midwife, Redland Hospital
Miss Jane Hitchcock, Registered Midwife, Redlands Hospital
Dr Janelle James-McAlpine, Clinical Midwife, Cairns Hospital
Dr Shveta Kapoor, Obstetrician, Ipswich Hospital
Ms Frances Keemer, Registered Midwife, Kingaroy Hospital
Mrs Courtney Kelly, Registered Midwife, Royal Brisbane and Women's Hospital
Mrs Sarah Kirby, Midwifery Unit Manager, Royal Brisbane and Women's Hospital
Ms Janelle Laws, Nurse Educator, Metro North Hospital and Health Service
Mrs Gemma MacMillan, Director of Midwifery, Torres and Cape Hospital and Health Service
Mrs Amelia Mason, Registered Midwife, Redland Hospital
Ms Cara Masterson, Physiotherapist, Royal Brisbane and Women's Hospital
Ms Jac Matyear, Clinical Midwife, Ipswich Hospital
Dr Alison McDougall, Obstetrics and Gynaecology Registrar, Mater Mothers' Hospital
Ms Melissa Megaw, Midwifery Educator, Gladstone Hospital
Ms Donna Milburn, Clinical Midwife Consultant, Toowoomba Hospital
Dr Min Min Moe, Obstetrics Senior Medical officer, Cooktown Multipurpose Health Service
Ms Ann-Marie Murphy, Midwifery Group Practice Midwife, Logan Hospital
Mrs Sandra Penman, Registered Midwife, Gold Coast University Hospital
Dr Samuel Petersen, Senior Medical officer, Warwick Hospital

Dr Scott Petersen, Staff Specialist, Mater Mothers' Hospital
Dr Jane Reeves, Obstetrician Gynaecologist, Sunshine Coast University Hospital
Dr Thangeswaran Rudra, Senior Staff Specialist, Royal Brisbane and Women's Hospital
Dr Kathryn Saba, Obstetrician, Royal Brisbane and Women's Hospital
Ms Pamela Sepulveda, Clinical Midwifery Consultant, Logan Hospital
Mrs Elizabeth Shepherd, Registered Nurse/Midwife, Mater Education Limited
Ms Alecia Staines, Consumer Representative, Maternity Consumer Network
Ms Kelly Stegmann, Registered Midwife, Logan Hospital
Miss Emilie Stevens, Registered Midwife, Royal Brisbane and Women's Hospital
Mrs Melinda Stevenson, Registered Midwife, Redland Hospital
Dr Keisuke Tanaka, Staff Specialist, Obstetrics and Gynaecology, Royal Brisbane and Women's Hospital
Mrs Rhonda Taylor, Clinical Midwifery Consultant, The Townsville Hospital
Mrs Bethan Townsend, Clinical Midwife, Midwifery Group Practice, Sunshine Coast University Hospital
Mrs Sally Tumaru, Clinical Midwife, Biloela Hospital
Mrs Elizabeth Upton, Clinical Pharmacist, Sunshine Coast University Hospital
Dr Luke Waldrip, Staff Specialist Obstetrician, Gold Coast University Hospital
Ms Alison Weatherstone, Maternity Unit Manager, Innisfail Hospital
Mrs Mia Zimmerman, Registered Midwife, Redland Hospital

Queensland Clinical Guidelines Team

Professor Rebecca Kimble, Director
Ms Jacinta Lee, Manager
Ms Cara Cox, Clinical Nurse Consultant
Ms Stephanie Sutherns, Clinical Nurse Consultant
Ms Emily Holmes, Clinical Nurse Consultant
Steering Committee

Funding

This clinical guideline was funded by Healthcare Improvement Unit, Queensland Health