Category: Clinical Guidance Statement

C-Obs 37 Delivery of fetus at caesarean birth

This statement has been updated in response to changes in available evidence, including the retraction of a key study. The interim update of the statement provides guidance on delivery of a fetus at caesarean birth, approved by the Women's Health Committee, RANZCOG Council and Board.

A list of the Women's Health Committee membership can be found in Appendix A.

Conflict of Interest disclosures were received from all members of this Committee (Appendix C).

Disclaimer: This information is intended to provide general advice to practitioners. This information should not be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of any patient. This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The document has been prepared having regard to general circumstances (Appendix D).

First developed by RANZCOG: July 2010
Current version: November 2019, with interim update November 2023
Review due: November 2024

Objectives:	To provide guidance regarding the consequences, delivery principles and considerations for delivery of a fetus at caesarean birth.
Target audience:	This statement was developed primarily for use by registered health practitioners providing care to women[1] in maternity care.
Background:	The statement was first published in July 2010 and reviewed in November 2013 and again in November 2019. The most recent interim update of this statement is in response to retracted evidence that inflatable devices might reduce the risk of uterine injury in these circumstances. The statement draws on earlier evidence-based methodology (i.e. not GRADE methodology) (Appendix C).
Funding:	The development and review of this statement was funded by RANZCOG.

[1] *RANZCOG currently uses the term 'woman' in its documents to include all individuals needing obstetric and gynaecological healthcare, regardless of their gender identity. The College is firmly committed to inclusion of all individuals needing O&G care, as well as all its members providing care, regardless of their gender identity.*

Contents

1. Plain language summary

Caesarean birth is a safe procedure. However, just as there is a chance of injury to mother or baby during a vaginal birth, there is a risk of injury to mother or baby during a caesarean birth. The risks are highest when the baby's head is deep in the mother's birth canal at the time of caesarean birth, when the baby is very large, or sometimes when the baby is in a breech presentation.

2. Purpose and scope

The purpose of this statement is to provide guidance for doctors who perform caesarean births about how best to deliver babies in these circumstances.

3. Terminology

The statement has been updated using contemporary terminology that is identified as being acceptable to consumers (Re:Birth survey UK, 2023) including but not limited to, the use of caesarean birth (in place of caesarean section).

4. Table of recommendations

Recommendation 1	Grade
Obstetricians should be aware of certain circumstances that can increase the risk of fetal injury at caesarean birth, for example • presenting part is deep in the pelvis, • the fetus is macrosomic, • the fetus is in a malpresentation such as a breech presentation.	Consensus-based recommendation
Recommendation 2	**Grade**
Where an impacted fetal head is suspected, the most senior obstetric doctor present should perform a vaginal examination immediately before commencing a caesarean birth to exclude the possibility of further descent of the presenting part such that vaginal birth would be more easily accomplished.	Consensus-based recommendation
Recommendation 3	**Grade**
Clinicians experienced in caesarean births and trained in neonatal resuscitation should be in attendance or readily available where a technically difficult delivery is anticipated.	Consensus-based recommendation
Recommendation 4	**Grade**
The obstetrician should consider measures to decrease the risk of injury at the time of caesarean birth.	Consensus-based recommendation
Recommendation 5	**Grade**
Consideration should be given to incorporating difficult caesarean birth scenarios into obstetric emergency training with both maternity and theatre teams including disimpaction of the fetal head at caesarean birth.	Consensus-based recommendation

5. Introduction

The overall risk of fetal injury at caesarean birth is low. Nevertheless, there is potential for fetal injury at caesarean birth in certain circumstances. These injuries include:

1. Skull fracture and/or intracranial haemorrhage following disimpaction where the head is deep in the pelvis.
2. Brachial plexus palsy following difficult delivery of the shoulders in the presence of fetal macrosomia.
3. Cervical spine, spinal cord and/or vertebral artery injury following delivery of the after coming head of a breech presentation.

6. Discussion and recommendations

Recommendation 1	Grade
Obstetricians should be aware of certain circumstances that can increase the risk of fetal injury at caesarean birth, for example • presenting part is deep in the pelvis, • the fetus is macrosomic, • the fetus is in a malpresentation such as a breech presentation.	Consensus-based recommendation
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Recommendation 4	**Grade**
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Recommendation 5	**Grade**
Consideration should be given to incorporating difficult caesarean birth scenarios into obstetric emergency training with both maternity and theatre teams including disimpaction of the fetal head at caesarean birth.	Consensus-based recommendation

6.1. Caesarean birth with the fetal head deep in the pelvis

Consequences

Where delivery needs to be expedited with the presenting part deep in the pelvis, there are added risks of caesarean birth including increased risks of:

1. Fetal Injury including skull fracture and/or intracranial haemorrhage.
2. Maternal injury including:
    - tears in the lower uterus;
    - haemorrhage;
    - urinary tract injury.

Delivery Principles

The decision for caesarean birth in the second stage of labour involves balancing the risks and benefits of a) caesarean birth against those of b) an immediate, and potentially difficult, operative vaginal birth or c) expectant management with the expectation of achieving a safer station or position for operative vaginal birth. All options carry some risk, and the decision should be made by an experienced accoucheur, preferably with adequate notice of progress in labour, fetal condition and maternal wishes.

If a decision is made to proceed with caesarean birth, the following good practice points are recommended.

Pre-operative considerations

1. A vaginal examination should be performed by the most senior obstetric doctor present immediately prior to commencing the procedure. This is to:
    - Exclude the possibility of further head descent such that vaginal birth would be more easily accomplished.
    - Apply steady firm upward pressure to assist with disimpaction of the fetal head and assist with the abdominal delivery. There is some evidence that inflatable devices might reduce the risk of uterine injury in these circumstances.
2. An experienced obstetrician and paediatrician should be in attendance or readily available where a technically difficult birth is anticipated.
3. The anaesthetist should be appropriately prepared in anticipation of the need for acute tocolysis and management of postpartum haemorrhage (PPH).

Intra-operative considerations

1. The head must be elevated into the abdomen before successful delivery can be accomplished. This may be achieved by either or both of:
    - Application of steady firm upward pressure with a cupped hand to assist with disimpaction of the fetal head and assist with the abdominal delivery. All efforts must be directed at avoiding the focused pressure of two fingers pushing on the head. There is conflicting, low-quality evidence that inflatable devices might be of modest clinical benefit in these circumstances[1-4] although the only published clinical trial of the intervention was retracted due to methodological concerns.[5] Administration of a tocolytic agent may be of benefit
    - Steady elevation of the fetal head vaginally by an experienced assistant.
    - The accoucheur's fingers passing between the head and the uterine wall to below the head and exerting upward pressure.

2. The upper uterine segment has invariably retracted, which results in a reduced intrauterine volume in which to accommodate the fetus as it is displaced upwards. While this is most commonly rectified by physical pressure associated with manual elevation of the fetal head, consideration should also be given to the use of tocolysis to relax the uterus. Commonly used agents for acute tocolysis include glyceryl trinitrate nitromin (GTN), salbutamol or terbutaline or deep general anaesthesia.

3. Occasionally, delivery of the fetal head is impossible despite these measures, and delivery of the torso through the uterine incision is appropriate. This may be particularly encountered in the very preterm fetus. While breech delivery in this setting has been the subject of case reports, it should generally only be performed by those experienced in this technique or where other methods have failed.

Post-operative considerations

The risk of major PPH is increased with emergency caesarean birth in advanced labour, due to the combination of uterine and vaginal trauma, infection, use of tocolysis and atony. Appropriate preparation for such a delivery includes considering the oxytocic and mechanical agents available to control haemostasis as well as availability of Tranexamic Acide, blood and blood products.

6.2. Caesarean birth and macrosomic fetus

Consequences

Caesarean birth for the macrocosmic fetus may still result in shoulder dystocia and brachial plexus palsy but with an incidence many times less than with vaginal birth.

Delivery principles

Where shoulder dystocia and fetal injury is anticipated, the abdominal wall and uterine incisions should be sufficiently large to facilitate delivery. Where difficulties are encountered during delivery, these may need to be extended:

1. To facilitate access for manoeuvres such as delivery of the posterior arm.
2. Converting the uterine incision into a 'J' or 'T' incision.

6.3. Delivery of the breech at caesarean birth

Consequences

While caesarean birth is generally associated with a reduction in fetal trauma when compared with vaginal birth, caesarean delivery of a breech presentation still poses some fetal risk related to trauma and asphyxia, and maternal risk of trauma.

1. Cervical spine, spinal cord and/or vertebral artery injury may follow delivery of the after coming head of a breech presentation. These injuries may follow hyperextension of the cervical spine while trying to facilitate delivery of the fetal head through the incision. It should be noted that:
    - These injuries may be more likely where the head is hyper-extended antenatally producing anomalous development of the cervical spine, or when fetal muscular tone is reduced through a neuromuscular disorder or fetal hypoxia.
    - Such injuries may also occur antenatally and are not necessarily the consequence of the delivery itself.
2. Maternal consequences of caesarean birth can be considerable if the breech is very deep in the pelvis such that vaginal breech delivery may be recommended. Trials recommending caesarean birth for breech presentation have not been powered to examine the subgroup with full cervical dilatation and the breech deep in the pelvis.

Pre-operative

High quality antenatal care is imperative for all women so that the incidence of "undiagnosed" breech presentations is minimised. This enables appropriate antenatal management of the term breech, including an ultrasound assessment to exclude fetal normality and hyperextension of the fetal head, and provides an opportunity to offer External Cephalic Version (ECV).

Intra-operative technique

1. Where an emergency caesarean birth is being undertaken for the breech presentation in labour, a further vaginal examination should always be performed in theatre immediately before embarking on the caesarean delivery in order to exclude imminent vaginal birth.

2. The key to successful birth of the after coming head of any breech presentation (whether abdominal or vaginal) is to maintain head flexion during delivery of the limbs and torso. Head extension not only makes head diameters much greater but also incurs the possibility of extension injuries.

3. The incision should be sufficiently large to allow access and the necessary manipulations. Head flexion should be maintained during delivery of the limbs and torso by the surgical assistant exerting pressure on the vertex in the appropriate direction.

4. When delivery of the after coming head does not occur with simple downward pressure on the uterine fundus, delivery of the after coming head should be effected when the head is low in the uterus by either:

    - A modification of the Mauriceau-Smellie-Veit manoeuvre; or
    - Obstetric forceps.

5. Where the fetal head is not sufficiently low OR initial attempts at delivery are unsuccessful, the accoucheur may consider:

    - Tocolysis administered by the anaesthetist may assist where there is a uterine retraction ring around the fetal neck, most commonly accomplished with GTN, salbutamol or terbutaline or deep general anaesthesia.
    - Extension of the uterine incision, most commonly upward in the midline in the form of an "inverted T-incision". Although undesirable for subsequent pregnancies, this may avoid fetal injury (traumatic or asphyxial) in this technically difficult situation.

7. References

1. Sacre H, Bird A, Clement-Jones M, Sharp A. Effectiveness of the fetal pillow to prevent adverse maternal and fetal outcomes at full dilatation cesarean section in routine practice. Acta Obstet Gynecol Scand. 2021;100(5):949-54.

2. Chooi KYL, Deussen AR, Louise J, Cash S, Dodd JM. Maternal and neonatal outcomes following the introduction of the Fetal Pillow at a tertiary maternity hospital: A retrospective cohort study. The Australian & New Zealand journal of obstetrics & gynaecology. 2023;63(3):360-4.

3. Safa H, Beckmann M. Comparison of maternal and neonatal outcomes from full-dilatation cesarean deliveries using the Fetal Pillow or hand-push method. Int J Gynaecol Obstet. 2016;135(3):281-4.

4. Hanley I, Sivanesan K, Veerasingham M, Vasudevan J. Comparison of outcomes at full-dilation cesarean section with and without the use of a fetal pillow device. Int J Gynaecol Obstet. 2020;150(2):228-33.

5. Retracted: Seal SL, Dey A, Barman SC, Kamilya G, Mukherji J, Onwude JL. Randomized controlled trial of elevation of the fetal head with a fetal pillow during cesarean delivery at full cervical dilatation. Int J Gynaecol Obstet. 2016;133(2):178-82.

6. National Health and Medical Research Council. NHMRC additional levels of evidence and grades for recommendations for developers of guidelines. Canberra 2009.

8. Links to College statements

Evidence-based Medicine, Obstetrics and Gynaecology (C-Gen 15)

Management of breech presentation (C-Obs 11)

Categorisation of urgency for caesarean section (C-Obs 14)

Caesarean birth at Maternal Request (C-Obs 39)

Responsibility for neonatal resuscitation at birth (C-Obs 32)

Management of Postpartum Haemorrhage (PPH) (C-Obs 43)

9. Consumer resources

RANZCOG patient information pamphlets can be viewed at: www.ranzcog.edu.au/pip

10. Links to relevant ATMs and learning modules

FRANZCOG Training Program Handbook. Basic Obstetric Skills Workshop (mandatory workshop). Available at: https://ranzcog.edu.au/wp-content/uploads/2022/05/FRANZCOG-Training-Program-Handbook_After-1st-December-2013.pdf

11. Legal and ethical implications

An analysis of the legal and ethical implications was not undertaken.

12. Recommendations for future research

A paucity of high quality evidence was identified for elevation of the fetal head with a fetal pillow during caesarean births at full cervical dilatation.

Appendices

Appendix A: Women's Health Committee Membership

Name	Position on Committee
Dr Scott White	Chair
Dr Gillian Gibson	Deputy Chair, Gynaecology
Dr Anna Clare	Deputy Chair, Obstetrics
Associate Professor Amanda Henry	Member and Councillor
Dr Samantha Scherman	Member and Councillor
Dr Marilla Druitt	Member and Councillor
Dr Frank O'Keeffe	Member and Councillor
Dr Kasia Siwicki	Member and Councillor
Dr Jessica Caudwell-Hall	Member and Councillor
Dr Sue Belgrave	Member and Councillor
Dr Marilyn Clarke	Aboriginal and Torres Strait Islander Representative
Professor Kirsten Black	SRHSIG Chair
Dr Nisha Khot	Member and SIMG Representative
Dr Judith Gardiner	Diplomate Representative
Dr Angela Brown	Midwifery Representative, Australia
Ms Adrienne Priday	Midwifery Representative, Aotearoa New Zealand
Ms Leigh Toomey	Community Representative
Dr Rania Abdou	Trainee Representative
Dr Philip Suisted	Māori Representative
Prof Caroline De Costa	Co-opted member (ANZJOG member)
Dr Steve Resnick	Co-opted member

RANZCOG wishes to acknowledge the significant contribution of Dr Scott White MFM in conducting the interim update of this statement to provide guidance for doctors who perform caesarean births in circumstances when the baby's head is deep in the mother's birth canal at the time of delivery, or when the baby is very large, or sometimes when the baby is in a breech presentation.

Appendix C: Overview of the development and review process for this statement

i. Declaration of interest process and management

Declaring interests is essential in order to prevent any potential conflict between the private interests of members, and their duties as part of RANZCOG Women's Health Committee or working groups.

A declaration of interest form specific to guidelines and statements (approved by the RANZCOG Board in September 2012). All members of the Statement Development Panels and Women's Health Committee were required to declare their relevant interests in writing on this form prior to participating in the review of this statement.

Members were required to update their information as soon as they become aware of any changes to their interests and there was also a standing agenda item at each meeting where declarations of interest were called for and recorded as part of the meeting minutes.

There were no significant real or perceived conflicts of interest that required management during the process of updating this statement.

ii. Steps in developing and updating this statement

This statement was developed in first published in July 2010 and reviewed in November 2013 and again in November 2019. The Women's Health Committee carried out the following steps in reviewing this statement:

- Declarations of interest were sought from all members prior to reviewing this statement.
- An interim review of review of meta-analyses and systematic reviews was undertaken in lieu of a full review of all published evidence.
- February 2023 – at the Women's Health Committee meeting, the existing recommendations tables were reviewed and updated (where appropriate) based on the available body of evidence and clinical expertise.
- November 2023 – the Women's Health Committee approved an interim update of this statement in response to retracted evidence that inflatable devices might reduce the risk of uterine injury.

RANZCOG statements are developed according to the standards of the Australian National Health and Medical Research Council (NHMRC), Levels of Evidence and Grades of Recommendations for Developers of Guidelines. Where no robust evidence was available but there was sufficient consensus within the Women's Health Committee, consensus-based recommendations were developed or existing ones updated and are identifiable as such. Consensus-based recommendations were agreed to by the entire committee. Good Practice Notes are highlighted throughout and provide practical guidance to facilitate implementation. These were also developed through consensus of the entire committee.

Recommendation category		Description
Evidence-based	A	Body of evidence can be trusted to guide practice
	B	Body of evidence can be trusted to guide practice in most situations
	C	Body of evidence provides some support for recommendation(s) but care should be taken in its application
	D	The body of evidence is weak and the recommendation must be applied with caution
Consensus-based		Recommendation based on clinical opinion and expertise as insufficient evidence available
Good Practice Note		Practical advice and information based on clinical opinion and expertise

Appendix D: Full Disclaimer

Purpose

This Statement has been developed to provide general advice to registered health practitioners regarding the consequences, delivery principles and considerations for delivery of a fetus at caesarean birth and should not be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of any person. It is the responsibility of each practitioner to have regard to the particular circumstances of each case. Clinical management should be responsive to the needs of the individual person and the particular circumstances of each case.

Quality of information

The information available in this statement is intended as a guide and provided for information purposes only. The information is based on the Australian/Aotearoa New Zealand context using the best available evidence and information at the time of preparation. While the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) has endeavoured to ensure that information is accurate and current at the time of preparation, it takes no responsibility for matters arising from changed circumstances or information or material that may have become subsequently available. The use of this information is entirely at your own risk and responsibility.

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These terms and conditions will be constructed according to and are governed by the laws of Victoria, Australia.

Version	Date of Version	Pages revised / Brief Explanation of Revision
v1.0	July / 2010	The statement was first published, approved by the RANZCOG Women's Health Committee/Board.
V2.0	November / 2013	Proposal to retire statement and develop an eLearning module rejected by RANZCOG Council. Update approved by RANZCOG Women's Health Committee/Board.
V3.0	November / 2019	Routine update of the statement approved by RANZCOG Women's Health Committee/Board.
V3.1	November / 2023	Interim update of the statement in response to retracted evidence.

Policy Version:	Version 3.1
Policy Owner:	Women's Health Committee
Policy Approved by:	RANZCOG Council/Board
Review of Policy:	November / 2024