



## **Vaginal or Cesarean Birth? A Systematic Review to Determine What is at Stake for Mothers and Babies**

Carol Sakala, PhD, MSPH  
Director of Programs, Childbirth Connection

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### **Background**

In recent years, cesarean rates in many countries have risen steadily. The National Center for Health Statistics released the provisional U.S. cesarean rate from 2004, a record-setting 29.1%. In 2006, an estimated one mother in three gives birth surgically.

Childbirth Connection is a national not-for-profit organization that uses research, education and advocacy to improve maternity care for all women and their families. Founded in 1918 as Maternity Center Association, Childbirth Connection has a long history of research, education and advocacy to improve maternity care quality. To promote evidence-based maternity care and help childbearing women and health professionals make informed decisions about how to give birth, Childbirth Connection carried out a systematic review (when known as Maternity Center Association or MCA), and has since used results for education, advocacy and media outreach.

This work was a priority for several reasons. A profound cultural shift in beliefs about giving birth is occurring, including new ideas such as:

"Vaginal birth is harmful."

"Having a cesarean will prevent later-life pelvic floor problems."

"Cesarean delivery, especially elective cesarean, is safe."

Dramatic practice change parallels shifts in belief. Cesarean rates in many countries have reached record highs. It is troubling that major changes in belief and practice have been occurring without benefit of a *systematic* look at the full range of harms favoring vaginal or cesarean birth. Conventional "narrative" reviews about this matter often appear to be making the case for or against more liberal use of cesarean section, reflecting their authors' values and philosophy. Childbirth Connection takes a different position, that women are best served by having access to lessons from best research evidence and safest, most effective care.

A November 2003 Committee Opinion from American College of Obstetricians and Gynecologists supported cesarean in the absence of medical indication, though clarity about lessons from the best research was unavailable. This statement contrasts with policies of other professional groups that do not support elective cesarean. These

groups include: International Federation of Gynecology and Obstetrics, International Confederation of Midwives, Society of Obstetricians and Gynecologists of Canada, and American College of Nurse-Midwives. In this context, professionals have been confused and divided, and cesarean rates have varied substantially across hospitals, individual caregivers, different types of caregivers, countries, etc. Media reporting on these issues has often been misleading, incomplete, and inaccurate, and women and the general public have been confused. Without access to carefully gathered and evaluated information, women's informed consent or informed refusal for this important decision was impossible.

### **Methods**

In response, Childbirth Connection/MCA carried out a systematic review to compare harms of vaginal and cesarean birth, developed a booklet (*What Every Pregnant Woman Needs to Know About Cesarean Section*) and web resources for women, and is carrying out education, advocacy and media outreach campaigns. The review documents describing methods and sources, key questions and outcomes, and reviewed studies (evidence tables) are available without charge as PDF files at: [www.childbirthconnection.org/article.asp?ck=10271&ClickedLink=200&area=2](http://www.childbirthconnection.org/article.asp?ck=10271&ClickedLink=200&area=2).

The review team developed a formal plan describing what the review would and would not do and include, and applied these criteria *without regard to conclusions of reviewed studies*. The core question was: what adverse outcomes differ in likelihood of occurrence between cesarean and vaginal birth? The review considered outcomes affecting both mother and child, shorter- and longer-term, as they impacted physical health, mental health and the mother-baby relationship. Surrogate outcomes were excluded, as their impact on lives of mothers and babies is unclear. The review considered two related questions that appear to be driving much change: causes of pelvic floor disorders and outcome of planned cesarean in comparison with both unplanned cesarean and vaginal birth.

To address resource constraints and the urgency of obtaining better quality information, the review team used a "best identified evidence" approach and limited reports that might be included in the review to: citations in a series of recent narrative reviews by respected leaders who had come to a range of conclusions on the issues (conclusions were ignored, but citations were pooled and systematically assessed, and those meeting criteria for inclusion were included and summarized in the review), two MEDLINE searches to complement narrative review citations with very recent publications, searches of two systematic review databases, and abstracts and articles in organizational files within the review scope. The team used the Oxford Centre for Evidence-Based Medicine research grading system (see [www.cebm.net/levels\\_of\\_evidence.asp](http://www.cebm.net/levels_of_evidence.asp)). Most studies included in the review were Level 2 or 3, systematic reviews of observational research or better individual observational studies.

MCA invited national non-profit organizations to comment on the plan and on review and booklet drafts, and to consider endorsing and publicizing the booklet. Obstetricians, family physicians, pediatricians, midwives, nurses, childbirth educators, doulas, researchers, advocates and others provided extensive input. Over 25 organizations endorsed the booklet, including American College of Nurse-Midwives, Lamaze International, National Association of Nurse-Practitioners in Women's Health, National Women's Health Network, and Society of Teachers of Family Medicine.

By applying core principles for systematic review and seeking the full range of harms that differ in likelihood by mode of birth, this work provides a new level of understanding about these pressing matters.

## **Results**

Over 300 research reports were evaluated for inclusion, summarized in evidence tables, and listed in the bibliography (see [www.childbirthconnection.org/article.asp?ck=10271&ClickedLink=200&area=21](http://www.childbirthconnection.org/article.asp?ck=10271&ClickedLink=200&area=21)). These studies described dozens of outcomes related to the key review questions.

The review identified many adverse effects that appear to differ in likelihood by mode of birth. Overall, results strongly favor vaginal birth. Harms that differed between vaginal and cesarean birth are listed below (see booklet appendix for estimates of absolute risk differences):

### Harms that Differed and Favored Vaginal Birth

#### **1. Shorter-term harms of cesarean to mothers**

- maternal mortality, related to surgery or anesthesia (as opposed to an underlying problem)
- emergency hysterectomy
- blood clots, stroke
- surgical injuries
- longer hospitalization
- rehospitalization
- infection
- severe and long-lasting pain

#### **2. Social and emotional harms of cesarean to mothers**

- poor birth experience
- less early contact with baby
- early unfavorable reaction to baby
- psychological trauma (both traumatic symptoms and positive screen for full Post-Traumatic Stress Disorder diagnosis: differences found only for women with unplanned cesarean)
- depression (measured in many studies, differed in about 1/2 of studies examined)
- poor overall mental health, self-esteem
- poor overall functioning

#### **3. Ongoing physical harms of cesarean to mothers**

- chronic pelvic pain
- bowel obstruction

#### **4. Harms of cesarean to babies** (in addition to possible impact of maternal impairment)

- accidental surgical cuts
- mild-to-severe respiratory problems
- not establishing breastfeeding
- childhood and adulthood asthma

## **5. Harms of cesarean for future reproductive capacity**

- infertility (involuntary)
- decreased fertility (voluntary)
- ectopic pregnancy/cesarean scar pregnancy
- placenta previa
- placenta accreta
- placental abruption
- uterine rupture
- maternal death

## **6. Harms of cesarean to babies in future pregnancies**

- stillbirth or neonatal death
- low birthweight, preterm birth
- malformation
- central nervous system injury

Outcomes in list #5 and #6 may involve hemorrhage, transfusion, emergency hysterectomy, and related events and procedures. A scarred uterus appears to provide a less hospitable environment than an unscarred uterus. Likelihood of harms for some of these outcomes increases exponentially as the number of previous cesareans increases. Because many women who do not plan additional births change their mind or continue with unplanned pregnancies, it is important to inform all women with the capacity to give birth in the future about these harms.

The review found that planned cesareans have advantages relative to unplanned cesareans with respect to short-term surgical injury and emotional toll. However, a planned cesarean is still major surgery, involving excess short-term risk relative to vaginal birth and potential for iatrogenic respiratory problems in babies. Planned and unplanned cesareans are likely to involve similar harms for conditions associated with scarring and adhesions (#3 above). All planned cesareans result in a scarred uterus, with a range of serious harms for future reproductive capacity that should be similar to cesareans overall or unplanned cesareans (#5 and #6 above).

### Harms that Differed and Favored Cesarean Birth

#### **1. Harm of vaginal birth to babies**

- brachial plexus injury, temporary in most instances

#### **2. Harms of vaginal birth to mothers**

- perineal/vaginal pain
- any urinary incontinence
- any bowel incontinence

It is impossible to interpret incontinence outcomes at present due to:

- measurement problems (use of surrogate measures, use of liberal definitions without reference to women's experiences, measurement during rather than following recovery period)
- confounding problems due to current vaginal birth management standards (studies have not distinguished effects of vaginal birth per se from those of common vaginal birth management practices with adverse effects such as episiotomy, forceful staff-

directed pushing, supine or lithotomy birth positions, and instrumental delivery; notably, many women giving birth experience multiple practices that may confer harm).

The review team *did not find a single study* that either attempted to compare cesarean delivery to safest vaginal birth practice or attempted to adjust for the use of undesirable vaginal birth management practices. Measurement problems noted above and effects of avoidable co-interventions must be sorted out to shed better light on these questions. It is thus inappropriate at present to conclude that “vaginal birth” per se causes pelvic floor dysfunction and to promote cesarean as a preventive measure.

Reviewed studies found that incontinence after usual care vaginal birth:

- is infrequent for most who experience it
- is minimal-to-mild in severity for most who experience it
- falls off sharply during the recovery period.

A year after usual care vaginal birth:

- about 3% of mothers have any new-onset urinary incontinence
- about 3% have any new-onset anal incontinence
- severe, troubling problems are rare
- severe urinary or bowel incontinence is associated primarily with forceps-episiotomy combination.

Several large studies consistently found that differences between cesarean and usual care vaginal birth groups in incontinence arising at birth diminish over time and disappear entirely by about age 50. High rates of later-life incontinence appear to be associated with other factors.

Non-maternity factors that have been associated with incontinence include excess weight, smoking, hormone therapy, hysterectomy, repeated urinary tract infections, some chronic diseases, some medications, impaired mobility and genetics. Many impact large numbers of women, and many are modifiable. It is important to ensure that women understand these risk factors and understand uncertainties relating to impact of mode of birth. Women should also understand that a proportion of women have incontinence prior to pregnancy, and a fair proportion develops incontinence during pregnancy.

### **Conclusion**

Without clear and well-supported justification for cesarean section or assisted vaginal birth, a spontaneous vaginal birth that minimizes use of interventions that may be injurious to mothers and babies is the safest way for women to give birth and babies to be born.

### **Implications for Practice**

Health professionals and childbearing women should understand and apply lessons from the best research.

Health professionals can find core documents from the systematic review at [www.childbirthconnection.org/article.asp?ck=10271&ClickedLink=200&area=2](http://www.childbirthconnection.org/article.asp?ck=10271&ClickedLink=200&area=2)

Childbirth Connection's online Evidence-Based Maternity Care Resource Directory includes several pages with resources for making change and improving practice, at [www.childbirthconnection.org/article.asp?ClickedLink=184&ck=10263&area=2](http://www.childbirthconnection.org/article.asp?ClickedLink=184&ck=10263&area=2)

To learn about programs that have successfully reversed rising cesarean rates, see "Current resources for evidence-based practice, March/April 2005," available at: [www.childbirthconnection.org/article.asp?ClickedLink=199&ck=10268&area=2](http://www.childbirthconnection.org/article.asp?ClickedLink=199&ck=10268&area=2)

Childbirth Connection has extensive online resources to help pregnant women understand these issues and make informed decisions. An inventory of these, with links, is available at: [www.childbirthconnection.org/article.asp?ck=10169&ClickedLink=547&area=27](http://www.childbirthconnection.org/article.asp?ck=10169&ClickedLink=547&area=27)

These resources include the consumer booklet *What Every Pregnant Woman Needs to Know About Cesarean Section*, as well as unique in-depth evidence-based web sections for learning, deciding and taking action:

- What should I know about cesarean section?
- Should I choose VBAC or repeat c-section?
- How can I prevent pelvic floor problems when giving birth?

The cesarean booklet includes many tips for avoiding unnecessary cesareans, assisted vaginal births and pelvic floor injuries. Most are supported by systematic reviews of randomized controlled trials (see references in methods/sources core document).

1. Tips (see booklet for details) for limiting all 3 areas:

#### In Pregnancy

- find midwife or doctor with low rates of intervention
- choose birth setting with low rates of intervention
- arrange for continuous labor support
- explore options for pain relief

#### In Labor

- work with caregivers to delay going to hospital
- receive good support throughout labor
- if possible, avoid continuous electronic fetal monitoring (EFM)
- avoid epidural analgesia

2. Additional tips for avoiding unnecessary cesareans:

#### In Pregnancy

- if cesarean is proposed, make informed decision
- if had previous cesarean, make informed decision
- if baby is breech, make informed decision, consider external version at term
- if fear of vaginal birth is great, consider in-depth counseling

### In labor

- avoid routine interventions when possible (in addition to EFM and epidural noted above, avoid induction, artificially rupturing membranes, arbitrary time limits)
- if cesarean is proposed, make informed decision

3. Additional tips for avoiding unnecessary assisted birth:

### In Labor

- push in upright or side-lying position
- avoid time limits for pushing
- push with Ferguson's reflex when possible

4. Additional tips for avoiding unnecessary pelvic floor injury:

### In Pregnancy

- talk with caregivers about limiting interventions that can increase harm
- perform pelvic floor muscle exercises (PFMEs)

### In Labor

- avoid routine use of interventions while pushing

### After Birth

- continue PFMEs

### Throughout Life

- maintain healthy body weight
- avoid smoking
- continue PFMEs
- minimize repeated urinary tract infections
- avoid hysterectomy, when possible
- avoid hormone therapy.