Repeat elective caesarean: decision-making for women with a previous caesarean section

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Abstract:
Context: Among women with a prior caesarean section, 82.2% will have another caesarean delivery. The Society of Obstetrics and Gynaecology of Canada (SOGC) recommends that physicians offer medically eligible women with a previous caesarean section a trial of labour, to attempt a vaginal delivery. With greater inclusion of the patient in medical decision-making, it is important to understand women’s part in this decision-making process.

Objectives: To describe women’s decision-making by looking at: 1) whether the decision was reported as primarily physician- or patient-driven 2) women’s reasons for repeat caesarean section, 3) women’s main information sources.

Methods: For one year women booked for a repeat elective caesarean section, who were eligible for a trial of labour according to the 2005 guidelines of the SOGC, were approached with the survey in hospital post-partum, and invited to participate in the study. Chart review was used to determine eligibility, and obtain other medical characteristics.

Results: Most of the women (77 %) reported being involved in the decision about their caesarean section. However, almost a quarter reported wholly physician-driven decisions (23 %). The main reasons women selected for a caesarean section related to their previous birth experience, and the physician’s recommendation. Women born outside of Canada, with less education or who were allophones, were less likely to report using certain information sources, such as the Internet, and to find the information in the hospital-provided pamphlet useful. All in all, the women who received less information were more likely to report solely physician-driven decisions.

Conclusion: Although patient involvement in decision-making is the norm, some decisions for caesarean section are made without the patient. Women’s concerns, such as fear of a failed vaginal delivery, play an important role in this decision-making. Overall, immigrant women may understand less about their birth options than their Canadian peers. Addressing these concerns during pre-natal counselling may aid more fully informed consent, help assuage women’s fears of vaginal birth and may increase the number of women attempting a trial of labour.
Résumé scientifique

Contexte : Parmi les femmes ayant déjà subi une césarienne, 82 % auront un autre accouchement par césarienne. La Société d’Obstétriques et Gynécologie du Canada (SOGC) conseille aux médecins d’offrir aux femmes éligibles l’option d’essayer un accouchement vaginal. Avec l’inclusion des patients dans les décisions médicales, il est important de comprendre le rôle des femmes dans ce processus de décision.

Objectif : Décrire le processus de décision en évaluant : 1) si la décision vient premièrement du médecin ou du patient, 2) les raisons données par les femmes pour le choix d’une césarienne, 3) les principales sources d’information utilisées par les femmes.

Méthodes : Au cours d’une année, les femmes enregistrées pour une césarienne, et éligible pour un accouchement vaginal selon le SOGC 2005, ont été approchées à l’hôpital postpartum et invitées à participer à l’étude. Le dossier médical a été utilisé pour déterminer l’éligibilité et d’autres caractéristiques médicales.

Résultats : La majorité des femmes (77%) ont participé à la décision concernant le choix d’une césarienne, mais à peu près un quart (23 %) ont rapportée que la décision a été faite entièrement par le médecin. Les femmes ont indiqué que des raisons reliées aux peurs d’un accouchement vaginal, et aux recommandations du médecin, ont supporté le choix d’une césarienne. Les femmes nées ailleurs, avec moins de scolarité, ou allophones ont moins utilisé certaines sources d’informations, telles que l’Internet, et ont trouvé l’information dans le dépliant de l’hôpital moins utile. En général, les femmes ayant reçu moins d’information ont été plus susceptibles de rapporter une décision faite seulement par leur médecin.

Conclusion : Bien qu’il y ait souvent la participation de la patiente dans le processus de décision, quelques décisions concernant le choix d’une césarienne sont faites sans la patiente. La peur d’un accouchement vaginal joue un rôle important dans la décision. Dans l’ensemble, les immigrantes pourraient moins bien comprendre leurs options d’accouchement que les femmes canadiennes. Considérer ces problèmes lors du suivi pré-natal pourrait aider au processus de
consentement, soulager les peurs reliées à un accouchement vaginal, et peut-être augmenter l’acceptante d’un essai d’accouchement vaginal.
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Preface and Contributions

This thesis is based on the project, “Vaginal Birth after Caesarean Section: Evaluating eligibility, offer rate and patient recall of consent for trial of labour”, developed by Dr Balbina Russillo, Marie-France Brizard, Jennifer Somera, Prof. Jeannie Haggerty and Steven Sanche.

Development of the questionnaire and consent forms was done jointly by Prof. Jeannie Haggerty, Dr Balbina Russillo and Frances Handley-Derry. Isabelle Boucher, and Christine Beaulieu provided assistance with the French translation of the questionnaire. The French translation of the consent form was done by Louise O’Neill. F Handley-Derry tested and refined the questionnaire, and Dr B Russillo and Prof. J Haggerty approved the final versions of the documents.

Participant recruitment was performed by Frances Handley-Derry, according to the protocol developed by Dr B Russillo et al. in the study “Vaginal Birth after Caesarean Section: Evaluating eligibility, offer rate and patient recall of consent for trial of labour”. Diane Bourget, Woodeline Dorlean, and Jennifer Somera assisted with recruitment when F Handley-Derry was unavailable.

The statistical analysis was performed by F Handley-Derry, under the guidance of Prof. J Haggerty and St Mary’s Statistician, Steven Sanche, excepting the sub-study power calculation, and margin of error calculations, which were performed by S Sanche.

The thesis paper was researched and written by F Handley-Derry, with editorial support from the Prof. J Haggerty and Dr B Russillo.
0.0 Family Medicine Context

Obstetrics is one of the specialties overlapping into family medicine (Spitzer, 1977). One of the unique aspects of family medicine is the opportunity to develop a deeper understanding about patient’s lives, values, spiritual beliefs and relationships, as well as their medical history (Spitzer, 1977). For pregnant women, the decision about mode of delivery has many dimensions. A woman’s personal experience and values will have an impact on which option she prefers. This project was inspired by family medicine in the recognition of the importance of examining the patient’s view, as well as their medical history.

A better understanding of why women underwent a repeat caesarean section instead of attempting a vaginal birth will allow health care providers, including family physicians, to tailor the counselling processes to best address individual women’s needs and concerns. This will help improve quality of care, and inform family medicine’s best practice.

This thesis is part of study entitled “Vaginal Birth after Cesarean Section: Evaluating eligibility, offer rate and patient recall of consent for trial of labour”, which was conducted at St Mary’s Hospital Center in Montreal, Quebec.

1.0 Introduction

Caesarean section is one of the most commonly performed surgical procedures in Canada. In 1969, the rate of caesarean section in Canada was approximately 5% (Kirkey, 2009) and in 2011, 28.8% of all births were done by caesarean ("Health Indicators 2012," 2012).

There is concern over the increasing number of caesarean sections performed as this procedure is associated with a higher risk placenta previa and placenta accreta in future pregnancies, increased risk of respiratory problems in the newborn, as well as the risks of the surgery itself, which include injury to the bowel and the bladder, and complication from the anaesthesia (Dickerson, 2010). There are many factors that are driving this increase in caesarean rate, but one potentially modifiable factor is the number of repeat caesarean sections. To reduce
the number of repeat caesareans sections performed, the number of women delivering vaginally after a prior caesarean section must be increased.

Based on the demonstrated safety of vaginal birth after caesarean section (VBAC), the Society of Obstetrics and Gynecology of Canada (SOGC) recommends that “provided there are no contraindications, a woman with one previous transverse low segment caesarean section should be offered a trial of labour with appropriate discussion of maternal and perinatal risks and benefits”(SOGC, 2005). Despite this guideline, in 2011 82.2% of women who had a primary caesarean section had a repeat procedure (CIHI, 2012).

Following the SOGC guidelines, clinicians, including obstetricians and family doctors, must counsel their patients who have had a previous caesarean section with regards to the best mode of delivery of their next child (caesarean section or trial of vaginal birth). Therefore, a proportion of repeat caesarean sections are discretionary to the decision-making process.

Current medical practice has swung towards greater inclusion of the patient in their medical decision-making, particularly in situations where patients may have strong preferences or priorities, such as childbirth (Little et al., 2008). Consequently, it is important to consider the influences that a woman brings to the decision-making process, and how these impact the rate of repeat caesarean section.

This project aims to provide useful and new knowledge to the fields of family medicine and obstetrics by approaching decision-making for women with a previous caesarean section from an unexplored perspective- combining an estimation of whether the decision for caesarean section was primarily patient or physician driven with an exploration of women’s reported reasons for having a repeat caesarean section and their underlying sources of information. This may help physicians to be more aware of the perspectives women bring to the decision-making process during the pre-natal visits, and may improve the full counselling process.
2.0 Literature Review

2.1 Purpose

The purpose of the literature review was to identify articles on the following topics: 1) the safety of repeat elective caesarean section, and trial of labour/VBAC, and 2) decision-making and/or preference for VBAC or repeat elective caesarean section, from the patient and provider perspectives.

2.2 Search Strategy

The articles used in the following literature review were identified through searches performed on the databases Pub MED and Web of Science, as shown below in Figure 1:

**Figure 1: Search Strategy**

On Web of Science, two separate searches were performed:

1. “caesarean section” AND “decision-making”
2. “repeat caesarean section” AND “decision-making”.

On Pub MED, four searches were performed:

1. “vbac and repeat elective caesarean and benefits and risks”

In order to determine whether the article was suitable for inclusion, both the title and the abstract were reviewed, and if they did not relate to one or more of the determined topics, the article was excluded. Other exclusion criteria included studies published in languages other than English or French, and studies published before 1975.
After removing duplicates, and reviewing citations from the articles for relevant work on related topics, there were a total of 82 articles. Studies using qualitative methodologies were included in the literature review as they provided the most in depth information on decision-making and birth preferences, whereas quantitative investigations provided information on safety and factors affecting the rates of repeat elective caesarean section /VBAC. There were no randomized control trials performed in the field. Therefore, the best available evidence came only from observational studies.

Apart from journal articles, the most recent clinical guidelines from the Society of Obstetrics and Gynaecology of Canada, the American Congress of Obstetrics and Gynaecology, and the National Institute for Clinical Excellence, trends in birth from the Canadian Institute of Health Information and Public Health Agency of Canada, and current opinion pieces from Canadian newspapers, and public sites were also reviewed.

2.3 Caesarean Section

A caesarean section is defined as the delivery of the foetus through surgical removal from the mother’s uterus (Dresang & Leeman, 2012). When caesarean sections were first performed, it was in situations of high maternal distress or in cases of maternal death to try to save the foetus (Dresang & Leeman, 2012). When Dr Edwin Cragin used the caesarean technique in the early 1900s, it was on women who nearly died during their pregnancies. He recognized that these women would have little chance of delivering vaginally in future pregnancies, thereby coining the phrase “once a caesarean, always a caesarean (Dickerson, 2010). This continued to be the main mode of care for many years.

Caesarean sections, in many situations, are necessary to prevent harm to the foetus and/or the mother. However, there are complications with a high caesarean rate. There are the risks of major abdominal surgery, transient tachypnea in the newborn, delay of maternal-foetal bonding, and increased rates of placental abnormalities (Dickerson, 2010). Once a woman has had one
caesarean section, she is at a higher risk for complications in future pregnancies, such as blood transfusion, admission to the intensive care unit, and hospital readmission (Galyean, Lagrew, Bush, & Kurtzman, 2009). The current caesarean section rate in Canada is 28.8% ("Health Indicators 2012," 2012). It has been estimated that if the caesarean delivery rate increased to 50%, this would result in an additional 6236 placenta previas, 4504 placenta accretas, and 130 maternal deaths per year as compared to those deliveries being vaginal deliveries (Solheim et al., 2011). These risks must also be considered when forming practice guidelines for vaginal and caesarean birth.

2.4 Vaginal Birth after Caesarean Section

VBAC is defined as ‘a successful vaginal birth after a woman has had a previous caesarean section’. A classical (vertical) caesarean incision makes future labour more dangerous, mainly due to the increased risk of uterine rupture, which occurs in 4000-9000 of 100,000 trials (4-9 %) (Dickerson, 2010). Uterine rupture may have devastating consequences for the foetus, causing death or brain damage due to anoxia, and for the reproductive future of the mother, if a hysterectomy is required. New surgical techniques, such as using a low transverse incision and a double-layer closure of the uterus, have decreased the risk of uterine rupture during subsequent labour. With a low transverse caesarean section, the risk of uterine rupture during a trial of labour is 778 per 100,000 (less than 1%) ("National Institutes of Health Consensus Development conference statement: vaginal birth after cesarean: new insights March 8-10, 2010," 2010).

The main concerns about VBAC are the risk of uterine rupture or dehiscence, which may result in perinatal death and/or maternal complications. However, these risks may be balanced by the reduction of maternal morbidity for minor complications (McMahon, Luther, Bowes, & Olshan, 1996), and a decreased risk of hysterectomy (Rossi & D'Addario, 2008). VBAC is considered a preferred strategy for women who would like to have two or more pregnancies.
after a first caesarean delivery due the decreased chance of future placental abnormalities (Pare, Quinones, & Macones, 2006).

The 2010 National Institute of Health Conference on VBAC summarized high-grade evidence on maternal mortality for women attempting a VBAC versus a repeat caesarean section, and found the overall risk was lower with a successful VBAC (3.8 vs. 13.4 of 100,000) ("National Institutes of Health Consensus Development conference statement: vaginal birth after cesarean: new insights March 8-10, 2010," 2010).

VBAC gained in popularity in the 1980’s and 1990’s, with many studies showing its safety. In 1995, the rate of VBAC in Canada was 35.3 %, but by 2011 it had decreased to 17.8% (CIHI, 2012; PHAC, 2008). This decline has been attributed to several factors, including obstetrical guidelines requiring the immediately availability (within 30 minutes) of an emergency caesarean section should there be non-reassuring signs during a trial of vaginal birth. Many smaller hospitals, especially in the United States of America, refuse women the option of attempting a vaginal birth because they cannot meet this guideline (Korst, Gregory, Fridman, & Phelan, 2011).

2.5 Trial of Labour

A trial of labour is defined as ‘the attempt to deliver vaginally after having had a previous caesarean section’. A successful trial of labour ends in a vaginal birth, and a failed trial of labour will require an emergency caesarean section. It is estimated that a trial of labour ends in a successful vaginal birth in 60 to 80% of all trials (Grobman, 2010). This number varies according to a variety of medical factors. Factors associated with a greater chance of success include: a previous vaginal delivery, spontaneous labour (as opposed to induced labour), a favourable cervix, or if the primary caesarean was performed for reasons of breech presentation, placenta previa or pre-term birth (Caughey, 2006). Factors associated with a decreased chance of success are: maternal obesity (Carroll, Magann, Chauhan, Klauser, & Morrison, 2003; Homer, Kurinczuk, Spark,
Brocklehurst, & Knight, 2011), short stature, and cephalopelvic disproportion (Edozien, 2007). Some studies have also found a lower chance of a successful vaginal birth in women with chronic hypertension, diabetes or renal disease, as well as with greater maternal age, greater weight gain during pregnancy (Grobman, 2010), greater birth weight of the baby (Jastrow et al., 2010) and non-European descent (Hollard et al., 2006).

Ideally, identifying those women who would be most likely to have a successful trial of labour would help reduce the chances of adverse outcomes during labour, because a failed trial of labour is associated with greater foetal and maternal morbidity and mortality than either a successful VBAC or a repeat caesarean section (Cheng et al., 2011; Go, Emeis, Guise, & Schelonka, 2011; Mona T. Lydon-Rochelle, Cahill, & Spong, 2010; Patel & Jain, 2010). Many researchers have tried to find a robust prediction model for a successful trial of labour in order to help guide the decision towards the option most likely to succeed. Currently, the VBAC Calculator (Costantine et al., 2009) is in use in some clinical situations. This model predicts the probability of a successful VBAC using a regression analysis model with the variables: maternal age, pre-pregnancy body mass index, ethnicity, prior vaginal delivery or VBAC, and indication for prior caesarean delivery. The VBAC Calculator has recently been validated in the Quebec population, reaffirming the accuracy of the model and showing that for women with a higher predicted success rate, approximately 70 %, the risk of complications was similar to that of a planned repeat caesarean section (Chaillet, Bujold, Dube, & Grobman, 2013). There are still many uncontrollable factors affecting labour, which cannot be taken into account beforehand (Grobman, 2010). However, it is hoped that using such a model will help to reduce adverse outcomes, and improve decision-making, and maternal satisfaction (Costantine et al., 2009).
2.6 The Safety of Repeat Caesarean versus Vaginal Birth after Caesarean

It is considered unethical to run a randomized control trial to directly compare the safety of VBAC with that of repeat caesarean section (Clare L. Emmett et al., 2007). Therefore, observational studies are the only available method of comparison. Comparing repeat caesarean sections and VBAC is also difficult because the main outcomes of interest (maternal/foetal mortalities and severe morbidities) are very rare, and large numbers are needed to record even a few events.

Several important observational studies, undertaken to compare the safety of the two modes of delivery, will be discussed in the following paragraphs. These studies compared the choices of repeat caesarean section to trial of labour, rather than VBAC directly, in consideration of the fact that women selecting a trial of labour may have end up having a vaginal birth or an emergency caesarean section. An emergency caesarean section and a successful vaginal birth are unequal outcomes, as the former is associated with the greatest risk to both the mother and the foetus, and the latter with the least risk to both parties (McMahon et al., 1996).

McMahon et al conducted a retrospective, population-based, longitudinal study in Nova Scotia (McMahon et al., 1996). Between the years 1986 to 1992, the outcomes of 3249 women, who had selected a trial of labour, were compared to those of 2889 women who had selected a repeat caesarean section. There were no maternal deaths during the study, and the overall maternal morbidity rate was 8.1% (McMahon et al., 1996). Of the women who had a trial of labour, 60.4% had a successful vaginal delivery. Women undergoing trial of labour were twice as likely as the women having a repeat caesarean section to have a major complication (hysterectomy, uterine rupture, operative injury), but were 20% less likely to have a minor complication (puerperal fever, blood transfusion or abdominal wound infection) (McMahon et al., 1996). Within the major complications seen in the trial of labour group, 92.5% of these were in those women who were not able to deliver vaginally, and who had emergency caesarean sections (McMahon et al., 1996).
Considering the safety of the foetus, Smith et al compared perinatal mortality (unrelated to congenital abnormality) in uncomplicated term pregnancies for a) women undergoing a trial of labour, b) women planning a repeat caesarean delivery, and c) nulliparous and multiparous women delivering vaginally (Smith, Pell, Cameron, & Dobbie, 2002). This was a retrospective cohort study that used data from the Scottish Morbidity Record and Stillbirth and Neonatal Death Enquiry; a national database recording birth information from January 1 1992 till December 31 1997. The main outcome of interest was delivery-related perinatal death, which was compared between the following groups of women: i) 15,515 women attempting a trial of labour, ii) 9,014 women planning a repeat caesarean section, iii) 137,160 nulliparous women and 151,549 multiparous women with no history of caesarean who were planning natural births (Smith et al., 2002). Exclusion criteria for the study were: multiple pregnancy, non-cephalic presentation, delivery not between 37-41 weeks, perinatal death due to congenital abnormality, and planned primary caesarean sections (Smith et al., 2002). Among women undergoing a trial of labour, the rate of perinatal death was 12.9 out of 10,000. This was similar to nulliparous women in labour (Odds Ratio (OR): 1.3; 95% Confidence Interval (CI), 0.8-2.1), but twice as high as multiparous women in labour (OR: 2.2; 95% CI, 1.3-3.5) and 11 times greater than the women having a planned caesarean delivery OR: 11.6; 95% CI, 1.6-86.7) (Smith et al., 2002). Perinatal mortality was most frequently associated with mechanical causes or intra-partum anoxia due to uterine rupture. Overall, though the absolute number of infant deaths was small, repeat caesarean section had significantly fewer deaths due to uterine rupture.

Landon et al, who conducted a retrospective cohort study of women undergoing either a trial of labour or a repeat caesarean section, corroborated the above results for perinatal mortality (Landon et al., 2004). There was a slight increase in perinatal mortality in women undergoing a trial of labour, as compared to women undergoing a repeat elective caesarean section, though again the absolute numbers were small (Landon et al., 2004). There was also no significant difference in maternal mortality between trial of labour and repeat caesarean
section. The greatest maternal morbidity was among women with a failed trial of labour (OR: 6.81; 95% CI, 5.93-7.83) (Landon et al., 2004).

Most recently, in 2012, a prospective cohort study by Crowther et al. of 2345 women with one prior caesarean section, eligible for a trial of labour at term, also showed a slightly lower relative risk of perinatal mortality associated with repeat caesarean section (RR; 0.39; 95% CI 0.19- 0.80) (Crowther, Dodd, Hiller, Haslam, & Robinson, 2012).

Overall, these studies have shown that: i) repeat caesarean section is associated with decreased risk of perinatal death (Smith et al., 2002) and increased risk of maternal morbidity (Crowther et al., 2012; Landon et al., 2004), ii) a failed trial of labour is associated with the greatest risk of maternal morbidity (McMahon et al., 1996), and iii) a successful VBAC is associated with the least maternal morbidity (McMahon et al., 1996), and the quickest recovery (Villar et al., 2007).

Though a caesarean section has been associated with lower incidences of perinatal death, there are secondary consequences to the infant that must be considered; chiefly an increased risk of pulmonary problems, including transient tachypnea of the newborn, and the impact on the mother-infant bonding as the mother recovers from her surgery in the immediate post-natal period (Biswas, 2003). In sum, there are risks, and benefits to be balanced for both options.

2.7 Society of Obstetrics and Gynaecology of Canada Guidelines

The guidelines of the Society of Obstetrics and Gynaecology of Canada (SOGC) state that “provided there are no contraindications, a woman with one previous transverse low segment caesarean section should be offered a trial of labour with appropriate discussion of maternal and perinatal risks and benefits” (SOGC, 2005). The absolute contra-indications in this guideline are: previous history of a classical or inverted-T incision, history of myomectomy entering the uterine cavity, placenta previa, breech presentation, and an active genital herpes infection. Having two or more previous caesarean sections is a relative contra-
indication (SOGC, 2005). According to the SOGC guidelines, women who are eligible for a trial of labour should undergo a decision-making process with their physician: “after thorough counselling that weighs the individual benefits and risks of VBAC, the ultimate decision to attempt this procedure or undergo a repeat caesarean delivery should be made by the patient and her physician” (SOGC, 2005).

2.8 Sources of Information about Birth Options

The National Institute of Health and Clinical Excellence recommends that “pregnant women be offered information based on current available evidence together with support to enable them to make informed decision about their care” (NICE, 2004). However, there is no standardized way to present women with the information about the risks and benefits of their birth options (Watkins & Weeks, 2009). Women get information about their health care from a wide variety of sources: health care professionals, friends and family, hospital pamphlets, and the Internet (Chen & Hancock, 2012; Watkins & Weeks, 2009). Aside from this, they also rely heavily on personal experience and perceived benefits (Watkins & Weeks, 2009). While some women may prefer to leave the decision to their health care provider, others may prefer to be highly involved in the decision (C. L. Emmett, Shaw, Montgomery, Murphy, & Di, 2006). Overall, a systematic review found that involvement in decision-making was correlated with higher satisfaction with the childbirth experience, suggesting that physicians should encourage patient involvement (Hodnett, 2002).

Renner et al analysed the information received by 80 women with a previous caesarean section, who delivered by VBAC or repeat caesarean section at a US teaching hospital, using a retrospective questionnaire. There were some differences in the topics discussed with the women, most notably the risk of uterine rupture, which was more likely to be discussed with women who chose a trial of labour (Renner, Eden, Osterweil, Chan, & Guise, 2007). Interestingly, women who chose a trial of labour reported feeling more involved in the decision-
making than women who chose a caesarean section (Renner et al., 2007). The study reported no significant association between chosen route of delivery and the main source of information. However, the main sources of information for the women were not provided, as the analysis was done by topic discussion (uterine rupture, recovery time etc.) (Renner et al., 2007).

An Australian study also surveyed women’s knowledge about the risks and benefits of repeat caesarean section and VBAC. In particular, there was a lack of knowledge about risks of repeat caesarean section. It was suggested that this knowledge deficiency could have affected why the majority of the women chose a caesarean section. However, the generalizability of the study is limited, given its small sample size (33 participants) (Chen & Hancock, 2012).

2.9 Numeracy and Decision-making

The current evidence for the risks and benefits of VBAC and repeat caesarean section is usually presented in terms of percentages and ratios. Interpreting this statistical information may be difficult for people with weak numeracy skills. When interpreting statistical information, people are subject to two major biases: self-positivity (underestimating one’s own risk as compared to others) and self-negativity (overestimating one’s own risk as compared to others) (Yan & Sengupta, 2013). These biases can both be present together in the same decision-making process, depending on how different statistical information is presented.

Several sub-groups of the population tend to have lower numeracy skills than the general population. These include people who are non-native speakers of the language in use, and people who have not completed high school (Reyna, Nelson, Han, & Dieckmann, 2009). Even for people with stronger numeracy skills, interpretation of the same information may be different between physicians and patients, because of their prior knowledge and experience (Kaimal & Kuppermann, 2010). The patient’s previous experience plays an important role in their decision-making about health care- a factor that can often be overlooked. In
general, people are drawn to stories, about themselves and others, which they use to make the medical information more comprehensible and salient to themselves (Ziebland & Herxheimer, 2008).

Sharma et al compared the outcomes of two models, one based on subjective risk and the second based on objective risk, in generating birth recommendations for women with a previous caesarean section (Sharma, Eden, Guise, Jimison, & Dolan, 2011). The first model (subjective) used maternal priorities to assign mode of delivery, and the second model (objective) used maternal priorities in combination with absolute risk values. They found that the first model favoured repeat elective caesarean due to the mother’s preference to avoid any risk to the foetus, and the second model favoured choosing a trial of labour because of the low risk to the mother, and its high probability of success (Sharma et al., 2011). Overall, this shows the importance of relative value judgements, and the interpretation of statistical information, in the decision-making process about mode of delivery.

### 2.10 Decision-aids

Several research teams have created decision-aids for women with a previous caesarean section to help them select between the two birth options, based on their priorities or preferences (Dugas et al., 2012; Clare L. Emmett et al., 2007; Farnworth, Robson, Thomson, Watson, & Murtagh, 2008; Frost, Shaw, Montgomery, & Murphy, 2009; Shorten, Shorten, Keogh, West, & Morris, 2005). The decision-aids tested in these studies included computer-based information and decision analysis programs (Clare L. Emmett et al., 2007), informational DVDs, home visits (Farnworth et al., 2008), and decision-aid booklets (Shorten et al., 2005). Generally, these studies found that the decision-aids increased the general knowledge of participants, and helped reduce decisional conflict for the women (Farnworth et al., 2008; Frost et al., 2009; Shorten et al., 2005). However, a meta-analysis of studies on decision-aids revealed no differences between the actual mode of deliveries (VBAC versus repeat caesarean section) between decision
groups and control groups, suggesting that using decision-aids would not impact birth trends (Dugas et al., 2012).

The main shortcomings of the decision-aids, such as computer-based decision-analysis or informational programs, were identified as a lack of personalized information, and a tendency to create greater anxiety about the birth (Frost et al., 2009). Despite some women feeling anxious about the risks presented, other women found the information useful because it helped them to prepare for what to expect during their birth experience, rather than having a negative outcome take them by surprise (Frost et al., 2009).

Many women had a preference about the mode of delivery prior to using one of the decision-aids, but their actual mode of delivery did not often correspond with these earlier preferences (Dugas et al., 2012; Shorten et al., 2005). A positive aspect of having a decision-aid that presents both options to the women is that they are then better prepared for having either a vaginal birth or a caesarean section, which may be dictated by circumstance rather than choice.

2.11 Role of the Physician in Decision-making

In 1989, Norman et al conducted a retrospective chart review of a birth cohort of women delivering at the Toronto General Hospital (Norman, Kostovcik, & Lanning, 1993). Of the women with one prior caesarean section, only 30% of them attempted a vaginal birth, whereas 71% were eligible for a trial of labour according to the obstetrical guidelines at that time (Norman et al., 1993). When looking more closely at the women having a repeat caesarean section, the authors noted that only 11% of the women had a discussion of trial of labour noted in their charts. This suggested to them that part of the reason for a low VBAC rate at their hospital might have been the lack of an offer or discussion of a trial of labour on the part of the physician. Supporting this hypothesis was the fact that of the women who had a discussion of VBAC, 79% did choose to attempt a vaginal birth (Norman et al., 1993).
A survey of obstetrical practice in Australia and New Zealand showed that 96% of physician respondents supported or strongly supported presenting the option of a trial of labour to women (Dodd & Crowther, 2003). However, there are no clear guidelines for how this process should actually take place within the prenatal counselling. How to approach decision-making for a trial of labour or repeat caesarean section is considered by some to be a contentious area of obstetrical practice. Three of the potential ethical issues surrounding this process are: 1) concerns about the overall caesarean delivery rate, 2) concerns about maternal and foetal safety and 3) concerns about patient autonomy (Lyerly & Little, 2010). With regards to decision-making, obstetricians have stated that they viewed the decision-making process as needing to be flexible to accommodate each individual situation (Kamal et al., 2005). Physicians take into account not only their own professional experience, but also their relationship with the patient, and other external pressures and concerns that might arise (Kamal et al., 2005). Strict protocols regarding what and what not to discuss, were considered too limiting in this area, due to a lack of high quality evidence, perhaps relating to the absence of evidence based on randomised controlled studies.

Kamal et al investigated the factors influencing repeat caesarean section from the perspective of obstetricians and midwives, using an exploratory qualitative study. Many of the professionals interviewed indicated that they felt VBAC was the preferred option, due to the low risk to mother and child, and the faster maternal recovery time (Kamal et al., 2005). Despite this view, they also noted that there is now a “low threshold” for performing caesarean sections; meaning that physicians are more likely to perform a caesarean section in situations where they would not have 20 or 30 years ago. For example, foetuses in breech presentation used to be delivered vaginally (Kamal et al., 2005). Now, fewer physicians have experience performing a breech delivery, and it is more often managed by caesarean section (Deline et al., 2012).

Who is providing the consultation, and overseeing the birth, may also have an impact on whether or not the woman has a caesarean section. The Santa Fe Indian Hospital saw increased odds (OR: 2.4, p= 0.02) of a woman having a
caesarean section if an obstetrician, as opposed to a nurse or midwife, attended her birth (Mahoney & Malcoe, 2005). In 2012, Harris et al showed that a multidisciplinary maternity care model reduced the chance of a woman undergoing a caesarean delivery (RR: 0.76, 95% CI 0.68-0.84), and increased the likelihood of a woman choosing to attempt a VBAC (RR: 3.22, 95% CI 2.25-4.62), compared to women receiving standard care (Harris et al., 2012). This may be mediated in part by how the discussion about the risks of trial of labour, including risk of uterine rupture is phrased by the counselling health professional ("National Institutes of Health Consensus Development conference statement: vaginal birth after cesarean: new insights March 8-10, 2010," 2010).

Currently in the United States, the most common indications for repeat caesarean sections without labour are “elective” (36%) and “maternal request” (18%) (M. T. Lydon-Rochelle, Gardella, Cardenas, & Easterling, 2006). These indications have no medical definition, and are very difficult to classify, as they do not reflect the counselling process between the patient and the physician.

2.12 Role of the Woman in Decision-making

In several studies examining decision-making about mode of delivery for women with a prior caesarean delivery, a common theme was that although women supported the notion of ‘choice’, most felt that no matter their personal preference, their delivery would actually be determined by the circumstances of their pregnancy (position of the baby, progression of labour etc.) (Kingdon et al., 2009; Moffat et al., 2007). In many cases, the women viewed their personal preference as secondary to whatever intervention would be necessary to ensure the best outcome for their baby (Kingdon et al., 2009). Some women also noted feeling uncomfortable if the final choice between trying for a vaginal birth and a repeat caesarean section was left entirely to them, as they trusted their caregivers as knowledgeable experts, better able to weigh the risks and benefits of both options, with respect to their medical history (C. L. Emmett et al., 2006; Kingdon et al., 2009; Moffat et al., 2007).
While some women have an idea of their preferred mode of delivery early in the pregnancy, other women are unsure or change their minds as they acquire more information or their circumstances change (Clare L. Emmett, Montgomery, Murphy, & On behalf of the Di, 2011; Moffat et al., 2007). Patient knowledge acquisition is therefore a dynamic process, evolving throughout the pregnancy (Kingdon et al., 2009; Moffat et al., 2007). In terms of information received during the pregnancy, women felt that not a lot of the information was provided up front, but rather that it had to be actively sought (C. L. Emmett et al., 2006). The process of decision-making for women in this situation is a complex blend of wanting to have input, but not necessarily wanting full responsibility for the choice. Women planning a second caesarean section talked about the doctor’s recommendation, the views of friends and family, and their own personal reflections as all being important in the decision-making process (Fenwick, Gamble, & Hauck, 2006).

### 2.12.1 Women’s reasons for caesarean section

What has been seen often in the media is an emphasis on maternal requests for caesarean section being a major contributing factor to the increase in caesarean rate, though there is little scientific evidence to support this claim (McCourt et al., 2007). To understand why a woman would want a repeat cesarean section, it is important to look at their values and priorities for childbirth. For example, many women prioritize the health and safety of the child above their own. The main reported reasons for preferring a caesarean section are: i) belief that it will provide greater safety for the baby, ii) a recommendation from a doctor, iii) a previous negative birth experience, iv) fear of labour/pain/failure of labour, v) desire for sterilization, and vi) convenience (Eden, Hashima, Osterweil, Nygren, & Guise, 2004; C. L. Emmett et al., 2006; Fraser, Maunsell, Hodnett, & Moutquin, 1997; Fuglenes, Aas, Botten, Oian, & Kristiansen, 2011; McCourt et al., 2007; Murphy & Harvey, 1989). Overall, fear of labour, and previous negative birth experiences were the greatest predictors of preference for a caesarean section among multiparous woman (Fuglenes et al., 2011; Watkins & Weeks, 2009).
Fear of labour may come from a personal negative birth experience, but may also come from other women’s experiences in a broader social context. Negative vaginal birth stories from friends and family have played a role in women requesting a caesarean section, with and without concurrent medical reasons (Munro, Kornelsen, & Hutton, 2009). To these women, caesarean birth is perceived positively, as being quick, convenient, and a likely outcome of labour anyway. Taking this line of reasoning, the main conclusion would seem to be why not avoid labour and just get to the caesarean (Munro et al., 2009)?

After having had an emergency caesarean section, women reported more dissatisfaction and disappointment with the birth experience than either women who had a planned caesarean or women who had a vaginal birth (Blomquist, Quiroz, Macmillan, McCullough, & Handa, 2011). Following such an experience, many women change their expectations of childbirth. This previous birth becomes associated with fear and anxiety, leading women to be more likely to consider a repeat caesarean section for the next delivery rather than go through the uncertainty of labour a second time (Fenwick et al., 2006). A caesarean section may seem like a more reasonable option as women change their discourse to focus on the unpredictable nature of birth, and the possibility of caesarean section (Fenwick et al., 2006). Already knowing the process and recovery time for a caesarean section, women then felt more confident about planning a repeat caesarean section rather than in facing the uncertainty of a trial of labour (McGrath & Ray-Barruel, 2009).

2.13 Summary

Repeat caesarean sections contribute to the overall caesarean section rate in Canada. However, this number is potentially modifiable through the decision-making process involving physicians and patients with a previous caesarean section who are eligible for a trial of labour. From the current body of evidence, a successful VBAC is associated with lowest risk for the mother, and repeat caesarean section with lowest risk for the foetus (Korst et al., 2011).
Despite guidelines from the SOGC supporting discussion of a trial of labour with eligible women, the rate of repeat caesarean section in Canada is increasing (CIHI, 2012). The role of the physician in this decision-making process is to present information about their birth options to the patient, weighted by their own professional experience (Kamal et al., 2005). Women have varying degrees of involvement (C. L. Emmett et al., 2006; Kingdon et al., 2009; Moffat et al., 2007), depending on their priorities for the upcoming birth and previous experiences (Eden et al., 2004; Fuglenes et al., 2011; Watkins & Weeks, 2009). Along with their general background, those concerns may colour their interpretation of the information provided by their physician, and the other information they seek out (Reyna et al., 2009; Sharma et al., 2011). Decision aids are one way to help women participate more in the decision-making process, though they may not alter overall delivery rates (Dugas et al., 2012).

2.14 Conclusion

In terms of the rate of repeat caesarean section, the patient’s perspective becomes very important as women take greater autonomy in selecting their mode of delivery. Specifically, this thesis will examine: 1) whether the decision to have a second caesarean section was reported as primarily physician or patient-driven, 2) women’s reasons for a second caesarean section, 3) women’s main sources of information. These aspects together will provide a previously unexplored overview of different parts of the decision-making process, and further our understanding of why women, who were eligible for a trial of labour, had a repeat caesarean section.
3.0 Methods

3.1 Objectives and Study Design

This thesis will investigate the decision-making of women eligible for a trial of labour, booked for a repeat caesarean section. The specific objectives are to: 1) Estimate whether the decision was primarily physician-driven or patient-driven, 2) Identify the most common reasons reported as influencing the decision, 3) Identify the most common sources of information used in the decision.

To address these objectives, this project uses quantitative methodology, specifically, a patient survey with concurrent chart review of a consecutive sample of women giving birth by caesarean section at St Mary’s Hospital Center, Montreal over a one-year period (2012-2013).

3.2 Study Population

The study population was women eligible for a trial of labour, booked for a repeat caesarean section at a community teaching hospital in Montreal, Canada, from January 23 2012 to January 23 2013. Inclusion criterion for the survey was maternal age over 18 years. The target population for the results of this study will be pregnant women, who have had one previous caesarean section and are considering the delivery method for their upcoming child. It was chosen to sample from the women while they were in hospital after their delivery for reasons of feasibility, and because it was assumed that these women would have undergone a similar decision-making process to the target population.

3.3 Sampling and Recruitment

The sample is all participants recruited from January 23 2012 to January 23 2013. The procedure for participant recruitment is outlined below in Figure 2:
The daily elective caesarean list was used as the sampling frame for the project, and to separate the women into primary and repeat caesarean sections. All the primary caesarean sections were excluded from the study. Among the repeat caesarean sections, the women were separated into those eligible and ineligible for a trial of labour using a chart review. The absolute contra-indications for a trial of labour were based on the 2005 guidelines from the SOGC as follow: history of inverted T or classical section, breech presentation, myomectomy, placenta previa, genital herpes (SOGC, 2005). Two or more caesarean sections was also included as a relative contra-indication, as it was not routine practice at St Mary’s Hospital Centre to offer these women a trial of labour at the time. If any of these criteria were present in the obstetrical file, the women were not approached to complete the survey portion of the study, and the
following was recorded from their medical chart: the reason for ineligibility, the date of delivery, the mode of delivery and the counseling physician (obstetrician vs. family physician).

All women without one of the indicated reasons were considered to have been eligible for a trial of labour, and the following information was obtained from their medical chart: date of delivery, delivery method, the counseling physician, days post-partum, gravida/parida/aborta, age, date of first caesarean section, reason for previous caesarean section, previous vaginal birth and date of previous vaginal birth if applicable, weight at last visit, weight gain, height (if available from chart), BMI, hypertension in current pregnancy, gestational diabetes in current pregnancy, weight of the baby, country of origin, and other pregnancy complications. If height was not indicated in the chart, the women were asked to give a self-reported height when they were approached with the questionnaire. Authorization to examine the medical files of the women was given by the Direction of Professional Services at St Mary’s Hospital Centre, and further consent for the survey portion of the study was obtained from the women.

On average, the women were approached with the questionnaire on their second post-partum day. Since women who have had a caesarean section stay in hospital for three days post-partum, this was considered the best balance between allowing recovery time, and having adequate time for women to consider informed participation in the study.

During recruitment encounters, the research assistant (myself) introduced herself to the women, and asked to discuss a research study with them. After obtaining this permission, a brief overview of the study was given and the different parts of the consent form explained. If the woman consented to the study, the consent form was completed, and then the woman was given the questionnaire. If a woman asked for more time to consider the study, the research assistant would return the next day to elicit the women’s final decision. If a woman declined participation, this was recorded with the reason (if the participant was comfortable giving one). This encounter would take place, either in French or in English depending on the preference of the participant. The questionnaire was
self-administered. However, since it took between five and ten minutes to complete, the research assistant would remain in the room and answered any queries from the participant. If the participant did not want to complete the questionnaire at that moment, a later time to return for the completed questionnaire would be agreed upon.

In addition to the questionnaire, a standardized participant-tracking sheet was created to record the complementary chart information (Appendix 1). If women from the list were missed for any reason (statutory holiday, delivered very early), their chart numbers were obtained from the case room, and the chart review completed from the medical record. These women did not complete the survey. However each woman booked for a caesarean section has a participant tracking sheet for record-keeping purposes.

The unit of analysis in this sub-study is the individual, as represented by their response to the survey. Overall, the sub-study aimed to recruit 150 participants who completed the questionnaire. According to statistics from previous years at St Mary’s Hospital, it was estimated that there would be approximately 450 repeat cesarean sections booked in the year, and approximately two-thirds of these would be eligible for a trial of labour (Brizard, 2010). As all the women over 18 on the general maternity ward would be considered eligible for the study, it was expected that a sufficient sample for analysis would be obtained over the one-year recruitment period.

### 3.4 Measurement

#### 3.4.1 Instruments

The instrument used for the study was a 21-question questionnaire, written in both French and English (Appendix 2). The objectives of the survey were set out by the principal investigator on the project “VBAC: Evaluating eligibility, offer rate and patient recall of consent for trial of labour”, who is a family physician practicing obstetrics, and the author of previously published work in
this field (Russillo, Sewitch, Cardinal, & Brassard, 2008). The questionnaire was designed by the research team to respond to the questions below:

1. Did the women discuss the risks and benefits of Vaginal Birth after Caesarean (VBAC) with their doctor?
2. Did the women discuss the risks and benefits of repeat elective caesarean with their doctor?
3. Did the women receive an information pamphlet on VBAC and repeat elective caesarean from the hospital?
4. What other sources of information did women consult before making the birth decision?
5. Whose decision was it to have a repeat elective caesarean?
6. What were important considerations in the decision to have a repeat elective caesarean?

The specific questions were developed, then refined and approved by Prof Jeannie Haggerty and Dr Balbina Russillo. Care was taken with the wording of the questions to present the two options of VBAC and repeat caesarean section as equally as possible, so as not to suggest that an inappropriate decision had been made. The document was translated into French with the assistance of members of Jeannie Haggerty’s research team, who also assisted with the formatting. The decision was made by members of the research team to use a booklet format for the questionnaire, which was believed to be simpler for the participants to complete, and the order of the questions was chosen according to standard questionnaire design (Oppenheim, 1966). Though the survey dealt with events retrospectively, other studies have suggested that women still clearly remembered their prenatal counseling and decision-making, even up to a few months later (C. L. Emmett et al., 2006). Therefore, questioning women post-delivery should be free from significant recall bias.

After the initial draft of the questionnaire was completed, it was tested cognitively by the research assistant, in both French and English, with four lay participants, and four women who were eligible for inclusion in the study. The purpose of cognitive testing is to determine if the questions are being understood in the same manner by the researchers and participants to ensure that the desired information is obtained. The interviewer used both scripted probes with the participants (i.e. meaning of the word “confidence), and spontaneous probes
which varied depending on the reaction of the participants (Willis, 1999). The protocol followed for the cognitive testing was performed based on the recommendations from G.B Willis, Research Triangle Institute (Willis, 1999). In general, participants had no trouble with the instructions, and word choices.

Of particular importance for this sub-study were three questions, which gathered information on whose decision it was to have a second caesarean section, the women’s reasons for a caesarean section, and sources of information respectively. The question eliciting who made the decision for a second caesarean section originally made a forced choice between two options: “It was my decision” and “It was my doctor’s decision”. However, it was felt that this did not recognize the increased importance of patient-physician collaboration in the decision–making process (Little et al., 2008) or the role of the women’s partner (Fenwick et al., 2006). In the final question below (Figure 3), there were four possible descriptors of the decision. For the analysis, decisions were classified into a binary variable (wholly physician recommendation versus all other categories with some patient-involvement) to specifically examine physician-driven decision-making.

**Figure 3: Question eliciting Physician and Patient Involvement in the Decision for a Second Caesarean Section**

<table>
<thead>
<tr>
<th></th>
<th>Please choose one sentence which best describes how the decision to have a second caesarean section was made:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ It was wholly my decision</td>
</tr>
<tr>
<td></td>
<td>□ It was a decision I made after discussion with my doctor and spouse</td>
</tr>
<tr>
<td></td>
<td>□ It was a decision I made after discussion with my doctor</td>
</tr>
<tr>
<td></td>
<td>□ It was wholly the recommendation of my doctor</td>
</tr>
</tbody>
</table>

The question eliciting reasons for choosing a second caesarean section was primarily informed by a qualitative study by Emmett et al, which looked at decision-making for women with a previous caesarean section (C. L. Emmett et al., 2006). In order to apply the results from that study in a quantitative manner,
reasons why women preferred a caesarean section were listed as response options. These reasons were all chosen because they were concerns that influenced the women during the pre-natal period. Added to this list was “strong recommendation from partner, friends or family”, as a counter-balance to the reason “strong recommendation from my doctor”, in acknowledgement that women’s decision-making in this situation is influenced by their partners, in addition to their physician, as has also been found in the published literature (Fenwick et al., 2006; Moffat et al., 2007). After the cognitive testing, an additional reason, “I thought that it would be safer for my baby”, was added because it was brought up by a participant, and confirmed by subsequent repetition. Figure 4 is the final version of this question:

Figure 4: Question eliciting Women’s Reasons for Caesarean Section

There are many different reasons for having a second caesarean section. The list below includes examples from several women’s experience:

18. Check all responses that most closely match what was important to you.

- [ ] I had a previous caesarean section, and it was a positive experience
- [ ] I thought that having a caesarean section would be safer for my baby
- [ ] I did not want the birth to impact my sex life
- [ ] I wanted to be able to choose the exact day when my baby would be born
- [ ] I was afraid of giving birth vaginally
- [ ] I didn’t think that I would be able to successfully have my baby vaginally
- [ ] I felt that another caesarean was my only option
- [ ] I had a strong recommendation from my doctor to have a second caesarean section
- [ ] I had a strong recommendation from my partner/family/friends to have a second caesarean section
- [ ] Other (Please specify);

Women were invited to choose as many reasons as they felt were applicable. Additional comments from the “other” category were re-coded as existing reasons where possible or used to form new reasons. It was assumed that
if a box was not checked for a reason, then the woman had felt this was not an important factor in her decision-making.

For the question eliciting women’s information sources, standard sources of information were listed, and participants were invited check as many as applied, since previous studies on decision-making had found that many women used a combination of sources (Moffat et al., 2007). Sources of information were considered as any item, entity or personal interaction that had an influence on the decision-making of the participant. No new sources of information were added after the cognitive testing. As with the reasons for caesarean section, women were invited to choose as many sources as they had used. It was assumed that any unchecked box was an information source not used by the participant. Figure 5 is the final version of the question:

**Figure 5: Question Eliciting Sources of Information Used By Women in Decision-making**

<table>
<thead>
<tr>
<th>Women deciding to have a second caesarean section get information from many places.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. <strong>Thinking back, what sources of information did you use to help with this decision?</strong></td>
</tr>
<tr>
<td><em>Check all that apply</em></td>
</tr>
<tr>
<td>□ Pre-natal discussion with my physician</td>
</tr>
<tr>
<td>□ Discussions with my partner, family or friends</td>
</tr>
<tr>
<td>□ Information pamphlet(s)</td>
</tr>
<tr>
<td>□ Internet</td>
</tr>
<tr>
<td>□ Books</td>
</tr>
<tr>
<td>□ Media sources (magazines, newspapers, radio, television)</td>
</tr>
<tr>
<td>□ Other</td>
</tr>
</tbody>
</table>

Under the most common sources of information, this sub-study examined the impact of a pamphlet that is provided to women by their physician during prenatal counseling. Women were invited to report if they remembered receiving the pamphlet during their pre-natal period. If they remembered, in the follow-up questions the participants were invited to rate the usefulness of the pamphlet in: i) understanding the risks and benefits of VBAC, ii) understanding the risks and
benefits of caesarean section, and iii) decision-making, on a scale of one to four (1- Not at all, 2- A little, 3- Moderately, 4- A lot), (Question 11-14, Appendix 2).

### 3.4.2 Potential predictors and confounders

The potential predictors and confounders in this study all relate to the patient-physician counseling process. These variables were selected because they have the potential to affect the communication, and the relationship between the patient and their physician (Kamal et al., 2005). Demographic variables (language and university education) may also impact interpretation of numerical information about the two birth options, affecting overall decision-making (Reyna et al., 2009). Considering only the physician, previous work has shown higher rates of caesarean section among women counselled by obstetricians compared to other health care professionals. This suggests different practices between professional groups might also affect decision-making (Deline et al., 2012; Harris et al., 2012; Mahoney & Malcoe, 2005).

From the questionnaire, information was gathered about the participant’s country of origin, length of time in Canada, principle language spoken in the home, and education level. Whether the counselling physician was a family doctor or an obstetrician was obtained from the women’s medical records. All the variables were coded in binary form for the analysis.

### 3.5 Data Analysis

From the chart data, age, gestational age (weeks), gravida/parida/aborta, weight at last visit (kg), weight gain (kg) and the weight of the baby (g) were all treated as continuous variables. The following were treated as categorical variables: delivery mode (vaginal or caesarean), gestational diabetes (yes or no), gestational hypertension (yes or no), previous vaginal delivery (yes or no), doctor (obstetrician or family physician), and country of origin (Canada or other). Basic descriptive statistics of the sample population were done using a frequency distribution for categorical variables, and means with standard deviation for the
continuous variables to measure the central tendency and spread of the variables. No data imputation was done in this sub-study.

These characteristics were then compared between three groups (participants, refusals, and non-contacted potential participants). To test for statistical significance, ANOVA was used for the continuous variables, and the Fischer’s exact test for categorical variables due to the small sample size. Additional demographic variables from the questionnaire were not compared between the groups because the information was only available from the completed questionnaires.

Basic descriptive statistics were also used to describe the main variables of interest: decision-making, reasons for caesarean section, sources of information and use of the hospital-provided information pamphlet. Parameter estimation of the each of the dependent variables was reported with 95% confidence intervals based on the normal approximation. The women’s ratings of the pamphlet were reported with mean and standard deviation to measure spread and central tendency.

It was hypothesized that women’s demographic characteristics and counselling physician would be associated with the main variables of interest. More specifically that women who a) did not have a university education, b) were not from Canada c) had spent less than five years in Canada, d) did not speak either official language, or e) were counselled by an obstetrician, would be more likely to report physician-based decision-making and/or a physician-driven reasons for caesarean section. It was further hypothesized that the previously mentioned demographic characteristics of women (a-d) would also be associated with: i) the use fewer individual information sources or fewer sources overall, ii) not receiving the pamphlet, and/or finding the information provided in the pamphlet less helpful. In terms of the relationship of the three main variables to each other, it was hypothesized that selecting physician-based reasons and using fewer information sources would be associated with solely physician-driven decision-making.
The Fischer’s exact test, or the chi-square test where applicable, was used to test these hypotheses. Due to the small sample size, the sub-study has an increased chance of rejecting the alternate hypothesis when it is true (Type II error, $\beta$). To adjust for this, an increased $\alpha$ level of $p = 0.1$ was used as the threshold for statistical significance. All the data was analysed using IBM SPSS Statistics Version 19.

3.6 Power Calculation

This sub-study expected a fixed sample size due to the restricted duration of the data collection (one year). At an estimated sample size of 150 participants, the sub-study yields approximately 70 % power to detect a small to moderate effect sizes (0.2-0.3) between groups, but the power decreases with lower effect size, and lower sample size. The power calculation for this study was performed by a statistician at St Mary’s Hospital Centre, using R version 2.13.0 and function pwr.chisq.test of the pwr package. The test was performed based on the expected sample size, the use of the chi-square test for analysis and the Cohen’s w statistic, which measures the effect size for the chi-square test (Appendix 4).

The expected precision of the proportion estimates was also calculated by the same statistician at an $\alpha$ level of $p = 0.1$. From the analysis, this sub-study had expected confidence interval half-widths of between 0.04 and 0.12, depending on the size of the sample being used and the proportion estimate (Appendix 5).

3.7 Ethical Considerations

The following ethical considerations were based on the Tri-council Policy Statement, which has three core principles: respect for persons, concern for welfare and justice (Canadian Institute of Health Research, December 2010).

As the recruiting was done in a hospital setting, care was taken to ensure that the research assistant was correctly identified to staff, and to patients in her proper role, not as a physician, or nurse. It was considered that discussion about the mode of delivery of the child could be a sensitive topic, if the woman felt that
her choices were being judged. Therefore, the consent form emphasized voluntary participation and that there would be no loss of any benefit from a refusal. Women were excluded from participation in the study if they were admitted to the Intensive Care Unit or if there was an infant death, as participation may have increased their distress. Women with insufficient French or English to understand the study were also excluded, due to the inability to obtain full informed consent.

To guard the confidentiality of the participants, medical chart numbers were recorded in place of names, and only a study identification number linked the respondent’s completed questionnaire to their other information. Access to study data was given only to the research team, and to the Ethics Review Board of St Mary’s Hospital Center as needed for ethical review. This study was reviewed and approved by the St Mary’s Hospital Centre Research Ethics Board.
4.0 Results

4.1 Study Population

Participants were recruited from January 23 2012 to January 23 2013. Figure 6 shows a flow-chart outlining the stages of the subject recruitment and where women were excluded:

Figure 6: Selection Tree Showing Participant Numbers and Exclusions/Losses
Of the total 424 repeat caesarean sections recorded at St Mary’s Hospital Centre, 64.2 % of the women were eligible for a trial of labour, according to the 2005 guidelines of the Society of Obstetrics and Gynaecology. There were 15.1 % of the women excluded because of insufficient command of both French and English, admission to the Intensive Care Unit, or infant death. Some potential participants (16) whose infants were admitted to the Intermediate Care Nursery were initially excluded due to confusion over whether or not to include these women. However, further discussion amongst the research team ruled for their inclusion in the latter half of the recruitment period. The overall contact rate for the study was 75.8% (175 women). The reasons for non-contact of a potential participant include: statutory holidays, women delivering before the date of their booked caesarean section, and women leaving earlier than the standard three days post-partum. As well, at the beginning of the recruitment five women were excluded due to indications in their chart that they chose a vaginal delivery.

All in all, of the women approached with the survey, 26 declined to participate (15%). Women refused participation for the following reasons: did not want to sign the consent form (one woman), did not feel the questionnaire applied because she wanted a vaginal birth (one woman), did not have time before leaving (two women), visitors (three women), not feeling well (four women), or not interested (15 women). Three questionnaires were not returned. It is unknown whether these were refusals of participation or missing data. The final sample for this sub-study was 146 women, who completed the study questionnaire. The characteristics of the study sample can be found in Table 1.

4.2 Comparison of Study Participants, Refusals, and Participants not Contacted

Variables from the chart abstraction were compared across i) those who completed the questionnaire (n = 146), ii) those who refused participation or whose questionnaires were not returned (n = 29) and iii) those whom were not contacted (n = 56). Further demographic variables from the questionnaire are described for the sample only, also in Table 1.
Overall, the women who were not contacted were more likely to delivery vaginally (35.7 % vs. 2.7/6.9 %), than the other two groups (p < 0.001). This result was expected because the women who delivered vaginally went into spontaneous labour before their booked date for caesarean section, and stayed in hospital for a shorter period (two days or less). These two reasons were the main causes for non-contact of a potential participant.

With the small sample sizes of the groups, special attention was paid to possible variation between the groups that was not statistically significant. For example, women that were not contacted were seen less often by an obstetrician (87.5 % vs. 94.5/93.1%), and a slightly larger proportion of these women were Canadian born (33.3 % vs. 25.3/28.6 %) than in the other groups. These differences are interesting to note in lieu of the fact that a higher percentage of the women in the un-approached group delivered vaginally. There could possibly be a trend of women born in Canada, seen by family physicians, being more likely to deliver vaginally. However, a larger sample size would be needed to further test this potential association.

There may also be small difference in height and weight gain between those women approached with the questionnaire, and those not approached (the non-approached women gained slightly less weight, and had slightly smaller babies). However, these differences do not seem to be clinically significant and could be explained by the fact that women in the non-approached group were more likely to deliver vaginally, and on average, earlier than the other women.
Table 1: Comparison of Study Participants, Refusals, and Non-contacted Participants for Medical and Socio-demographic Variables Obtained from the Chart Review and the Questionnaire

<table>
<thead>
<tr>
<th>Variables</th>
<th>Women who Completed the Questionnaire (n = 146)</th>
<th>Women who refused participation (n= 29)</th>
<th>Women who were not contacted (n=56)</th>
<th>Test for Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± Standard Deviation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medical Characteristics Pertaining to Past Pregnancy or Pregnancies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravida</td>
<td>2.6 ± .89</td>
<td>2.9 ± 1.1</td>
<td>2.8 ± 1.3</td>
<td>p = 0.151</td>
</tr>
<tr>
<td>Parida</td>
<td>2.0 ± .20</td>
<td>2.1 ± 0.26</td>
<td>2.1 ± 0.53</td>
<td>p = 0.558</td>
</tr>
<tr>
<td>Aborta</td>
<td>0.53 ± .86</td>
<td>0.79 ± 1.1</td>
<td>0.72 ± 1.1</td>
<td>p = 0.269</td>
</tr>
<tr>
<td>Previous vaginal delivery (no)</td>
<td>95.9%</td>
<td>96.6 %</td>
<td>92.3 %</td>
<td>p = 0.595</td>
</tr>
<tr>
<td><strong>Medical Characteristics Pertaining to Most Recent Pregnancy Only</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery Mode VBAC</td>
<td>2.7 %</td>
<td>6.9 %</td>
<td>35.7%</td>
<td>p = 0.000</td>
</tr>
<tr>
<td>Mean Gestational Age at Delivery (weeks)</td>
<td>38.8 ± 0.85</td>
<td>38.9 ± 0.62</td>
<td>38.7 ± 1.15</td>
<td>p = 0.669</td>
</tr>
<tr>
<td>Gestational Diabetes (yes)</td>
<td>15.7 %</td>
<td>10.7 %</td>
<td>15.4 %</td>
<td>p = 0.313</td>
</tr>
<tr>
<td>Gestational Hypertension (yes)</td>
<td>2.8%</td>
<td>0%</td>
<td>5.9%</td>
<td>p = 0.507</td>
</tr>
<tr>
<td>Weight at last prenatal visit (kg)</td>
<td>82.0 ± 13.3</td>
<td>84.5 ± 12.4</td>
<td>82.0 ± 12.8</td>
<td>p = 0.823</td>
</tr>
<tr>
<td>Weight gain during pregnancy (kg)</td>
<td>12 ± 5.4</td>
<td>14.3 ± 6.5</td>
<td>11.2 ± 5.6</td>
<td>p = 0.088</td>
</tr>
<tr>
<td>Weight of the baby at birth (g)</td>
<td>3458.2 ± 431.4</td>
<td>3487.2 ± 354.3</td>
<td>3276.1 ± 533.4</td>
<td>p = 0.094</td>
</tr>
<tr>
<td>Counseling physician (Obstetrician)</td>
<td>94.5 %</td>
<td>93.1%</td>
<td>87.5%</td>
<td>p = 0.218</td>
</tr>
<tr>
<td><strong>Socio-demographic Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>33.5 ± 4.01</td>
<td>33.0 ± 4.4</td>
<td>33.4 ± 4.2</td>
<td>p = 0.861</td>
</tr>
<tr>
<td>Country of Origin (Other than Canada)</td>
<td>74.7%</td>
<td>71.4%</td>
<td>66.7 %</td>
<td>p = 0.582</td>
</tr>
</tbody>
</table>
The baseline characteristics of this sample show a diverse population, with more than half of the sample being university educated (67.1%). Approximately three-quarters of the women were born outside of Canada from the Middle East, South America, Eastern Europe, Africa and Asia. The languages the women speak in the home were also representative of this diversity, with 37% of the sample speaking a language other than French or English. This is reflective of the area in which St Mary’s Hospital Center is situated; Cote-des-Neiges is the most culturally diverse neighborhood in Montreal. The number of participants with a university education may also be indicative of an immigrant population, as high levels of education are often required to immigrate into Canada.

4.3 Results Regarding the Delivery Decision

4.3.1 The decision for a second caesarean section

For the first objective, examining features of decision-making, of particular interest were the decisions reported as wholly physician-driven, since the obstetrical guidelines state that these women could have tried for a vaginal delivery (SOGC, 2005). There were four participants (2.7%) who did not respond to the question. After reviewing the questionnaires, it was found that three of these women indicated in their comments that they had wanted a vaginal birth. The fourth woman had selected the doctor’s recommendation as her only reason.
for caesarean section. This last woman was classified as a physician-driven decision, but the other women could not be classified into a decision type, and were excluded from the analysis. The percentage distribution for women’s decision-making is shown in Table 2:

<table>
<thead>
<tr>
<th>Decision for second caesarean section (n= 143)</th>
<th>Percentage</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>It was wholly my decision</td>
<td>23.8% (34)</td>
<td>16.7-30.8%</td>
</tr>
<tr>
<td>I made the decision after discussion with my doctor and partner</td>
<td>37.0% (53)</td>
<td>29.0-45.1%</td>
</tr>
<tr>
<td>I made the decision after discussion with my doctor</td>
<td>16.1% (23)</td>
<td>10.0-22.2%</td>
</tr>
<tr>
<td>It was wholly the recommendation of my doctor</td>
<td>23.1% (33)</td>
<td>16.1-30.1%</td>
</tr>
</tbody>
</table>

While most women reported involvement in the decision-making, still almost a quarter of the sampled women reported that the decision was wholly the recommendation of their physician. This is contrary to the obstetrical guidelines, which state that these women should be participating in the decision-making process (SOGC, 2005). Despite the proposed hypothesis, the analysis did not find any statistically significant associations between particular profiles of women and the likelihood of reporting a wholly physician-driven decision. There was also no difference seen between the patients of family physicians and obstetricians in terms of physician-driven decision-making despite evidence in the literature that obstetricians may be more likely to have the women they counsel deliver by caesarean section (Harris et al., 2012; Mahoney & Malcoe, 2005). This was most likely due to the low number of women in the sample being counseled by family physicians (5.5%).

4.3.2 Reasons for repeat caesarean section

Secondly, this sub-study explored women’s self-reported reasons for caesarean section. Either alone or in addition to selecting one or more of the offered reasons, there were 47 women who wrote comments. These comments
were used to form six new categories of reasons: 1) wanted a vaginal birth, 2) negative previous birth experience, 3) concerns for the safety of the mother, 4) knowing what to expect with a caesarean delivery, and 5) concerns for family, and caring for other children, 6) personal choice for caesarean section. Below are example quotations for each of the new categories:

Table 3: Additional Reasons for Caesarean section from Women’s Comments in Descending Order of Endorsement

<table>
<thead>
<tr>
<th>Reasons for a second caesarean section from participant comments</th>
<th>Sample Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wanted a vaginal birth (19 women)</td>
<td>“J’ai essayé d’avoir un AVAC mais à 41 semaines bébé n’était pas engagé. Je ne voulais pas d’induction” “J’ai voulu avoir un accouchement vaginal pour moi c’est plus naturel!”</td>
</tr>
<tr>
<td>Negative first birth experience (nine women)</td>
<td>“Terrible experience with first delivery” “Après césarienne d’urgence, aucun doute quant à césarienne planifiée”</td>
</tr>
<tr>
<td>Safety of the Mother (eight women)</td>
<td>“Moins de risque pour moi”</td>
</tr>
<tr>
<td>Knew what to expect (five women)</td>
<td>“Because I had a caesarean section the first time, I knew what to expect. If I had had a vaginal birth the first time, I probably would have wanted that again”</td>
</tr>
<tr>
<td>Better for the family/taking care of other children (three women)</td>
<td>“Have two other children. Easier to plan”</td>
</tr>
<tr>
<td>Personal choice for CS (three women)</td>
<td>“The caesarean section was easier”</td>
</tr>
</tbody>
</table>

After classifying the reasons from the comments, these were combined with the offered reasons into overarching themes to summarize general concerns in women’s decision-making. There were four final themes: 1) recommendation of doctor and concerns for safety, 2) previous birth experience and fear of labour, 3) impact on daily living, and 4) wanting a vaginal birth. The reasons that were grouped into each theme are shown in Table 4:
Table 4: Common Themes Across Reasons for Caesarean Section in Descending Order of Endorsement

<table>
<thead>
<tr>
<th>Themes</th>
<th>Reasons included</th>
<th>% total reasons chosen (n=304)</th>
</tr>
</thead>
</table>
| Doctor/Safety               | - I had a strong recommendation from my doctor to have a second caesarean section  
                              | - I felt that another caesarean was my only option                                 
                              | - I thought that having a caesarean section would be safer for my baby              
                              | - Safety of the Mother                                                             | 43.1 % (131)                  |
| Previous Experience/ Fear   | - I had a previous caesarean section, and it was a positive experience             | 38.5% (118)                   |
                              | - Negative first birth experience                                                  |                               |
                              | - Knew what to expect                                                              |                               |
                              | - Personal choice for caesarean section                                             |                               |
                              | - I was afraid of giving birth vaginally                                            |                               |
                              | - I didn’t think that I would be able to successfully have my baby vaginally        |                               |
| Impact on daily living      | - I had a strong recommendation from my partner/family/friends to have a second caesarean section  
                              | - I did not want the birth to impact my sex life                                    
                              | - I wanted to be able to choose the exact day when my baby would be born            
                              | - Better for the family/taking care of other children                                 | 11.8% (36)                    |
| Wanted a vaginal birth      | - Wanted a vaginal birth                                                            | 6.3% (19)                     |

* Individual women may have selected more than one reason for caesarean section

The themes of Doctor/Safety and Previous Experience/Fear were almost equally represented out of the total number of reasons selected (43.1% and 38.5% respectively). Approximately half of the sample (51%) chose multiple reasons for caesarean section, and therefore could possibly be in two or more themes. This is significant as it shows that women are driven by various concerns in their decision-making. The physician is essential in the decision-making process by providing information and recommendations. Out of all the proposed reasons, the most commonly chosen was the recommendation of the doctor. It was chosen either alone, or in combination with other reasons, by 40.4% of the sample. This reinforces the power of the physician to influence women. The frequencies of each of the other reasons can be found in Appendix 6. It is significant to note the prevalence of reasons relating to women’s previous experience and concerns.
about vaginal delivery in decision-making (38.5 %). The guidelines (SOGC, 2005) speak for women’s involvement in decisions about their delivery, and women’s experiences and fears represent salient concerns of which physicians need to be aware, and discuss in the counseling process.

Uniquely, there was a subset of women in the sample (n = 19, 13 %) who did not choose any of the offered reasons. These women exclusively indicated that they had preferred to try for a vaginal birth, and formed the entire fourth theme (“Wanted a vaginal birth”). These women all reported a physician-driven decision, except for three women who did not answer the question about decision-making. These women are important to note because many of them were booked for caesarean section later in term (at 40 or 41 weeks) to wait for spontaneous labour. Some of these women had their scheduled caesarean section because they did not go into spontaneous labour. The remaining women, who did go into spontaneous labour, either delivered successfully vaginally or had an emergency caesarean section after a failed trial of labour. These observations indicate that a booked caesarean section is not necessarily indicative that a woman will have, or wants only a caesarean delivery.

In order to provide a clearer picture of the relationship between different themes and women’s reported decision-making, the subset of 54 (37.0 %) respondents who selected only one reason were analyzed. This was done to avoid confounding from women selecting reasons in different themes. The number of women who selected each reason is displayed in Table 5:
Table 5: Distribution of Reasons for Caesarean Section Among Women Who Only Selected One Reason in Order of Decreasing Frequency

<table>
<thead>
<tr>
<th>Women who only selected one reason (Total = 54)</th>
<th>Frequency (Times chosen)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>I had a strong recommendation from my doctor to have a second caesarean section</td>
<td>46.3 % (25)</td>
<td>32.6-60.0%</td>
</tr>
<tr>
<td>I had a previous caesarean section, and it was a positive experience</td>
<td>14.8 % (8)</td>
<td>5.0-24.4%</td>
</tr>
<tr>
<td>I didn’t think that I would be able to successfully have my baby vaginally</td>
<td>11.1 % (6)</td>
<td>2.4-19.8%</td>
</tr>
<tr>
<td>I was afraid of giving birth vaginally</td>
<td>9.3 % (5)</td>
<td>1.3-17.2%</td>
</tr>
<tr>
<td>I had a strong recommendation from my partner/family/friends to have a second caesarean section</td>
<td>7.4 % (4)</td>
<td>1.9-14.6%</td>
</tr>
<tr>
<td>I thought that having a caesarean section would be safer for my baby</td>
<td>7.4 % (4)</td>
<td>1.9-14.6%</td>
</tr>
<tr>
<td>I felt that another caesarean was my only option</td>
<td>3.7 % (2)</td>
<td>0 -8.9%</td>
</tr>
<tr>
<td>I did not want the birth to impact my sex life</td>
<td>0 %</td>
<td>0 - 0.98 %</td>
</tr>
<tr>
<td>I wanted to be able to choose the exact day when my baby would be born</td>
<td>0 %</td>
<td>0 - 0.98%</td>
</tr>
</tbody>
</table>

Similar to the entire sample, the recommendation of the doctor was the reason most frequently chosen (46.3%), again emphasizing the importance of the physician in the decision. The next five highest reasons were all classified in the Previous Experience/Fear theme, demonstrating the strength of this theme too. The reasons: “I did not want the birth to impact my sex life” and “I wanted to know the exact day when my baby would be born” were not endorsed at all. Since the women in this subset only selected one reason each, these last two reasons do not seem to be strong enough on their own to drive decision-making.

The women who only selected one reason for a caesarean section (n = 54, 37.0 %) were classified as having selected a “Doctor/Safety” reason or “Previous experience/Fear” reason based on the final themes. There were no women who indicated that they had preferred a vaginal delivery, and only four women who fell into the theme, “Impact on Daily Living”. Those four women were grouped with the Previous Experience/Fear theme for the purpose of this analysis, as these
reasons were considered more similar to this theme than to the Doctor/Safety theme. There were no statistically significant associations between any of the demographic variables, and whether a woman had selected their reason in the Previous Experience/Fear or the Doctor/Safety theme. This lack of statistical significance may be in part due to the small sample size.

However, only 4.3 % of the women who selected their reason in the Previous Experience/Fear theme reported a wholly physician-driven decision, compared to 58.1 % of the women who only selected a Doctor/Safety reason (p < 0.001). This suggests that if a woman has a strong concern about her delivery experience, this would be reflected by increased participation in the decision-making. Conversely, if a woman is relying solely on the information provided by her doctor, she may feel like she participated less in the decision-making process.

This sub-study was also interested in examining whether having multiple reasons for a caesarean section affected the type of reported decision-making. 51.4 % (75 women) of the sample chose two or more reasons, which are displayed in Table 6. In this sub-group, concerns about the safety of the baby were the most often endorsed. However, there was no discernable co-occurrence of reasons.

Table 6: Distribution of Reasons for Caesarean Section Among Women Who Selected Two or More Reasons in Order of Decreasing Frequency

<table>
<thead>
<tr>
<th>Women who chose 2 or more reasons for a second caesarean section (Total = 75)</th>
<th>Frequency (Times chosen)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>I thought that having a caesarean section would be safer for my baby</td>
<td>62.7 % (47)</td>
<td>51.5-73.9%</td>
</tr>
<tr>
<td>I had a strong recommendation from my doctor to have a second caesarean section</td>
<td>45.3 % (34)</td>
<td>33.8-56.9%</td>
</tr>
<tr>
<td>I didn’t think that I would be able to successfully have my baby vaginally</td>
<td>41.3 % (31)</td>
<td>30.0-52.7%</td>
</tr>
<tr>
<td>I had a previous caesarean section, and it was a positive experience</td>
<td>38.7 % (29)</td>
<td>27.4-50.0%</td>
</tr>
<tr>
<td>I was afraid of giving birth vaginally</td>
<td>29.3 % (22)</td>
<td>18.8-40.0%</td>
</tr>
<tr>
<td>Reason</td>
<td>Percentage</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>I had a strong recommendation from my partner/family/friends to have a second caesarean section</td>
<td>25.3% (19)</td>
<td>15.3-35.4%</td>
</tr>
<tr>
<td>I felt that another caesarean was my only option</td>
<td>14.7% (11)</td>
<td>6.5-22.9%</td>
</tr>
<tr>
<td>I wanted to be able to choose the exact day when my baby would be born</td>
<td>10.7% (8)</td>
<td>3.5-17.8%</td>
</tr>
<tr>
<td>I did not want the birth to impact my sex life</td>
<td>2.7% (2)</td>
<td>0-6.4%</td>
</tr>
</tbody>
</table>

Women who selected multiple reasons for caesarean section very often chose reasons in different themes simultaneously: mostly the Doctor/Safety theme and the Previous Experience/Fear theme. Reasons from the Previous Experience/Fear theme correlated with greater patient involvement in decision-making in women who selected only one reason. Fewer women who selected two or more reasons reported a wholly physician-driven decision as compared to women who had only selected one reason (12.0 % vs. 35.2 %, \( p = 0.002 \)). This could be explained by the greater prevalence of reasons in the Previous Experience/Fear theme among women who selected multiple reasons. Women born in Canada may be more likely to choose two or more reasons for caesarean section (71.9 % vs. 53.6 %, \( p = 0.069 \)). They may also be less likely to report solely physician-driven decisions, with respect to the previous finding that women with two or more reasons may participate more in decision-making.

In general, many of women’s reasons for caesarean section relate to the discussion with their physician. However, women participate more in the decision-making process when they have strong concerns based on their previous delivery experience and/or about the upcoming delivery.

### 4.3.3 Sources of information

The third objective of this sub-study was to examine women’s sources of information. There were nine women who indicated that they did not need to use any information sources, and nine women who indicated that they did not use any information sources; these women were excluded from the analysis. The
distribution of the sources of information used is described in the table below in order of most to least used:

**Table 7: Commonly Used Sources of Information in Decision-making in Decreasing Order of Use**

<table>
<thead>
<tr>
<th>Sources of Information used by the women (n = 128)</th>
<th>Percentages</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prenatal discussion with physician</td>
<td>82.0 %</td>
<td>75.3- 88.7%</td>
</tr>
<tr>
<td></td>
<td>(105)</td>
<td></td>
</tr>
<tr>
<td>Discussion with partner, friends, family</td>
<td>64.1 %</td>
<td>55.6- 72.5%</td>
</tr>
<tr>
<td></td>
<td>(82)</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>46.1 %</td>
<td>37.3-54.8%</td>
</tr>
<tr>
<td></td>
<td>(59)</td>
<td></td>
</tr>
<tr>
<td>Information pamphlet</td>
<td>36.7 %</td>
<td>28.3- 45.2%</td>
</tr>
<tr>
<td></td>
<td>(47)</td>
<td></td>
</tr>
<tr>
<td>Book(s)</td>
<td>12.5 %</td>
<td>6.7-18.3%</td>
</tr>
<tr>
<td></td>
<td>(16)</td>
<td></td>
</tr>
<tr>
<td>Other media sources (magazines, newspapers, radio, television)</td>
<td>9.4%</td>
<td>4.3-14.5%</td>
</tr>
<tr>
<td></td>
<td>(12)</td>
<td></td>
</tr>
<tr>
<td>Other: Examples from participants: previous experience, nurse</td>
<td>6.3 %</td>
<td>2.0-10.5%</td>
</tr>
<tr>
<td></td>
<td>(8)</td>
<td></td>
</tr>
</tbody>
</table>

NB- Individual women may have selected more than source of information

In total, 29 women (22.7 %) reported using only one information source, 38 women (29.7 %) used two sources, 31 (24.2 %) used three sources, 20 women (15.6 %) used four sources, nine women (7.0 %) used five sources, and one woman (1.0%) used six sources. The majority of women who only used one source of information relied on the discussion with their physician (n = 19, 65.5 %). While it was expected that women would rely heavily on their physician for information, it was interesting to note that many women with only one information source relied on a source other than the physician.

For the women who reported that they did not/did not need to use any sources of information, there was no statistically significant association with any demographic variables. The same result was found for women who reported using a pre-natal discussion with their partner/friends/family, or books/media/other sources. This suggests that using, or not using, any of these sources is not linked to any particular demographic trait.
Overall, having a university education was associated with the use of the most number of different information sources. Women with a university education were more likely to report using the discussion with their doctor in the decision to have a second caesarean section (73.3 % vs. 47.8 %, p = 0.017), using an information pamphlet (78.7 % vs. 63.3 %, p = 0.064), and using the Internet (76.3 % vs. 62.3 %, p = 0.090). Interestingly, while there was overlap between the other demographic characteristics, and the use of some information sources, university education was the only predictor of selecting the discussion with the doctor as being used in the decision. The Internet and information pamphlets both have similar profiles of women who are more likely to report using these sources. Women who were born in Canada were more likely to report using an information pamphlet (52.9 % vs. 30.9 %, p = 0.022), and using the Internet in the decision (58.8 % vs. 41.5 %, p = 0.082). This was substantiated by the result that women who spoke English/French in their home were also more likely to use the same sources: information pamphlet (74.5 % vs. 55.6 %, p = 0.033), and the Internet (71.2 % vs. 55.1 %, p= 0.061).

In terms of decision-making and the use of specific information sources, women who reported discussing the decision with their partner, friends or family were more likely to report that they were involved in the decision than women who did not (71.3 % vs. 36.0 %, p = 0.001). Perhaps because these women felt more supported to engage in the decision-making process. Also, women who reported using no information sources were more likely to report that the decision was wholly physician-driven (47.1 % vs. 19.8%, p = 0.027), which makes sense, as the women had no other information.

This sub-study also examined how the number of information sources a woman used affected her decision-making. For this analysis, women were divided into those who a) did not use any information sources, b) used one information source, c) used two information sources, d) used three information sources, and e) used four, five or six information sources, to create groups approximately equal in number.
Generally, women with a university education were more likely to use a higher number of sources of information overall (88.3 % four, five or six sources vs. 48.3 % one information source, \( p = 0.039 \)). This coincides with the previous finding that women with university are more likely to report using certain information sources, such as the prenatal discussion with their physician, an information pamphlet and the Internet. In terms of decision-making, women who had a higher total of information sources were less likely to report a solely physician-driven decision (13.8 % four, five or six sources vs. 47.1 % one information sources, \( p = 0.042 \)). One explanation for this observation is that these women may have done more research on their options for birth after caesarean section, and therefore felt more involved in the decision-making. These women were more likely to have a university education, which could also help with data interpretation and communication skills needed to engage in decision-making about health issues (Reyna et al., 2009; Sharma et al., 2011).

Since an information pamphlet on the risks and benefits of VBAC and repeat caesarean section is part of routine pre-natal care at St Mary’s, this study examined this information source more closely. Of the total sample of women, only 38.4 % (95 % CI: 30.4 -46.3%) reported receiving this pamphlet. Overall, more Canadian born women received the pamphlet than immigrant women (54.1 % vs. 33.0 %, \( p = 0.023 \)). Corroborating these results, women who spoke French or English in the home were more likely to receive the pamphlet as well (71.4 % vs. 57.8 %, \( p = 0.097 \)). This suggests that there is a disparity in the distribution of the pamphlet. Particular to immigrant women, the amount of time that a woman had been in Canada also affected the likelihood of her receiving the pamphlet, with women who had been in Canada longer being more likely to have received it (42.2 % vs. 27.0 %, \( p = 0.098 \)).

The women who indicated that they received the pamphlet were asked to complete four further questions on its usefulness. All the women completed these questions, except one. The average ratings for each question are summarized in Table 8:
Table 8: Women’s Average Ratings of the Usefulness of the Physician Provided Pamphlet in the Decision to have a Second Caesarean Section

<table>
<thead>
<tr>
<th>Women’s rating of the pamphlet (n = 55)</th>
<th>Average usefulness of the pamphlet*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding the risks and benefits of VBAC</td>
<td>3.5 ± 0.89</td>
</tr>
<tr>
<td>Understanding the risks and benefits of repeat caesarean section</td>
<td>3.2 ± 0.86</td>
</tr>
<tr>
<td>In the decision to have a second caesarean section</td>
<td>2.3 ± 1.14</td>
</tr>
<tr>
<td>Satisfaction with quality</td>
<td>3.3 ± 0.71</td>
</tr>
</tbody>
</table>

* 1- Not at all, 2- A little, 3- Moderately, 4- A lot

To analyse whether the pamphlet helped women understand the risks and benefits of VBAC and repeat elective caesarean section, and in making the decision, the women were grouped into: i) those that found the pamphlet not at all, or a little helpful and ii) those who found it helped moderately or a lot. The women were divided in this way on the assumption that women who were in the first two categories were more similar to each other than women who found that the pamphlet helped moderately or a lot.

Overall, the women seemed to understand the risks and benefits of both delivery options moderately well (Average ratings; VBAC = 3.5, Caesarean Section: 3.2). However, women born in Canada were more likely to report that the pamphlet was more helpful in understanding this information (Risks and benefits for VBAC, p = 0.038; Risks and benefits of repeat caesarean section, p = 0.074). For both VBAC and repeat caesarean section, all the women born in Canada (100.0 %) reported that the pamphlet helped them moderately or a lot in understanding the risks and benefits of both options. This suggests that immigrant women may not understand the information in the pamphlets as well as the women born in Canada.

In looking at the usefulness of the pamphlet in decision-making, there were no demographic profiles of women who found the pamphlet more or less helpful, despite immigrant women understanding less information. However, this could be due to low statistical power from the small sample size. The pamphlet seemed to have minimal use in decision-making based on the average usefulness...
rating, which was the lowest the pamphlet received. Interestingly, despite the low usefulness rating, women who received the pamphlet were less likely to report a wholly physician-driven decision (13.0 % vs. 29.2 %, \( p = 0.025 \)), suggesting it may prompt women to participate in the decision-making process.

Overall demographic characteristics, such as university education and country of origin, affected women using different information sources. Women who gathered information from multiple sources, or who discussed the decision with their partner, friends or family were more likely to participate in the decision. Though the information pamphlet may not be useful to all women, providing the pamphlet might help engage women in the decision-making process.
5.0 Discussion

5.1 Most Significant Research Findings and Comparison with the Existing Literature

Overall, this sub-study found that despite the guidelines of the Society of Obstetrics and Gynaecology of Canada (SOGC, 2005) almost one quarter of the decisions for caesarean section were wholly the recommendation of the physician. Women’s reasons for a repeat caesarean section ranged from relying on their physician to incorporating their own experience and concerns about the upcoming delivery. When women had strong concerns about one delivery option or the other, they were more likely to participate in the decision-making. Women also participated more if they had had access to more information sources. However, immigrant women not only used fewer sources, but also less readily understood the information presented in the available sources, making them rely more heavily on their physician’s recommendation.

5.1.1 Decision-making

Although most women in this sub-study had some involvement in the decision-making process, ideally all women should have reported being involved in the decision following the obstetrical guidelines (SOGC, 2005). In previous studies on decision-making, the participants were relatively homogenous in background, and sample sizes were small due to the nature of qualitative research (C. L. Emmett et al., 2006). Physicians have been encouraged to involve women in decision-making about mode of delivery (NICE, 2004; SOGC, 2005; Little et al., 2008), therefore the high proportion of reported combined decision-making (53.1 %) was expected. Other literature suggests that some women have strong personal preferences for one option and may fully drive the decision-making themselves, while others trust explicitly in their healthcare provider (C. L. Emmett et al., 2006). In the present sub-study, almost a quarter of the women (23.1 %) reported wholly physician-driven decisions.
5.1.2 Reasons for caesarean section

The reasons for repeat caesarean section found in this sub-study are concerns common to other populations as well. The additional reasons for caesarean section formed from the women’s comments, and the major themes all substantiate the published literature, which emphasizes both the role of the physician and women’s own experiences (Eden et al., 2004; C. L. Emmett et al., 2006; Fraser et al., 1997; Fuglenes et al., 2011; McCourt et al., 2007; Murphy & Harvey, 1989).

Women rely on medical advice from their physician about their health and that of their child (C. L. Emmett et al., 2006; Kingdon et al., 2009; Moffat et al., 2007). Many women consider the health of their baby as their primary concern in delivery (Kingdon et al., 2009), which influences women towards a greater preference for a caesarean section because an unsuccessful trial has higher risk for the infant (Smith et al., 2002). Therefore, it is understandable that the two most chosen reasons were the recommendation of the physician, and the safety of the baby. In this sub-study, the overall frequency of reasons chosen in the Doctor/Safety” (43.1 %), and “Previous Experience/Fear” (38.5 %) themes were approximately equal. Many women selected reasons in both of these themes, emphasizing the complexity of the choice. For example, a complication in a previous vaginal delivery might make concerns about the safety of the baby more salient to the mother.

One of the other most important factors affecting a woman’s decision to have second caesarean section is her previous experience (Fenwick et al., 2006; McGrath & Ray-Barruel, 2009). When women had strong concerns relating to their previous birth experience, or fear of an unsuccessful vaginal delivery, they were more likely to participate in the decision-making. This is very relevant clinically, as some physicians may not consider discussing women’s previous experience an important part of the prenatal counseling. However, these concerns are very important to women. They are experts in their own experience with birth, just as the physician is the expert in the medical domain. Bringing these two types
of expertise together is the basis for mutual decision-making between the physician and the patient, following current practice guidelines (Charles, Gafni, & Whelan, 1997; SOGC, 2005).

In this sub-study, there were 19 women booked for an elective caesarean section who indicated that they had wanted to have a vaginal birth. Among these women, four actually did successfully deliver vaginally. Therefore, being booked for a repeat caesarean section may not always indicate that the woman wanted a caesarean delivery under all circumstances. Changing practice to further encourage, and support these women in their desire for a vaginal delivery could potentially modify the delivery outcome of this subset of repeat caesarean sections. Such changes in practice could include waiting to book the caesarean section until 41 weeks to allow the women the best chance of going into labour spontaneously, and considering induction for the woman if her cervix is favourable.

5.1.3 Sources of information

Women most often discussed the decision for a caesarean section with their physician and partner; individuals most closely involved in the decision-making process with the woman herself (Chen & Hancock, 2012; C. L. Emmett et al., 2006; Fenwick et al., 2006; Watkins & Weeks, 2009). The physician is a source of information as well as a participant in the decision-making. When a woman did not seek out additional sources of information, she was more likely to rely on the recommendation of the physician to make the decision. The prenatal encounter is crucial in passing information, not only from the physician to the patient, but also from the patient to the physician. Confusion on the part of the physician about how best to present the risks/benefits of the birth options, perhaps due to uncertainty in the current literature, or a less comfortable relationship with the woman if there is a cultural or language barrier, (Kamal et al., 2005), may jeopardize the complete transfer of necessary information between the two parties. Characteristics like not having a university education may also affect the counseling process and acquisition of information. It is important for a physician
to be aware that these may be barriers for certain women in participating in the decision-making process.

Decision-aids, such as pamphlets, have been examined in a number of previously published papers (Dugas et al., 2012; Clare L. Emmett et al., 2007; Farnworth et al., 2008; Frost et al., 2009; Shorten et al., 2005). This study provided an example of a potential decision-aid in a non-experimental condition: the pamphlet provided to patients at St Mary’s by their counseling physician. This study found that although the pamphlet is part of routine care at St Mary’s, less than half of our sample (38.4 %) received it. This may be an underestimate if some women did not remember receiving the pamphlet, or received several different pamphlets, and were not able to correctly identify the pamphlet described in the question. Potential misidentification of the pamphlet, and the low overall ratings for usefulness in decision-making, suggest that, despite its distribution, the pamphlet is not functioning well as a decision-aid.

Importantly, the sub-study’s results suggest that immigrant women are receiving the pamphlet less often than their Canadian born counter-parts. This may have been because physicians felt that the pamphlet would not be well understood, and hence were less inclined to provide these women with the pamphlet. This sub-study corroborates that assumption, as women from other countries reported understanding the information in the pamphlet less well than Canadian born women. However, this may be an important over-sight, as immigrant women already seem to have less access to information about mode of delivery after a caesarean section.

Other studies on decision-aids have found no impact on actual mode of deliveries after use (Dugas et al., 2012), and evidence suggests that women decide which mode of delivery they prefer early on in pregnancy or even immediately after their previous delivery (Clare L. Emmett et al., 2011; Moffat et al., 2007). In this sub-study, the pamphlet received the lowest average rating in usefulness for decision-making. This could be because the purpose of the pamphlet is primarily to provide information, and not to necessarily recommend one option over the other.
Though the women did not report the pamphlet as being useful in the decision, it is clinically relevant to note that women who received the pamphlet were more likely to report that they were involved in the decision-making. Therefore, the pamphlet itself is useful as a tool to initiate discussion between the woman and her physician. Ensuring that women properly understand the risks, and benefits of both options may change some women’s minds with respect to attempting a trial of labour, instead of having a repeat caesarean section.

5.1 Limitations

This sub-study sampled a relatively small number of women (n = 146). Therefore it is important to evaluate the representativeness of this sample in relation to the study population and target population for the validity of the results. Three-quarters of the women sampled were not born in Canada, ranging from women who had spent less than a year to many years in this country, and slightly more than a third of the women (37%) spoke languages other than French or English in the home. This is typical of the Cote-des-Neiges area of Montreal served by St Mary’s Hospital Centre, suggesting that the sample is representative of the study population. The specifics of the St Mary’s population may limit the generalizability of the results to other, more homogeneous, patient populations of women eligible for a trial of labour. However, many of the findings were culturally neutral, and as Canada becomes more diversified, concerns about immigrant populations and decision-making will become more important for all areas.

The major limitation for this sub-study was the small sample size (n = 146), which limited its power to find statistically significant associations (increased Type II error). This concern was addressed by discussing p-values up to 0.1. The small sample size also limited the precision of the study in estimating the proportions of types of decision-making, reasons, and information sources. Though confidence intervals for the sub-study may be larger in width, nonetheless, they do capture salient information about the study proportions. It is
also important to note that women who did not speak any English or French were excluded from the study because they would not have been able to give full informed consent. Had these women been included, associations between the demographic variables and the study variables of interest may have been different, and led to alternate conclusions. In particular, reported involvement in decision-making may have been underestimated by the exclusion of women more likely to be reliant on their physician’s recommendation.

Other potential limitations include: selection bias in the recruitment of the sample, information bias in the questionnaire, and confounding bias in the analysis. Although there was a difference in delivery method between the women approached and not approached for the study, it is assumed that no specific types of women were systematically excluded this way, as it is not possible to control for the advent of spontaneous labour. There were no other statistically significant differences between the groups on any medical or demographic variables. It is assumed that the findings on reasons and sources of information should be valid, since no particular backgrounds of women were excluded. However, the sub-study may have underestimated the proportion of women who would have wanted to attempt a vaginal birth. Consequently, this might have affected the proportion of physician-driven decisions due to the observation that all the women who wanted a vaginal birth in the sample reported a physician-driven decision.

The questionnaire was tested cognitively before the start of the study to reduce information bias. Due to the variety of languages spoken at St Mary’s, there may still have been different interpretations of the questions despite this testing. However, since only participants with a thorough command of French or English were approached and the research assistant was available for clarifications, the findings should be valid. The potential predictors and confounders in this study were all used in the analysis. It is unlikely that the confounding bias of an unmeasured variable strongly affected these results.
5.2 Significance of the Research Findings

This study provided significant and useful descriptive information on the decision-making processes of women booked for a repeat elective caesarean section. There was a strong trend of mutual decision-making between women and physicians, which supports the emphasis in modern medicine on patient involvement. This type of relationship is beneficial, as open communication with patients will allow more of the women’s own concerns to come to the surface, particularly relating to their previous delivery experience and concerns about the upcoming birth. However, there were still some decisions made wholly by the physician, contrary to the standard practice guideline (SOGC, 2005).

Overall, it can be said that the physician’s opinion, and safety concerns are highly important to patients. But, concerns about being able to successfully deliver vaginally were seen to be equally important. If physicians ensure that adequate time in a visit is spent in allowing women to verbalize their previous experiences with birth, it may help address fears of vaginal birth and consequently make women more open to attempting a trial of labour. Providing this additional support and encouragement for women wanting to have a trial of labor may shift the balance towards more successful vaginal deliveries and fewer repeat elective caesarean sections.

When counseling patients from other countries, it is important to be aware of barriers to understanding the information provided, particularly for patients with less education or who do not speak French or English as a first language, and who may generally have more difficulty accessing different information sources. The hospital-provided pamphlet is a potentially modifiable information source, which could meet part of this need through translation into multiple languages. The pamphlet could also be revised to function less as a static list of risks and benefits, but more as a decision tool to further increase the number of women who participate in the decision-making process after receiving it.
5.3 Conclusion

This study investigated women’s participation in the decision-making process by looking at whether the decision for a second caesarean section was primarily physician or patient driven, in conjunction with the reasons women gave for their decision, and their information sources. With their crucial role in the decision-making process, physicians need to be highly aware of their role in providing information about their birth options to women with a previous caesarean section, and providing opportunities for women to discuss their previous experience(s) and concerns about the upcoming birth. This whole process is even more important for women who are not born in Canada, due to potential problems of communication and information access.

Addressing these concerns, and further promoting VBAC during the prenatal counseling, may lead to more women attempting a trial of labour, and going on to have a successful vaginal birth. This in turn may reduce the rate of repeat caesarean section in Canada.
References


Appendices

Appendix 1:

Vaginal Birth After Caesarean: Evaluating Eligibility, Offer Rate and Patient Recall of Consent for Trial of Labor
Lay Title: Decisions about Delivery Options for Women with One Previous Caesarean Delivery
Principal Investigator: Dr Babina Rosello
Co-investigator: Jeannie Hageman, PhD
Research Assistant: Frances Hardley-Dwyer

Chart number: __________________________

Date recorded: __________________________

Eligible for Study:  □ yes  □ no
Reason: □ primary cesarean
□ other: ______________

Information from the chart:

Study ID: __________________________

Eligible for VBAC:  □ yes  □ no
Reason: □ previous inverted T or classical section
□ breech presentation
□ placenta previa
□ genital herpes
□ 2 or more prior C/S
□ myomectomy
□ other: ______________

Date of Delivery: __________________________

Actual Mode of Delivery:  □ Repeat elective cesarean
□ Repeat cesarean after failed TOL
□ VBAC
□ Emergency cesarean

Doctor’s name: __________________________

Completed questionnaire:  □ yes  □ no
Reason: □ patient refusal
□ other: ______________

Excluded from questionnaire:  □ insuff. Fr/Eng
□ Infant death or ICU admission
Chart Abstraction for VBAC eligible

Date approach: _____________

Days post-partum:  □ 1  □ 2  □ 3  □ 4

G ___  P ___  A ___

Age: ______

Date of 1st C/S: _____________

Reason for 1st C/S: ________________________________

Uterine Scar repair:  □ one layer  □ two layer

Previous vaginal birth:  □ yes  □ no

Date: _____________

Weight at last visit (kg): _____________

Height: ______

BMI: ______

Weight gain (kg): _____________

Weeks of gestation: ______

Weight of the baby (g): _____________

Hypertension:  □ yes  □ no

Gestational Diabetes:  □ diet  □ insulin  □ no

Other pregnancy complication:  □ yes  □ no

Complication: ________________
Appendix 2:

If you have any questions, you may contact:

Dr Babina Russillo  
Principal Investigator  
514 910 9039

or

Frances Handley-Derry  
Research Assistant  
frances.handley-derry@mcgill.ca

Decisions about Delivery Options for Women with One Previous Caesarean Delivery

Dear Participant,

St Mary's wants to learn about how women who have had a previous caesarean section decide how their next child will be delivered.

The results of this study will help us to better support expectant mothers in their decisions about having a second caesarean section.

Before you start, remember that:

- This questionnaire is done on a volunteer basis
- Whether you answer the questions or not will not affect the quality of your care
- Your name will not appear on the questionnaire
- There are no "right" or "wrong" answers. Please answer to the best of your knowledge

Thank you for your participation.

Study Number: ____________________________

Date: ____________________________

About your previous caesarean section:

1. What was the date of your previous caesarean section?  
(Month/Year) ____________________________

2. To the best of your knowledge, what was the reason for your previous caesarean section?

Check one option:

☐ I asked my doctor for a caesarean section
☐ I had to have an emergency caesarean section
☐ My doctor recommended that I have a caesarean section  
Reason: ____________________________

☐ Other: ____________________________

Tell us about yourself:

19. a) What country were you born in?  
☐ Canada
☐ Other: ____________________________

b) How many years have you lived in Canada?

☐ Less than 1 year
☐ 1 to 5 years
☐ 6 to 10 years
☐ 11 or more years

20. What is the principal language that you speak in your home?

☐ French
☐ English
☐ Other: ____________________________

21. What is the highest level of schooling you have completed?

☐ Part of primary school (elementary)
☐ Completed primary school (elementary)
☐ Part of secondary school (high school)
☐ Completed secondary school (high school)
☐ CEGEP or technical college
☐ University

Thank you for taking the time to complete our questionnaire, and congratulations on the birth of your baby!
There are many different reasons for having a second caesarean section. The list below includes examples from several women's experience:

18. Check the all responses that most closely match what was important to you:
   □ I had a previous caesarean section, and it was a positive experience
   □ I thought that having a caesarean section would be safer for my baby
   □ I did not want the birth to impact my sex life
   □ I wanted to be able to choose the exact day when my baby would be born
   □ I was afraid of giving birth vaginally
   □ I don't think that I would be able to successfully have my baby vaginally
   □ I felt that another caesarean was my only option
   □ I had a strong recommendation from my doctor to have a second caesarean section
   □ I had a strong recommendation from my partner/family/friends to have a second caesarean section
   □ Other (Please specify):

About discussions with your doctor:

4. Did you and your doctor discuss the option of having a vaginal birth?
   □ I don't remember
   □ No
   □ Yes
   [Go to question 7]

5. If yes, how much did the discussion with your doctor help you understand the risks of having a vaginal birth after your previous caesarean section?
   □ Not at all
   □ A little
   □ Moderately
   □ A lot
   □ I did not feel to discuss this with my doctor
   □ I did not discuss this with my doctor

6. How much did the discussion with your doctor help you understand the benefits of having a vaginal birth after your previous caesarean section?
   □ Not at all
   □ A little
   □ Moderately
   □ A lot
   □ I did not feel to discuss this with my doctor
   □ I did not discuss this with my doctor

16. When the decision to have a second caesarean was made, did you sign a form agreeing to have either (i) a repeat (second) caesarean section or (ii) trying a vaginal delivery?
   □ I don't remember
   □ No
   □ Yes

17. Please choose one sentence which best describes how the decision to have a second caesarean section was made:
   □ It was wholly my decision
   □ It was a decision I made after discussion with my doctor and spouse
   □ It was a decision I made after discussion with my doctor
   □ It was wholly the recommendation of my doctor
13. How much did the pamphlet help you understand the risks and the benefits of a second caesarean section?
- Not at all
- A little
- Moderately
- A lot
- I did not need a pamphlet

14. How much did the pamphlet help you in the choice to have a second caesarean section?
- Not at all
- A little
- Moderately
- A lot

15. Were you satisfied with the quality of the pamphlet you received?
- Not at all
- A little
- Moderately
- A lot

16. Thinking back, what sources of information did you use to help with this decision?
- Check all that apply
- Pre-natal discussion with my physician
- Discussions with my partner, family or friends
- Information pamphlet(s)
- Internet
- Books
- Media sources (magazines, newspapers, radio, television)
- Other
- I did not need to use any of these resources
- I did not use any of these resources

17. How much did the discussion with your doctor help you understand the benefits of having a second caesarean section?
- Not at all
- A little
- Moderately
- A lot
- I did not need to discuss this with my doctor
- I did not discuss this with my doctor

18. How much did the discussion with your doctor help you feel confident about the decision to have a second caesarean section?
- Not at all
- A little
- Moderately
- A lot
- I did not need to discuss this with my doctor
- I did not discuss this with my doctor

19. Pamphlets provided by the hospital and/or outsourcers are a useful source of information about childbirth and delivery.
- Check one option.
- I did not receive a pamphlet
- I received a pamphlet: "Vaginal Birth After Caesarean Section"

20. About the pamphlet:

21. How much did the pamphlet help you understand the risks and the benefits of having a vaginal birth after a caesarean section?
- Not at all
- A little
- Moderately
- A lot
- I did not need a pamphlet
INFORMED CONSENT FORM FOR PATIENTS

Decisions about Delivery Options for Women with One Previous Caesarean Delivery

Principal Investigator: Dr Balbina Russillo

Study Team: Jeannie Haggerty PhD, Marie-France Brizard R.N., Marie Jennifer Somera RN, Frances Handley-Derry

Study Sponsors: St Mary’s Research Centre Competition Attracting Research Excellence (CARE) Award

Location of Study: St Mary’s Hospital Centre

Purpose of the Study and Procedure

This study aims to explore how women with a previous caesarean delivery choose how their next child will be delivered, and what were the most important decision-making factors. As a mother who was booked to have a second caesarean section at St Mary’s Hospital, you are eligible for our study. The questions we will be asking will help us understand how you arrived at the decision about the mode of delivery of your next child.

For this study you will be asked to complete a self-administered questionnaire, which should take about 10-15 min and after that no further time commitment will be asked. Signing this consent form will also allow the investigators to look at select information from your medical chart for information related to the study. You should be aware that no identifying information will be used in any results published.

Benefits

While there is no direct benefit to your participation in this study, it may help St Mary’s to offer better care to future women.

Risks

There is a risk that answering the questions may make you feel uncomfortable. You have the right not to answer these questions, and to stop filling out the questionnaire at any time.

Confidentiality

Please be assured that all information provided for the study will be kept confidential. Electronic data will be kept secure and confidential by following standard procedure. Completed questionnaires and data forms will be labeled with code numbers and kept in a secure location at St Mary’s Hospital. Access will be given only to the
principal investigator, co-investigators and research assistant of the project. It should be noted that the Research Ethics Committee (REC) has a right to access patient medical records for purposes of monitoring. The data will be kept for 5 years, and then will be destroyed.

Participation in the study is strictly voluntary. A refusal to participate will not result in any penalty or loss of benefit. You have the right to discontinue participation in the study at any time with no penalty or loss of benefit.

**Copy of Consent Form**

If you undertake to participate in this study, you will be given a copy of your consent form.

**CONTACT INFORMATION**

Should you have any questions concerning the study, you may contact Dr Balbina Russillo at 514-910-9939 or Frances Handley-Derry (frances.handley-derry@mail.mcgill.ca).

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**Consent Statement**

I understand the risks and benefits associated with my participation in this study. I understand that the information collected during the study will be kept confidential.

I have had the opportunity to ask all my questions concerning the different aspects of the study and I have received satisfactory answers to my queries. I have had sufficient time to make my decision. I understand that I will be given a signed and dated copy of this consent form.

I agree to participate in this study entitled: “Decisions about Delivery Options for Women with One Previous Caesarean Delivery”

<table>
<thead>
<tr>
<th>Subject's signature</th>
<th>Name (Print)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature of person who administered informed consent</th>
<th>Name (Print)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approved by Research Ethics Committee
St. Mary's Hospital Center

April, 2012
Appendix 4:

Table 1 Cross tabulation of two dichotomous variables (effect size w=0.1, N=100)

<table>
<thead>
<tr>
<th>Value for variable 1</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value for variable 2</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>1</td>
<td>40</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 2 Cross tabulation of two dichotomous variables (effect size w=0.3, N=100)

<table>
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<tbody>
<tr>
<td>Value for variable 2</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>1</td>
<td>40</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 3 Cross tabulation of two dichotomous variables (effect size w=0.5, N=100)

<table>
<thead>
<tr>
<th>Value for variable 1</th>
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<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value for variable 2</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>1</td>
<td>40</td>
<td>15</td>
</tr>
</tbody>
</table>

Effect Size, Cohen's w

Power

N=150
N=100
N=50

Effect Size, Cohen's w

Power

0.0 0.2 0.4 0.6 0.8 1.0

0.0 0.2 0.4 0.6 0.8 1.0

0.1 0.2 0.3 0.4 0.5

0.1 0.2 0.3 0.4 0.5

0.1 0.2 0.3 0.4 0.5
## Appendix 5

### Confidence Interval Precision for Proportion Estimates of 0.1, 0.2, 0.4

<table>
<thead>
<tr>
<th>Proportion Estimate</th>
<th>N = 50</th>
<th>N = 100</th>
<th>N = 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>± 0.08</td>
<td>± 0.05</td>
<td>± 0.04</td>
</tr>
<tr>
<td>0.2</td>
<td>± 0.10</td>
<td>± 0.07</td>
<td>± 0.06</td>
</tr>
<tr>
<td>0.4</td>
<td>± 0.12</td>
<td>± 0.08</td>
<td>± 0.07</td>
</tr>
</tbody>
</table>
Appendix 6:

Total Frequencies of Reasons for a Repeat Caesarean Section in Descending Order of Endorsement

<table>
<thead>
<tr>
<th>Reason for repeat caesarean section from whole sample (n=146)</th>
<th>Frequency (Times chosen)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>I had a strong recommendation from my doctor to have a second caesarean section</td>
<td>40.4 % (59)</td>
<td>32.4-48.5%</td>
</tr>
<tr>
<td>I thought that having a caesarean section would be safer for my baby</td>
<td>34.9% (51)</td>
<td>27.1-42.8%</td>
</tr>
<tr>
<td>I had a previous caesarean section, and it was a positive experience</td>
<td>25.3 % (37)</td>
<td>18.2-32.5%</td>
</tr>
<tr>
<td>I didn’t think that I would be able to successfully have my baby vaginally</td>
<td>25.3 % (37)</td>
<td>18.2-32.5%</td>
</tr>
<tr>
<td>I was afraid of giving birth vaginally</td>
<td>18.5 % (27)</td>
<td>12.1-24.9 %</td>
</tr>
<tr>
<td>I had a strong recommendation from my partner/family/friends to have a second caesarean section</td>
<td>15.8 % (23)</td>
<td>9.8-21.7 %</td>
</tr>
<tr>
<td>Wanted VBAC</td>
<td>13 % (19)</td>
<td>7.5-18.5 %</td>
</tr>
<tr>
<td>I felt that another caesarean was my only option</td>
<td>8.9 % (13)</td>
<td>4.2-13.6 %</td>
</tr>
<tr>
<td>Negative 1st birth experience</td>
<td>6.2 % (9)</td>
<td>2.2-10.1 %</td>
</tr>
<tr>
<td>I wanted to be able to choose the exact day when my baby would be born</td>
<td>5.5 % (8)</td>
<td>1.7-9.2 %</td>
</tr>
<tr>
<td>Safety of the Mother</td>
<td>5.5 % (8)</td>
<td>1.7-9.2 %</td>
</tr>
<tr>
<td>Knew what to expect</td>
<td>3.4% (5)</td>
<td>0.44-6.4 %</td>
</tr>
<tr>
<td>Better for the family/taking care of other children</td>
<td>2.1% (3)</td>
<td>0-4.4%</td>
</tr>
<tr>
<td>Personal choice for CS/didn’t want VBAC</td>
<td>2.1 % (3)</td>
<td>0-4.4 %</td>
</tr>
<tr>
<td>I did not want the birth to impact my sex life</td>
<td>1.4 % (2)</td>
<td>0-3.3%</td>
</tr>
</tbody>
</table>