

# A Feminist Perspective On Listening To Women: Birth Stories Of Vaginal Birth Following Previous Cesarean Delivery

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A FEMINIST PERSPECTIVE ON LISTENING TO WOMEN:  
BIRTH STORIES OF VAGINAL BIRTH FOLLOWING  
PREVIOUS CESAREAN DELIVERY

by

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ABSTRACT  
A FEMINIST PERSPECTIVE ON LISTENING TO WOMEN:  
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PREVIOUS CESAREAN DELIVERY

Elizabeth Hill-Karbowska PhD (c), CNM

Marquette University, 2014

Women's perspectives of their experiences are important, and worthy of study. However, there have been no qualitative comparative investigations of vaginal birth after cesarean (VBAC) experiences of American women using their birth stories as data. Furthermore, there have been no studies where women's experiences of cesarean have been compared with their own subsequent VBAC.

The purpose of this study was to gain insight into the comparative experience of VBAC and cesarean, valuing women and their experiences through the use of a feminist research perspective. By contributing new and valuable insight into an area of research that has been identified as a "critical gap in the evidence" by the National Institutes of Health, the overall purpose of this study was to improve the health care of women.

A purposive sample of 13 women was obtained. Participants shared their stories of cesarean and VBAC during audiotaped interviews. Demographic information was obtained including indications for the prior cesarean, time since cesarean and VBAC, and the type of healthcare provider that attended their VBAC.

During data analysis, four themes emerged. These themes included perspectives on cesarean, informed decision making, perspectives on VBAC, and cesarean resolution. In addition, 21 subthemes were identified.

Participants described their cesarean as being unexpected/unwanted, often accompanied by feelings of failure and memory loss. The cesarean and recovery periods were accompanied by unexpected levels of intense pain, difficulty with breastfeeding, decreased mobility, and dependence on others. Women described their VBACs as universally positive experiences that were psychologically, emotionally, and/or physically beneficial. This positive impact was not limited to the time of the delivery and postpartum recovery, but was a healing experience that brought profound change to lives of the women.

By listening and learning from women, healthcare providers can become enlightened as to the significance of birth in the lives of women. This can serve as a catalyst for changing attitudes towards birth, empowering women to have positive birth experiences, whether vaginal or cesarean.

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Elizabeth Hill-Karbowski, PhD (c), CNM

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## Chapter 1 Introduction

In ancient cultures, cesarean birth was the mode of delivery for gods and heroes, an exceptional beginning for extraordinary beings (Boutsikou & Malamitsi-Puchner, 2011). It was rarely used, reserved for cases where the life of the mother or fetus was in jeopardy (Dauphinee, 2004; Raju, 2007; Sewell, 1998). However, as surgical and antiseptic techniques evolved over the last century, the rates of survival improved for both mother and neonate. As a result, the incidence of cesarean increased (Churchill, 1997). This increased incidence of cesarean section resulted in the clinical controversy of how a woman should deliver in subsequent pregnancies.

While it was documented that women were experiencing vaginal birth after cesarean (VBAC) (Eastman & Helman, 1961; Stander, 1941), it was not until 1981 that the National Institutes of Health supported offering a trial of labor after cesarean to women who had experienced a LTCS delivery (The Cesarean Birth Task Force, 1981). In 1988, the American College of Obstetricians and Gynecologists recommended the careful screening of women for a trial of labor. During the 1980's the safety of VBAC was widely studied. It gained acceptance as a method by which to reduce the overall cesarean rate, limit the surgical risk to the woman, and to give women the opportunity to experience nonsurgical delivery. As predicted, the acceptance of VBAC resulted in decreased cesarean rates (Menacker & Curtain, 2001).

By 1996, due in large part to the support of VBAC as a delivery method, the VBAC rate was 27%, and the overall cesarean rate was 21%. In 1997, a significant barrier to VBAC surfaced with the publication of the 4<sup>th</sup> Edition Guidelines for Perinatal Care (American Academy of Pediatrics and American College of Obstetricians and

Gynecologists, 1997). This standard setting document stated that it was the responsibility of any institution providing obstetric services to be able to begin an emergency cesarean within thirty minutes of a decision to do so. In 1999, the American College of Obstetrics and Gynecology (ACOG) published a position statement that VBAC only be attempted in institutions capable of responding to emergencies, with a physician capable of performing a cesarean immediately available. Again, many institutions were no longer able to comply with this recommendation, and the option of VBAC was not available at those institutions (Guise et al., 2004; Roberts, Duetchman, King, Fryer, & Myoshi, 2007). Furthermore, positing that there were dangers associated with decreasing the cesarean rate to 15%, a goal of Healthy People 2000, a trial of labor after cesarean (TOLAC) was deemed “inappropriate” if a facility was not able to perform an emergent cesarean delivery (Sachs, Kobelin, Castro, & Frigoletto, 1999).

After the publication of these and subsequent statements, there was a swift decline in the rate of VBAC and an increase in the cesarean rate. The cesarean rate increased every year until 2009, reaching an all-time high of 32.9% (Hamilton, Martin, & Ventura, 2011). During this time, the VBAC rate steadily dropped, reaching a reported rate of 8.4% for 2008 (Osterman, Martin, Mathews, & Hamilton, 2011).

A number of additional factors have contributed to the rising cesarean rate and decreasing rate of VBAC (Osterman et al., 2011). Whether serving as a barrier to VBAC or as a direct contributor to the rising cesarean rate, these factors include electronic fetal monitoring (Sachs, 2001; Spong, Berghella, Wenstrom, Mercer, & Saade, 2012), the liability environment (Yang, Mello, Subramanian, & Studdert, 2009), concerns regarding patient safety and facility resources (Guise et al., 2004; Roberts et al., 2007), a decline in



operative vaginal delivery rates (Maulik, 2004; Powell, Tilo, Foote, Gil, & Lavin, 2007; Spong et al., 2012), patient requested primary cesarean (Weaver, Staham, & Richards, 2007), rise in primary cesarean rates (Spong et al., 2012), changes in the childbearing population (Lowe, 2007; Zhang et al., 2010), induction of labor (Vahratian, Zhang, Troendle, Sciscione, & Hoffman, 2005), disciplinary and personal philosophies (Monari, Simona, Facchinetti, & Basevi, 2008), term breech management (Hannah et al., 2000), and patient education and information (Gregg, 1993; Kitzinger, 2005; Lucas, 2004).

The scientific literature contains numerous studies that demonstrate the risks of cesarean birth. The short term physical risks of cesarean, whether primary or repeat, include maternal hemorrhage (Landon, Hauth, Leveno, & Spong, 2004), damage to surrounding organs (Macones et al., 2005), deep vein thrombosis (Landon et al., 2004), infection (Landon et al., 2004), increased risk of respiratory distress in the newborn (Hook, Kiwi, Aminia, Fanaroff, & Hack, 1997), surgical injury to the baby (Alexander et al., 2006), separation of the mom and baby (Zanardo et al., 2010), and decreased breastfeeding rates (Zanardo et al., 2010).

While the focus of most studies has been on the short-term physical effects of cesarean, emerging research has identified long term sequelae (Silver, 2010). Uterine scarring may impact future pregnancies by increasing the risk of placental abnormalities, placental abruption, and stillbirth (Zelop & Heffner, 2004). Cesarean section can result in maternal chronic health issues including surgical adhesions, pain, and decreased rates of fertility (Loos, Sheltinga, Mulders, & Roumen, 2008; Silver, 2010). Women who have delivered by cesarean section have reported negative psychosocial effects including grief,

a sense of failure, a sense of a loss of control, and feeling betrayed by those that cared for them (Bainbridge, 2002; Soet, Brack & Dilorio, 2003).

Infants born by cesarean have been found to be at increased risk for developing chronic respiratory dysfunction (O'Shea, Klebanoff, & Signore, 2010; Tollanes, Moster, Daltveit, & Irgens, 2008), Type 1 diabetes (Bonifacio, Warncke, Winkler, Wallner, & Ziegler, 2011; Vehik & Dabelea, 2012), allergies (Boutsikou & Malamitsi-Puchner, 2011; Eggesbo, Botten, Stigum, Nafstad, & Magnus, 2003), and have had increased rates of hospitalization for asthma and gastroenteritis (Hakansson & Kallen, 2003).

The risks associated with a trial of labor after cesarean (TOLAC) have been extensively studied, and will be fully presented and analyzed in Chapter 2. The risk of uterine rupture has been of greatest concern, as reflected in the breadth of the study of this outcome. The rate of uterine rupture has recently been cited as .7-.9% with one prior cesarean, and .9-1.8% with two or more cesarean sections (ACOG, 2010a). While these rates are not significantly different from those of other obstetric emergencies including placental abruption and cord prolapse (Cunningham et al., 2012b), the fear of uterine rupture and its perinatal morbidities and mortalities has resulted in countless women being denied the opportunity to attempt VBAC.

While the concern about uterine rupture in the clinical and scientific literature deserves critique, the full analysis of the scientific VBAC literature is confounded by inconsistent definitions of uterine rupture and dehiscence, a predominance of retrospective designs, significant differences in inclusion and exclusion criteria, and historical variation in practices. As a result of the inconsistencies, ACOG VBAC guidelines, widely used to support obstetric practice and decision making, were revised 4

times within 12 years. These revisions led to changes in practice, increased concerns with risk management, and the resulting turmoil left many pregnant women and practitioners without the option to choose a trial of labor after cesarean (Scott, 2010).

In contrast, VBAC has been studied by numerous researchers focused on a number of aspects and outcomes including risks (Daltveit, Tollanes, Pihlstrom, & Irgens, 2008), benefits (Rossi & D'Addario, 2008), predictors of success (Durnwald & Mercer, 2004), outcomes (Avery, Carr, & Burkhardt, 2004; El-Sayed, Watkins, Fix, Druzin, Pullen, & Caughey, 2007), practice standards (ACNM, 2011; ACOG, 2010a), cost effectiveness (Macario, El-Sayed, & Druzin, 2004), patient education (Renner, Eden, Osterweil, Chan, & Guise, 2007), risk management (Yang et al., 2009), decision making (Shorten, Chamberlain, Shorten, & Kariminia, 2004), and maternal satisfaction (Cleary-Goldman, Cornelisse, Simpson, & Robinson, 2005).

Overall, the scientific literature to date supports the practice of VBAC. For those women who attempt a TOLAC, 60-80% will experience VBAC (ACOG, 2010a). VBAC has numerous benefits including the avoidance of operative complications, shorter hospitalizations, and overall better maternal and neonatal outcomes than elective repeat cesarean birth (Cleary-Goldman et al., 2005; Landon et al., 2004; Lydon-Rochelle et al., 2000; Lydon-Rochelle et al., 2010; Scott, 2011; Tan, Subramaniam, & Omar, 2007). Women who experience VBAC avoid the risks associated with additional uterine scarring that can impact future pregnancies (Smith, Pell, & Dobbie, 2003). In addition, women who have experienced VBAC report increased levels of satisfaction and feelings of empowerment (Phillips, McGrath, & Vaughan, 2010).

Despite the plethora of research regarding VBAC, there is one area of study that is conspicuously lacking in breadth and depth. The National Institutes of Health (NIH) has identified the area of “comparative long-term maternal and perinatal biological and psychological outcomes following VBAC” as a critical gap in the evidence (Cunningham et al., 2010a). Research studies involving women’s perceptions and experiences of VBAC are limited (Shorten & Shorten, 2012). This study aims to fill these gaps in the scientific VBAC literature.

Feminism is the guiding philosophy of this study, and its applicability to the research topic and method will be discussed at length in Chapter 2. In their classic work, Hall & Stevens (1991) outlined three shared principles among differing feminisms. These principles included recognizing the oppression of women, valuing women and validating their experiences, and seeking to bring about social change. These three principles and their relevance to the study will also be outlined in Chapter 2. Central to the feminist research perspective is a respect for the “uniqueness of the experience of each woman, and the desire to present these unique experiences in a way that gives power to those without equal power in our society” (Torkelson, 1996, p. 124). The methodology to support this perspective will be outlined in Chapter 3.

The need for research of birth stories has been identified as “dire”, as there is a need to empower women and families to reclaim their control over their childbirth experiences (Savage, 2001). There has been minimal research regarding birth stories, yet this research can lend insight into practice and facilitate policy change (Carolan, 2006; Harrod, 1998; Lee & Lamp, 2005; VandeVusse, 1999a; VandeVusse, 1999b).

## **Statement of the Problem**

Women's perspectives of their own experiences are important, and worthy of study. However, there have been very few qualitative investigations of VBAC, and American women's VBAC stories have not yet been used as data. To date, there have been no studies where women's experiences of cesarean were compared with their own subsequent successful VBAC.

## **Purpose of the Study**

The purpose of this study is threefold; 1) to value women and their cesarean and VBAC stories and experiences through the use of a feminist research perspective; 2) to gain insight into women's experience of both VBAC and cesarean, offering them an opportunity to compare and contrast them; 3) to contribute new and valuable insight into an area of research that has been identified as a "critical gap in the evidence" by the National Institutes of Health (Cunningham et al., 2010a).

The aim of this study is to improve healthcare for women who have experienced a prior cesarean birth by addressing this critical gap in the evidence. The words of women who have experienced a cesarean followed by a successful VBAC will serve to fill gaps in the literature to inform providers of health care, policy makers, and future healthcare consumers about the woman's perspective.

## **Significance of the Study**

The majority of research regarding VBAC has involved the physical aspect of birth, risks, and variables associated with its "success" or "failure". High value has been placed on preventing uterine rupture at the cost of promoting birth experiences that are

meaningful and positive (Shorten & Shorten, 2012). Research involving the psychosocial aspects of VBAC is minimal (Phillips et al., 2010). Only a few qualitative studies have focused on the experience of VBAC from the woman's perspective. Those that do exist explore the process of decision making, patient satisfaction, and the experience of VBAC. To date, there are no comparative studies of cesarean/VBAC stories of American women. Considering the current state of cesarean and VBAC rates in the USA, women's experiences may help contribute to a better understanding of the need for more women being offered the option of VBAC.

### **Significance to Nursing Practice**

In the United States, registered nurses (RN) fulfill many roles in the care of women during pregnancy and childbirth. RNs provide a substantial amount of bedside support to women during the peripartum period, and therefore can profoundly impact women's birth experiences (Hanson, VandeVusse, & Harrod, 2001; Harrod, 1998; Simkin, 1991; VandeVusse, 1999a; VandeVusse, 1999b). Nurses have become more autonomous in their practice, making key decisions about labor progress and comfort measures and also may manage labor based on standing orders and physician preference (Simpson, 2003).

Nursing knowledge regarding VBAC may be limited to information provided during orientation, experiential learning during care of women experiencing VBAC, reviewing institutional policies, or by reading journal articles. Nursing journal articles regarding VBAC are scarce. Since 1996, there have been only two articles published in the primary OB nursing journal, JOGNN, regarding VBAC. One article addressed the

safety of VBAC (Dauphinee, 2004), and the other explored what factors influenced women to choose VBAC (Ridley, Davis, Brigh, & Sinclair, 2002).

The significance of this study to nursing pertains to the generation of new and needed knowledge that can be used by maternity nurses in daily clinical practice to better meet the needs of women experiencing VBAC. This new nursing knowledge may also impact policy formation and clinical decisions that promote VBAC access within healthcare institutions and organizations.

### **Significance to Nurse-Midwifery Practice**

Certified Nurse Midwives (CNMs) and Certified Midwives (CMs) have long been advocates of women and their families. This advocacy includes (but is not limited to) access to healthcare, the right to informed consent, supporting self determination in making healthcare decisions, and care that is guided by the best evidence available (ACNM, 2012).

This philosophy is reflected in the ACNM Position Statement pertaining to vaginal birth after cesarean. The statement clearly states all women who have had a previous cesarean have “the right to safe and accessible options when giving birth in subsequent pregnancies” (ACNM, 2011). Informed consent should reflect evidence based research regarding risks and benefits of TOLAC and repeat cesarean section (RCS) (ACNM, 2011). Furthermore, facilities, administrators, and liability insurance carriers should not prohibit access to TOLAC (ACNM, 2011). As will be discussed in Chapter 2, women have not consistently experienced true informed consent, TOLAC is not available to all women with a history of a prior cesarean birth, and liability concerns have impacted practice.

The philosophy of the ACNM, and the professional support of the VBAC Position Statement, is reflected in the 2012 ACNM Benchmarking Project. This project includes data involving the work of over 1,100 CNM/CM FTEs, and outcomes of over 83,700 vaginal births. There were 4,557 TOLAC reported, with a success rate of 78.7% (ACNM, 2014).

This study will serve to add to the body of knowledge of CNMs/CMs regarding VBAC from the woman's perspective. In addition, this study will provide a resource for future research.

### **Significance to Nursing Education**

Nursing faculty seek to promote understanding and appreciation for cultural and personal differences in the perspectives of patient experiences (Lee & Lamp, 2005). One method that has been effective is the utilization of birth stories in nursing education (Lee & Lamp, 2005).

While VBAC is a clinical topic that is addressed in nursing programs, it may not necessarily be observed by nursing students. As discussed previously, VBAC rates have declined considerably over the last 15 years. Many women no longer have VBAC as an option, due to either institutional practice restrictions, or healthcare providers who cannot or will not offer VBAC as an option. This study would offer additional insight to nursing students regarding the experience of VBAC. This information may be useful in both expanding the opportunities for VBAC and improving patient care during TOLAC.



## **Significance to Nursing Research**

The significance to nursing research is twofold. First, as discussed previously, the study of VBAC from the woman's perspective is limited, and has been declared a critical gap in the evidence by the NIH. Second, in addition to providing new insight into VBAC, a feminist perspective is utilized in this study.

Ultimately, feminist beliefs and values should influence nursing practice, especially as nurses provide care for women during critical points in their development (Sampsel, 1990). Historically, nurses have been the product of a patriarchal culture, have not achieved the "status of occupational autonomy", and may not have recognized the influence of this on their practice (Ballou & Landreneau, 2010; Sampsel, 1990). This study will serve to enlighten and inform individuals as to how a patriarchal culture has impacted women and birth, and serve as a conduit for women to share their experiences of VBAC.

## **Definition of Terms**

**Vaginal Birth After Cesarean (VBAC):** Delivery through the birth canal in a pregnancy subsequent to one in which delivery was by cesarean section. (Merriam Webster Online Medical Dictionary, 2012).

**Trial of labor after cesarean (TOLAC):** An attempt to have a vaginal birth after cesarean delivery (ACOG, 2014)

**Repeat cesarean section (RCS):** Extraction of the fetus by abdominal hysterotomy anytime following a previous cesarean. (Definitions.net, 2014).

Low transverse cesarean section (LTCS): This surgery involves the transverse, or horizontal, incision of the lower uterine segment. Currently, it is the most commonly performed cesarean section (Cunningham et al., 2010b).

Low vertical cesarean section: This surgery involves a vertical incision into the lower uterine segment. This may also be known as a low-segment vertical cesarean section. This technique may be utilized for breech or transverse fetal presentations (Cunningham et al., 2010b).

Classical cesarean section: This surgery involves making a low vertical incision that extends high enough to allow for delivery. This technique may be utilized when there is a transverse lie, multiple gestation, maternal morbid obesity, invasive cervical cancer, adherent bladder, placenta previa, a need to deliver emergently, and/or extreme prematurity (Cunningham et al., 2010b).

“T” incision: This occurs when a low transverse incision is made and then the incision is vertically extended. This technique may be used when there is malpresentation of the fetus, an undeveloped lower uterine segment, or the presence of adhesions and/or fibroids that would restrict surgical access to the lower uterine segment (Patterson, O’Connell, & Baskett, 2002).

Uterine rupture: Uterine rupture is frequently defined as being complete, or incomplete. With a complete uterine rupture, all layers of the uterine wall are separated. With an incomplete uterine rupture, also known as a dehiscence, the uterine scar may be separated, but the serosa is still intact. It can occur in women without any prior uterine surgery, but occurs more frequently in women with prior uterine surgery. (Cunningham et al., 2010b; Landon, 2008).

Informed consent: Consent to surgery by a patient or to participation in a medical experiment by a subject after achieving an understanding of what is involved (Merriam Webster Online Medical Dictionary, 2012).

## Chapter 2 Review of the Literature

Vaginal birth after cesarean has long been a source of controversy. The movement to promote VBAC in the early 1980's was driven, in large part, by women's desire to experience vaginal birth. Therefore, the guiding philosophy of feminism and its relationship to the topic and the research method is presented. A comprehensive review of the literature is also presented in this chapter. The historical and scientific literature is presented and critiqued in order to provide insights into the controversy surrounding the current status of cesarean and VBAC. A review of pertinent birth story research is also presented to demonstrate the validity and reliability of women's narratives as data. Gaps in the literature will be identified to highlight the need for research that places women at the center of the process as essential sources of information.

The literature was searched utilizing search engines of CINAHL, Medline, Cochrane Database of Systematic Reviews, Psycinfo from Ovid, Ovid, Genderwatch from Proquest, Social Sciences in Proquest, and Health Sciences in Proquest. Search terms included: vaginal birth after cesarean (VBAC), trial of labor after cesarean (TOLAC), feminism, feminist, cesarean, narrative(s), story(ies), birth story (ies), and birth narrative (s).

### Philosophical Underpinnings

Philosophy may best be understood as being a "search for reflective understanding" of specific or general topics (BonJour, 2002, p. 1). Aristotle described philosophy as being knowledge of the truth, gained from study of physics, mathematics, poetics, rhetoric, and practical wisdom (Waugh & Ariew, 2008). It is concerned with

questions that may not be answered through direct investigation, or through traditional scientific testing. The knowledge that is gained through philosophical inquiry may not be a means to an end, but rather reveal a new area of further inquiry (Polifroni & Welch, 1999).

Epistemology, a branch of philosophy, encompasses knowledge, the ways in which it is generated, its requirements, and its limitations (BonJour, 2002). It seeks to reveal who can be a “knower”, what can be “known”, and what is “knowledge” (Campbell & Bunting, 1991). Empiricism was the initial form of epistemology, which emphasizes experience, evidence, and knowledge gained through sense experience (Baird & Kaufman, 2008).

It has been said that modern philosophical thinking begins with overturning traditional thought patterns (Baird & Kaufman, 2008). Historically, knowledge and truth were defined by using the dominant white male perspective as if it were the norm (The Personal Narrative Group, 1989). Feminist philosophy constitutes being in, and thinking of, the world in a way that challenges tradition (Sigsworth, 1995).

### **Feminism Defined**

Feminism is a philosophic tradition that reflects the diversity and constant evolution of women (Klima, 2001; Tong, 2009). As a result, there are multiple viewpoints, definitions, and beliefs. Numerous schools of feminist thinking exist including liberal, radical, Marxist, psychoanalytic, care-focused, multicultural, ecofeminism, postmodern, 1<sup>st</sup> wave, 2<sup>nd</sup> wave, and 3<sup>rd</sup> wave (Tong, 2009). Feminism has been likened to a large family in which there are disagreements in philosophy (Polifroni & Welch, 1999), yet all exist to serve and benefit the interests of women and the

victimized. This range of feminist philosophy is beneficial, as it reflects the diversity of life experiences and backgrounds of women.

Numerous definitions of feminism are in existence. It has been broadly defined as being concerned with issues surrounding sexual differences (Baird & Kaufman, 2008), gender equality and equal rights, and valuing individuals for their societal contribution rather than their biological roles (Allan, 1993). A classic work which will serve as a basis for this study posits that despite differences in definitions and philosophies, feminisms share three basic principles (Hall & Stevens, 1991). These principles include recognizing the oppression of women (through the existence of ideological, structural, and interpersonal conditions), valuing women and validating their experiences, and seeking to bring about social change. Each principle and its applicability to this study will be addressed in the following section.

### **The Applicability of Feminist Philosophy to this Study**

**Vulnerability: Recognizing oppression.** Gender based oppression exists in all aspects of women's lives (Klima, 2001). Within healthcare and related research, oppression has resulted in varying degrees of marginalization. Marginalization and vulnerability of women, resulting from oppression, will be discussed in this section. Oppression is defined as an “unjust or cruel exercise of authority or power”, or “a sense of being weighed down in body or mind” (Merriam-Webster, 2012). This has been demonstrated by the medicalization of pregnancy, the historical exclusion of women from research, manipulation by fear of poor perinatal outcomes, and lack of true informed consent.

Marginalization is the process by which those that are viewed as being “different”, or outside of the norm, are cast out of the social “center” to the periphery. It may involve oppression based on gender, race, economic status, politics, or culture (Hall, Stevens, & Meleis, 1994).

Based on gender alone, women are marginalized. However, marginalization can be an accumulation of layers involving socioeconomic status, education, race, age, or sexual orientation. In addition, holding beliefs that are different from the “hierarchical” center will also push individuals to the periphery. This marginalization can ultimately end in the creation of vulnerable populations; those that have an increased risk of poor health outcomes, or susceptibility to negative events (Flaskerud & Winslow, 1998; Vasas, 2005).

Vulnerability is a complex concept. It has been posited that it can be inborn or acquired (Zubin & Spring, 1977). Inborn vulnerability refers to that which is genetic, internal, and based on neurophysiology. Acquired vulnerability is a result of life events and experiences. For example, a woman based on gender alone, is vulnerable. By being pregnant, she is at risk for adverse health events, and is thereby adding another layer of vulnerability. She might have other acquired aspects of vulnerability preceding pregnancy involving age, socioeconomic status, race, family history, and education level (Bifulco et al., 2002). In the opinion of the researcher, vulnerability, with its associated oppression and marginalization, is compounded within the healthcare system through histories and cultures that devalue women.

Constructed patterns of thinking and knowledge in our culture have been largely shaped and directed by an authoritative, patriarchal male culture (Belenky, Clinchy,

Goldberger, & Narule, 1986). This culture has shaped the authors who recorded history, constructed theories, and developed educational models. Ultimately, the male experience has become the “normative value” against which the female experience has been judged (Allan, 1993; McCormick & Bunting, 2002). As a result, little attention has been given to the types of learning, knowing, and valuing that are common to women. This bias against women, which demonstrates further marginalization, has also permeated biomedical research and healthcare.

Historically, women have frequently been excluded from medical, psychological, and social research due to concerns that the menstrual cycle and pregnancy are confounders that can negatively and unpredictably impact results (Hall et al., 1994; McCormick & Bunting, 2002). As a result, their interests have gone largely overlooked, their experiences denied, and their voices made silent (Hall et al., 1994; McCormick & Bunting, 2002; Thorne & Varcoe, 1998). At the time of this writing, there are government agencies including the Agency for Healthcare Research and Quality (AHRQ), the U.S Food and Drug Administration (FDA), and the National Institutes of Health (NIH) that have specific divisions dedicated to women’s health research. However, women’s health research remains disproportionately quantitative, not reflective of the comprehensive experience, with significant gaps between qualitative findings and clinical practice (Abadir, Lang, Klein, & Abenhaim, 2014).

A culture that demonstrates a patriarchal collective approach that impacts women and their healthcare is that of medicine and medical practice. Patriarchy has flourished within medicine, and has resulted in the male appropriation and medicalization of childbirth (Cahill, 2000). Medicalization refers to the expansion of medicine into other



areas that have been previously non-medically defined problems (Gabe & Calnan, 1989). This process marginalized childbearing women as well as the women who attended them, devalued the intuitive and experiential knowledge of women, and increased their vulnerability to poor outcomes.

In the 1760s, the medicalization of childbirth began by physicians replacing female midwives in American birthing rooms (Leavitt, 1983). Seeking pain relief and increased safety during labor, and believing that formally educated physicians offered benefits that midwives could not, American women began inviting physicians into their homes. The practice of midwifery was devalued by physicians, as experiential knowledge was seen as less valuable than “formal” training. It should be noted that formal medical education was not established uniformly until the early 1900’s (Flexner Report, 1910). Female healers, including midwives, were persecuted by physicians, as they posed a threat to their authority and material prosperity (Ballou & Landreneau, 2010.) Opium for pain relief and forceps were seen as great developments in obstetrics, and lured by the false assurance of pain relief and safer passage for their infants, women transitioned from midwives to physicians (Leavitt, 1983).

As a result of medicalization and male appropriation of childbirth, women lost a significant amount of autonomy and control. This dominant male culture defined pregnancy as pathological (Cahill, 2001). Women, concerned about the “pathology” of pregnancy and birth, sought the safety that the hospital seemed to provide. This move from home to hospital did not guarantee women safety from infection, overdosing of anesthesia, or injuries from unskilled physicians (Leavitt, 1983). Male knowledge regarding childbirth was deemed “scientific”, and therefore superior to the more intuitive

knowledge that women had about their own bodies (Cahill, 2001), which impacted their ability to control their births.

Women relinquished control over some aspects of childbearing in their search for life and health, without fully realizing the risks involved in medical intervention (Leavitt, 1983). In 1887, it was noted in one study that cesarean section resulted in a 52.5% maternal mortality rate (Williams, 1904). Cesarean section was considered so dangerous that it was stated to be safer if the woman herself performed the surgery (Williams, 1904). By 1904, much improved rates of mortality were reported, and “only” less than 10% of women died as the result of cesarean section (Williams, 1904). For comparison, in 1900, the maternal mortality rate in the US was 900 per 100,000, or .9% (OBGYNhistory.com).

Reproduction, seen as powerful, frightening, and worthy of envy by men (Cahill, 2001), was also controlled by medicine. For example, it was not uncommon that if a woman was being delivered by cesarean section, permanent sterilization was advised. However, if the patient was intelligent, it was recommended that the decision should be left to her and her family. If she was deemed weak minded, diseased, or “liable to need repeat cesareans”, sterilization was considered justifiable (Williams, 1904). Sterilization was recommended after the third cesarean particularly for poor patients (Williams, 1924). By 1931, cesarean was advocated for those women deemed mentally or physically ill equipped to experience vaginal delivery (Williams, 1931). These recommendations, made in authoritative texts, guided and shaped the practice of numerous physicians who, in turn, impacted the reproductive “choices” of countless women.

Pregnancy and childbirth has been constructed by the dominant medical profession into a problematic event involving great risk (Baker, Choi, Henshaw, & Tree, 2005; Jordan & Murphy, 2009). This concept of risk has become unacceptable in Western society (Klein, 2006). In the opinion of the researcher, this aversion to risk is demonstrated in the decreasing rates of VBAC, the increasing rate of cesarean, and in the vast amount of literature surrounding the risks of attempting VBAC.

Many women are fearful of labor, vulnerable to suggestion, and will do anything necessary to ensure a good outcome for their baby (Sakala, 2006). They view themselves to be at a higher level of risk during pregnancy than they actually are (Darbyshire, Collins, McDonald, & Hiller, 2003). In order to avoid perceived risk, women often acquiesce to the assumption that technology and intervention is essential for a successful outcome, as they believe that it offers them control and increases safety (Davis-Floyd & Sargent, 1997). Risk is perceived to be further diminished by the assistance of professionals with expert skills and knowledge (Baker et al., 2005). However, women have placed their trust in medical practices that are not necessarily supported by scientific research (Leavitt, 1983). In addition, the trust that women may have in their physician is related to the normalization of medicalized birth (Campo, 2010).

Women may be manipulated into making decisions that may not be in their best interest, but that seem to be the most socially accepted option (Wittman-Price & Bhattacharya, 2008). If advised by a physician that a cesarean is in the best interest of their baby, most women will submit to the recommendation (Kitzinger, 2005). In order to be perceived as “obedient”, a “good mother”, and avoid potential hostility, patients may not question medical authority (Beckett, 2005; Churchill, 1997).

However, the medical authority will continue to demonstrate paternalism, not partnership, unless women and healthcare providers receive accurate education about VBAC (Shorten, 2010). Researchers have agreed that the risks associated with RCS have not been adequately presented in the literature, especially in comparison to the risks of VBAC (Vedam, 2010). Nurses have noted a lack of truly informed consent, as well as unnecessary cesarean sections (Sleutel, Schultz, & Wyble, 2007).

Women who might otherwise elect to attempt a VBAC may be dissuaded/oppressed by their health care providers, whose concerns regarding safety and their own professional liability alter the informed consent process. By not being told the truth, women are at an increased risk of undergoing unnecessary surgery, and of not being able to experience the full physical and psychosocial benefits of vaginal birth (Vedam, 2010).

**Vulnerability within the VBAC informed consent process.** The informed consent process for VBAC is not standardized, and may be vulnerable to distortion. Women make healthcare decisions based on incomplete and biased information regard risk and benefits (Beckett, 2005). The concept of choice, inherent in the informed consent process for VBAC or ERCS, may be coerced, or the woman might not question the “choices” offered to her (Gregg, 1993; Klein et al., 2006). Therefore, women do not received balanced, unbiased information from which to make an informed decision. Women may therefore experience increased social pressure to make decisions about VBAC based upon the possible impact on fetal health (with their own needs set aside), or face the challenges associated with exercising truly informed choice (Gregg, 1993; Klein et al., 2006).

Women may be manipulated into consenting, or refusing, certain treatments based on how the informational process is conducted, and the nature of what is shared. For example, when a woman is undergoing counseling regarding attempting a VBAC, the risk of uterine rupture should be clearly discussed (ACOG, 2010a). Using the same statistics, there are several ways to communicate her risk of uterine rupture. For example, the woman could be correctly informed that her overall risk of uterine rupture is 0.2%, that VBAC creates 1.9 additional uterine ruptures per 1000 cesarean births, or that her risk of uterine rupture is 37 times higher than a woman who has never had a cesarean. The last risk statement, though true, infers a much higher risk and could be used to manipulate her into making a decision that she might otherwise not have made (Jordan & Murphy, 2009). While in reality, a 0.2% risk of rupture is equivalent to a 1 in 500 chance. Clear and unbiased information about risk is an essential component of a truly informed consent.

The value that is placed on fetal life and well-being may overrule the mother's rights to self-determination (Cahill, 2001). Combine the philosophy of pathology surrounding pregnancy, the instilled fear regarding perceived risk, along with "fetocentrism", where the fetal "rights" are equal or greater than the mothers' (Baker et al, 2005), and women are at increasing risk of becoming passive partners in the birth process (Baker et al., 2005). As a result, the woman's autonomy and self-determination are diminished in the birthing process in her quest to provide a perceived safe passage for her baby. Ultimately, the result could be oppression (Baker et al., 2005), marginalization, and increased vulnerability of women who have experienced a prior cesarean.

**Valuing women and their experiences.** A feminist method of research recognizes the significance of using women's experiences as resources (Harding, 1987). When valuing women and their experiences through research, it is paramount to recognize that women are experts in their own lives (Callister, Vehvilainen-Julkenen, & Lauri, 2001). Society and scholars have been deprived of knowledge surrounding the lives and experiences of women (Mountford, 2003). Devaluing of women and their experiences, as discussed previously, has resulted in women being excluded from research. Researchers have often ignored women and their interests, and have extrapolated results found in men to women, without considering the biological differences between the two (McCormick & Bunting, 2002; Routledge, 2007; Thorne & Varcoe, 1998). As stated previously, since women have been compared to the male "norm", women have been viewed as defective, and reproduction as being inherently pathological and confounding to research (Cahill, 2001; McCormick & Bunting, 2002; Routledge, 2007). This perspective has impacted interactions that they have had within the healthcare environment, and diminishes their autonomy (Cahill, 2001).

Further, when women's views have been heard, or their history written, it has often been influenced by the dominant male culture (Mountford, 2003). The essence of female history has been neglected by silencing women's voices, which has been equated to oppression (Wittman-Price, 2004). Feminism strives to recognize and deconstruct oppression by hearing the voices of women.

Feminism seeks to examine the experiences of women through a framework designed from the standpoint of women (Klima, 2001). Authentic voices of women can be freed by sharing their experiences through narratives or stories, and this may result in

empowerment (Wittman-Price, 2004). Women are expert in regards to pregnancy and childbirth, and this makes their stories worthy of being heard (Parry, 2006).

By listening to a woman's story, one is lending credibility to her experience, validating her perspective, and she has an opportunity to process the experience in a new way (Callister, 2004; Farley & Widmann, 2000). The sharing of stories can provide a view into other cultures by revealing the sociocultural context of childbearing. This can assist in the provision of respectful and culturally competent care; further valuing women and their experiences (Callister & Vega, 1998; Callister et al., 2001; Yeo, Fetters, & Maeda, 2000).

Valuing women in research through the study of their birth stories can enlighten readers by giving them a view into the past, impact decisions made regarding the future, and can affect how individuals are socialized about birth (Sterk, Hay, Kehoe, Ratcliffe, & VandeVusse, 2002). In short, research regarding women's VBAC experiences could serve as a source of positive change in the care of women who have experienced a prior cesarean birth.

**Seeking social change-A change in the balance of power.** Feminism, utilizing qualitative research methods, women as subjects, and women's voices as resources, has become prominent in the study of women's health (Thorne & Varcoe, 1998). Feminism challenges the traditional patriarchal values, strives to dismantle the factors that proliferate the subjugation of women, and has become "an accepted tradition" in women's health research (Routledge, 2007, p. 285).

In pregnancy and birth, the expectations of the woman and the healthcare provider may significantly differ, with the balance of power favoring the provider (Churchill,

1997). A feminist perspective of birth alters the balance of power, as it focuses on women-centered care, and supports women remaining in control of their experience (Klima, 2001).

This change, or alteration in the balance of power, can be furthered through a process of emancipation in decision-making. Emancipation by definition is the antonym to oppression: to “free from restraint, control, or power of another- especially: to free from bondage; to release from paternal care and responsibility and make sui juris; to free from any controlling influence (as traditional mores or beliefs)” (Merriam Webster Online Dictionary, 2012). As a result of conceptual analysis, Wittman-Price (2004) defined emancipation as a “process of reaching a more positive state of being, a state of relative freedom in choice by first acknowledging an affective experience of oppression” (p.442).

**Emancipated decision making.** As previously discussed, the process of informed consent can result in women being manipulated or coerced into making a decision that they would have not otherwise made, based upon incomplete or biased information. This is an integral area for this research, as choosing to attempt a VBAC is the pivotal first step. The Wittman-Price Theory of Emancipated Decision Making in Women’s Healthcare (WPTEDMIWH) was reflected upon by this author while considering the principles of feminism. The WPTEDMIWH identifies attributes that must be present in order for “free choice” to occur. These include reflection, personal knowledge, empowerment, awareness of social norms, and flexible environment. Each of these attributes will be discussed in relationship to VBAC.



Reflection is a process, cognitive or interactive, in which women consider their alternatives in healthcare. In this study, reflection pertains to the process during which they consider their options of RCS vs. VBAC.

Personal knowledge is awareness by a woman that she has thought about the alternatives in relation to herself. For instance, when considering VBAC, she has thought about the risks and benefits of VBAC success, RCS after a failed trial of labor, or ERCS, and what each outcome would mean in the context of her life.

Empowerment, strongly associated with feminism, is reflected in this theory as being the information and resources that women are given by their healthcare providers regarding alternatives. In this instance, it could include the responses that a healthcare provider would give in regards to information that the woman found for herself. If a woman is given a breadth of balanced, unbiased information regarding her options, she is empowered to make a decision that is in her best interests. If the information is not provided, if it is biased, or if she does not even given the option of VBAC, she is not able to make an emancipated decision.

Awareness of social norms is defined as being aware that society places more value on one or more of the alternatives being provided. Emancipation involves a woman choosing what is best for her, even if it is not the socially popular decision. For example, VBAC may be viewed by some as being dangerous to the fetus. A woman may then be viewed as being selfish for putting her own needs and desires ahead of the perceived safety of her child, thereby not being a “good mother”.

A flexible environment is conducive to change, and is one that allows women to make an unopposed enactment of a chosen alternative. If there is any degree of

opposition or manipulation, oppression is present. A flexible environment would be exemplified in a facility that provides VBAC as an option, with staff that is supportive of a TOLAC. An example of an inflexible environment would be one in which VBAC would not be allowed to be attempted. Another example would be an environment in which VBAC was allowed, but the healthcare provider would not allow the TOLAC to go beyond an arbitrary duration.

The current informed consent process, which may be fraught with biased and inaccurate information, stands in stark comparison to women having an emancipated free choice to attempt VBAC. Free choice within healthcare decision making exemplifies the type of change sought by feminism is well presented in the WPTEDMIWH.

The applicability of feminist philosophy to this study, and the relevance of the change principle, is also reflected in the research method. The use of women's narratives has long been associated with a feminist method of research, and will be discussed in the following section.

### **Narrative/Story Research**

Methodology is discussed extensively Chapter 3. It will also be addressed here, as it pertains to a feminist method of research, and it is relevant to the research being proposed.

**Relevance of the method to this study.** Life itself is a narrative, as individuals organize their life experiences into meaningful stories (Berger, 1997). People are able to give their life chronological order, make sense of their lives by examining past events, and integrate transformative moments in their lives (Callister, 2004a). Sharing these life

events offers the opportunity to learn from each other, and promotes a sense of being connected to others (Sandelowski, 2004).

Narratives, or stories, are a rich resource, and should be used in research as their focus is on human lives and well-being (Bleakley, 2005; Carson & Fairbairn, 2002). They are used in research involving nearly every profession, as numerous disciplines work to discover the essence of the human experience (The Personal Narrative Group, 1989). Narratives can give insight into marginalized lives, illuminating the hard realities in life, leading the researcher to reflect, search for significance, and be transformed (Bleakley, 2005; Van Manen, 1990). This is particularly relevant in this study, as there is a gap in the VBAC evidence pertaining to the woman's perspective, and a need for greater understanding of the experience.

In healthcare research, narratives include biographical information, and can offer a more individualized and comprehensive view than a questionnaire (Bleakley, 2005; Overcash, 2004). Narratives reveal a patient's point of view, facilitate an empathetic reflection of experiences, and can serve as a bridge between science and humanity (Bleakley, 2005; Sandelowski, 2004). The narrative study assists in developing knowledge through examination of practice. This examination can further link education, research, practice, and assist in theory development (Carson & Fairbairn, 2002).

Birth story research contributes significantly to the literature and practice, as it informs health care providers as to patient perceptions, and offers insight into the physical, psychological, spiritual, cultural, and social aspects of birth (Carolan, 2006; Harrod, 1998; Souza, Cecatti, Parpinelli, Krupa, & Osis, 2009). This insight can positively improve the birth experiences of other women, and serve as a catalyst to

examine individual provider and institutional practices (Lee & Lamp, 2005; VandeVusse, 1999b). As discussed previously, the act of sharing a birth story can benefit a woman, as it offers her an opportunity to process her experience in a new way, assigning additional meaning to it, and integrating it into her life story (Farley & Widmann, 2001; Lee & Lamp, 2005).

Birth story research, typically performed through a qualitative method, provides reliable and valid data (Carolan, 2006). Women have been known to accurately recall details of their births for years, in fact, decades (Githens, Glass, Sloan, & Entman, 1993; Simkin, 1992). Feminist research uses women's experiences as resources, designing the research for women, focusing on new areas of inquiry (Harding, 1988). The forms of reliability and validity that provide rigor to conventional empiricist research cannot be applied to all feminist inquiry (Hall & Stevens, 1991).

Reliability often refers to the repeatability of a test or study. However, in feminist research, appreciating that each experience is not necessarily reproducible, reliability refers to the "dependability of the research processes" (Hall & Stevens, 1991, p.19). Hall and Stevens (1991) advise that examining the research methods and data analysis are ways of assessing the "dependability". Validity often refers to the tool of measurement that is utilized in research. Feminist research, concerned with a holistic view of a woman's experience, may be restricted by conventional tools, rather valuing the stories shared by women (Hall & Stevens, 1991). Central to feminist research is the belief that women are experts in their own lives, and can be trusted to tell the truth regarding their experiences.

Birth stories have been verbally shared between women for thousands of years, but rarely written or studied until recent times. Women are now documenting and sharing their birth experiences on the internet (Bylund, 2005). Heavily edited, dramatic television programs have shaped the public's perception of birth, all while promulgating fear of childbirth (Kitzinger & Kitzinger, 2001). Researchers have explored and revealed cross-cultural insights into childbearing by interviewing women, and then using the interview transcripts as data (Callister & Vega, 1998; Semenik, Callister, & Feldman, 2004; Yeo et al., 2000). Birth experiences ranging from low-risk to those involving high-risk pregnancies, severe maternal morbidity, and emergent cesarean birth have been examined by studying the interviews of those that experienced them (McCain & Deatrick, 1994; Ryding, Wijma, & Wijma, 1998; Souza et al., 2009). Aspects of childbirth involving security, control, and maternal decision making have also been studied using birth stories and narratives (Harrison, Kushner, Benzies, Rempel, & Kimak, 2003; Melender & Lauri, 2001; VandeVusse, 1999a; VandeVusse, 1999b).

As stated previously, the tenets of feminism encompass recognizing oppression, valuing women and their experiences, and bringing about social change (Hall & Stevens, 1991). Inherent in feminist theory and research is a valuing of the subjective, exemplified in the use of women's narratives, which present their lives and experiences (The Personal Narratives Group, 1989). Researchers, using women's experiences as data, designing research for women, and focusing on new subject matter, have revealed additional insights into childbearing. Women's experiences of childbirth have been explored from numerous and wide-ranging perspectives, but there is still much more work to be done. Studying women's comparative experiences of VBAC and cesarean, as shared through

their stories, utilizing a feminist perspective, will contribute additional knowledge regarding childbirth.

## **Literature Review of Cesarean and VBAC**

**History of Cesarean and VBAC.** Cesarean birth has been a part of obstetric history since ancient times, with the surgery being depicted in Greek mythology, as well as Western and non-Western art. It was thought that Julius Caesar was born by cesarean section, forever linking his name with the surgical procedure. However, his mother lived to learn of the invasion of Britain, which raises doubt that he was actually born by cesarean, because women were not known to survive this surgery until the 16<sup>th</sup> Century (Raju, 2007; Sachs, 2001). During the reign of Julius Caesar, Roman law decreed that women who died or were dying during childbirth should have the child surgically removed, to save the fetus and in order to increase the state population, setting a clear historical value of fetus over mother (Sewell, 1998).

Throughout the Middle Ages, cesarean birth was viewed as a last resort in order to save the life of the baby, or to satisfy religious edicts of the mother and child being buried separately (Raju, 2007; Sewell, 1998). Therefore, cesarean births were performed primarily perimortem. In 1500, a Swiss surgeon operated on his wife, and she is mentioned as the first woman to survive a cesarean (Sachs, 2001).

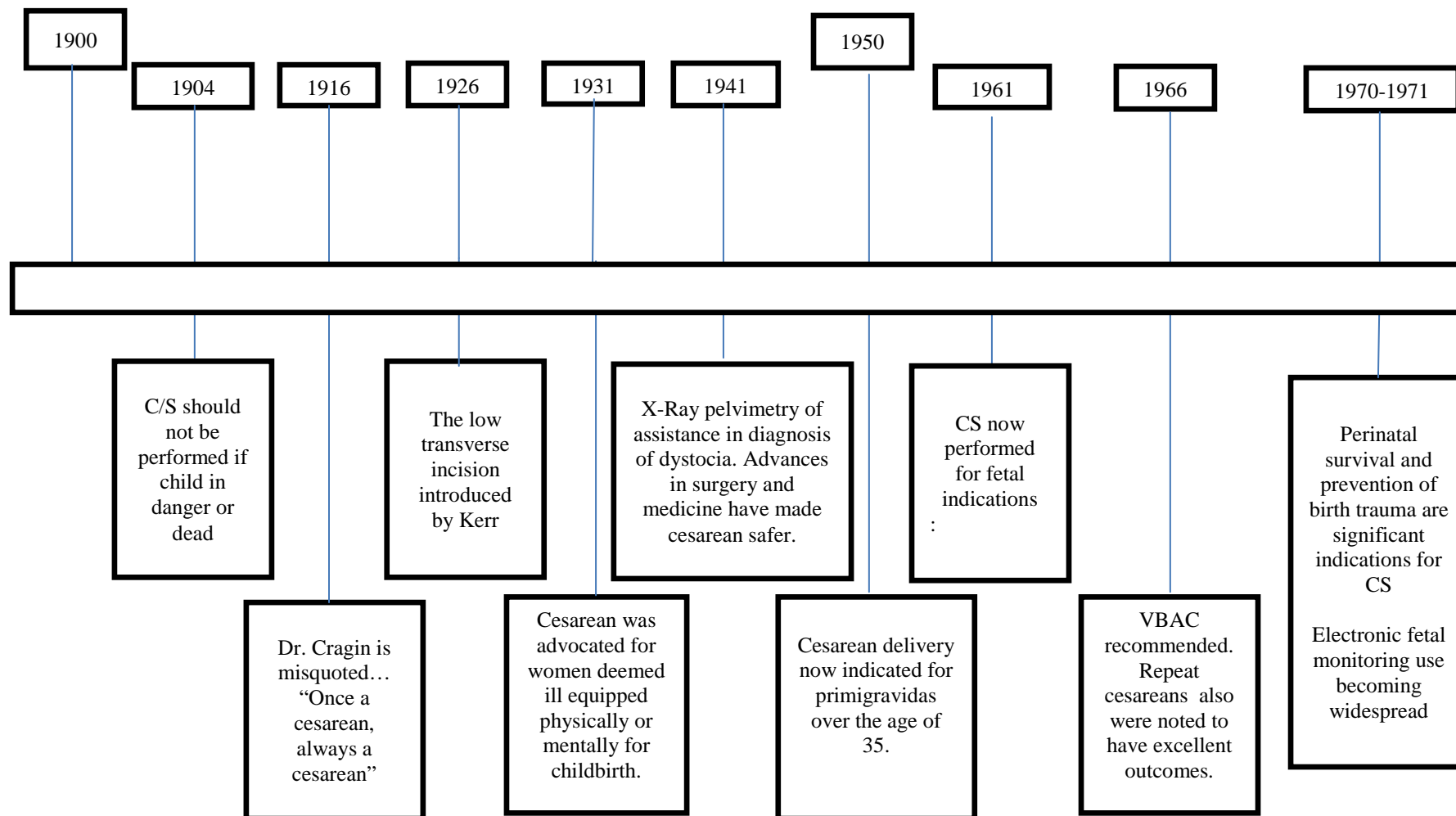
During the 19<sup>th</sup> century, it was first proposed that cesarean section could be used as an intervention for maternal complications (Dauphinee, 2004). Indications for performing a cesarean during the 19<sup>th</sup> century included suspected inadequate size of the maternal pelvis, fetal malpresentation, hernias of the uterus, or conception occurring outside of the uterus (Churchill, 1997). Achievements in antiseptics, anesthesia, and

uterine suture techniques resulted in improved maternal cesarean outcomes beginning during the latter half of the 19<sup>th</sup> century (Cohen & Atkins, 2001).

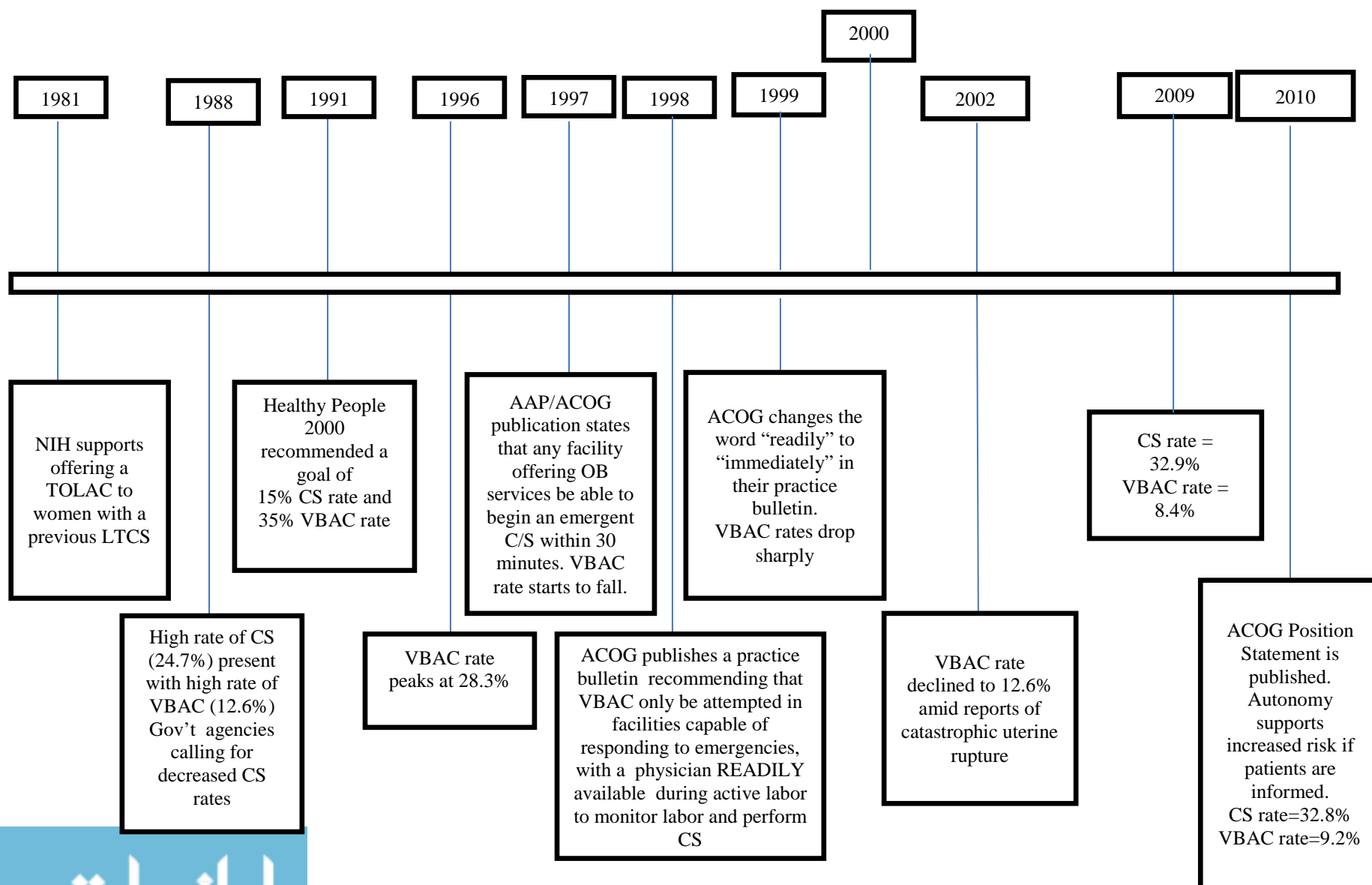
In 1904, “Obstetrics”, a widely used medical text, recommended that a cesarean should never be performed if the child was in serious danger or dead, or if the mother was infected or in poor condition. The overall cesarean rate was reported as being less than 1%, and the maternal mortality was reported as “only” less than 10% (Williams, 1904).

As cesarean section became survivable for both mother and fetus, the prevalence of the surgery increased. In turn, the increasing surgical experience for surgeons led to their increased competence, a wider range of acceptance for this delivery method, and increased incidence of cesarean section (Churchill, 1997). This increased incidence of cesarean brought a new controversy to light, and involved how women should deliver in subsequent pregnancies. Figure 1 outlines practice changes and guidelines that impacted cesarean and VBAC.

Figure 1  
VBAC/Cesarean Timeline  
1900-2010







On May 12, 1916, Edwin Cragin, MD stated the often-quoted, “once a cesarean, always a cesarean” (Cohen & Atkins, 2001; Harer, 2002). In this same discussion, he stated that there were many exceptions to this rule, and gave an example of one of his patients who had a cesarean section and subsequently had three vaginal births (Flamm, 1997). Dr. Cragin was sharing his concern regarding the primary cesarean rate, and was encouraging his colleagues to avoid them, as it would result in those women being subjected to numerous cesareans during the course of their lifetimes (Dauphinee, 2004). It should be noted that throughout much of the 20<sup>th</sup> century, the subsequent misuse of this incomplete quote served as a framework for the American practice of repeat cesareans without the option of vaginal birth after cesarean (VBAC).

In 1924, Williams stated “There seems to be a growing tendency to regard cesarean section as the simplest means of coping with most obstetric difficulties” (Williams, 1924, p. 496). Williams stated that he considered that it was being abused, and that he did not believe in “once a cesarean, always a cesarean”. He reported the uterine rupture rate was between 1-4%, and maternal mortality from cesarean was less than 1-2%. Statistics that were used in this and several subsequent editions of Williams Obstetrics were often results of studies done at larger institutions, and may not have reflected national rates, due to inadequate or yet undeveloped data collection techniques.

The low transverse uterine incision was introduced in 1926 by Kerr, who argued that the greater strength of the scar would permit safer labor in subsequent pregnancies (Cohen & Adkins, 2001). This incision also had a more immediate effect on decreasing the rate of maternal mortality from sepsis and hemorrhage. Antibiotics and safer blood transfusion practices became available after World War II. Perceptions of increased

safety of cesarean led to a broadening of indications that included not only labor dystocias, but also placenta previa and preeclampsia (Cohen & Adkins, 2001).

In 1931, the cesarean rate was approximately 1-2%, and the mortality rate was diminished to 1-2% (Williams, 1931). During this time, it was reported that in a study of 133 women who had a previous cesarean, 42 went on to deliver vaginally in a subsequent pregnancy (Williams, 1931). Cesarean was advocated at this time for women who were deemed ill –equipped physically or mentally for childbirth. Uterine rupture rates were between 1-4% (Stander, 1936).

The use of x-ray pelvimetry was described as being of great assistance in the diagnosis of dystocia (Stander, 1941). The cesarean rate remained at 1-2%, and the maternal mortality rate was reportedly decreased to .8%. A study of 217 women who had previously delivered by cesarean published in 1940, revealed that 119 (54.8%) went on to deliver vaginally in their next pregnancy (Stander, 1941).

Up to this point in the 20<sup>th</sup> century, advances had been made in medicine and in the safety of cesarean, making it markedly more likely for women to survive the surgery. Women were experiencing VBAC at appreciable rates in some institutions despite broadening indications for cesarean (Eastman, 1950).

By the time of publication of the 10<sup>th</sup> edition of Williams Obstetrics, the cesarean rate was 2% and the VBAC rate was 30% (Eastman, 1950). Cesarean delivery was indicated for elderly primigravidas, or those women over the age of 35. Maternal mortality was reported to be below 1% following cesarean. Uterine rupture was noted to occur less often in women with prior low cervical cesareans. The uterine rupture rate was reported as being 1% during the pregnancy, and 1% during labor. Continued advances in

surgical technique resulted in lower mortality rates, decreased rates of uterine rupture, increased indications for cesarean section, and a small, yet significant rise in the cesarean rate.

Indications for cesarean continued to evolve and expand. Eastman and Hellman (1961) stated that cesarean section for fetal indications required the most exacting judgment (Eastman & Hellman, 1961). The low segment cesarean section was recommended due to lower levels of blood loss, ease of repair, and decreased incidence of infection (Eastman & Hellman, 1961). As more cesareans were performed for fetal indications, surgeons became more skilled with their technique, and therefore more comfortable with this method of delivery. The result was a continuing rise in the cesarean rate.

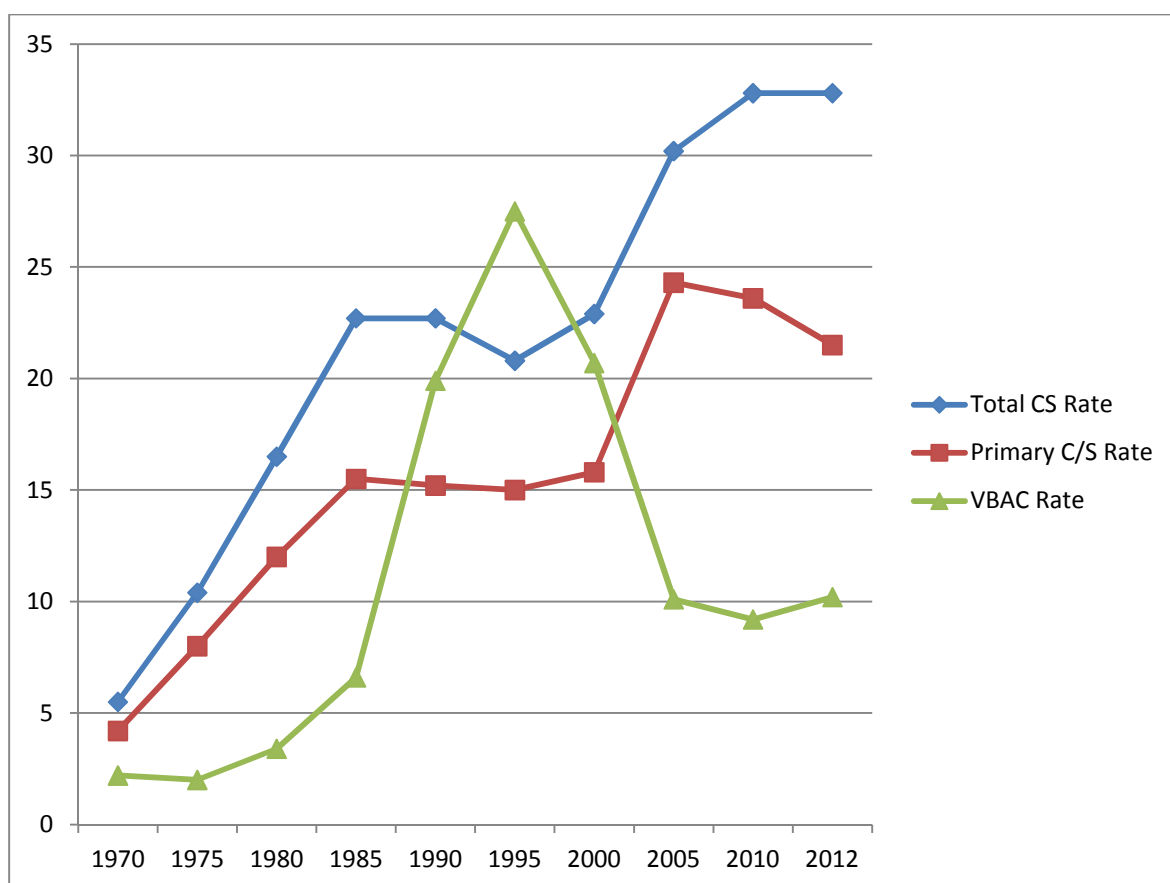
By 1966, the cesarean rate was reported to be 5% (Eastman & Hellman, 1966). A lower uterine segment scar was deemed more reliable for a future TOLAC. VBAC rates in some studies were reported to be 51% (Eastman & Hellman, 1966). The authors recommended that vaginal deliveries could follow cesareans. It was noted that women undergoing repeat cesarean sections also had favorable outcomes. They were reassured that abdominal delivery hazards had been reduced to the point that the shift in viewpoints surrounding the safety of cesarean was “commendable and understandable” (Eastman & Hellman, 1966, p. 1126). Ultimately, this would historically lead to further increases in the primary cesarean rate, and in the RCS rate.

Perinatal survival and prevention of birth trauma to the fetus became a significant indication for cesarean birth (Hellman & Pritchard, 1971). In 1970, prior to the introduction of electronic fetal monitoring, the overall cesarean rate in the United States

was 5.5%, with a primary cesarean rate of 4.2%, and 1.3% RCS rate. The VBAC rate for 1970 was 2.2% (ACOG, 2010a). Figure 2 outlines the total cesarean rate, primary cesarean rate, and VBAC rates for the US from 1970-2012.

Figure 2

*Total Cesarean Rate, Primary Cesarean Rate, and VBAC Rates for the US, 1970-2012*



From: ACOG Resource Center (2010b); Center for Disease Control and Prevention (2014).

Following the introduction of continuous electronic fetal monitoring, a higher rate of cesarean section was observed (Amato, 1977; Williams & Hawes, 1979). Besides fetal monitoring, the increased cesarean rate was thought to be due to changes in obstetric

practice, the addition of NICU care, the belief that a higher level of technology was correlated with more favorable perinatal outcomes, the delivery of breech fetuses by cesarean section, the diagnosis of labor dystocia, and RCS (Hughey, LaPata, McElin, & Lussky, 1977; Williams & Hawes, 1979). By 1980, the cesarean rate had increased to 16.5%, with 12.1% of those being primary cesarean sections, a RCS rate of 29.9%, and a VBAC rate of 3.4% (ACOG, 2010b).

In 1981, the National Institutes of Health supported offering a TOLAC in those women who had experienced a low transverse cesarean delivery (The Cesarean Birth Task Force, 1981). The American College of Obstetrics and Gynecology (1988) recommended that women attempting VBAC be carefully screened, and meet specific clinical criteria in order to be considered candidates for a TOLAC. A TOLAC is defined as the process by which a woman attempts to have a vaginal delivery. Criteria for attempting a TOLAC included; 1) fetus in the vertex presentation, 2) one or more low transverse uterine scars, 3) no known contraindications for vaginal delivery (Harer, 2002).

The promotion of VBAC was widely regarded as a turning point in obstetrics as an approach to decrease the overall cesarean rate, decrease maternal morbidity and mortality, lower escalating healthcare costs, and decrease recovery time (McMahon, 1998). The VBAC movement began to experience increased acceptance and success. A new era began, with more women requesting to attempt VBAC rather than routinely accepting RCS.

The safety and efficacy of VBAC was examined extensively during this time. The incidence of uterine rupture, and risk factors associated with a failed TOLAC were particular areas of research interest.

Stovall, Shaver, Solomon, and Anderson (1987) conducted a year long, prospective study of 272 women at one facility who elected a TOLAC after having a low transverse or low vertical cesarean section. Exclusion criteria included having a prior failed TOLAC, previous classical cesarean section, a previous low vertical incision in a preterm pregnancy (the uterine incision may have extended into the upper uterine segment), or a previous “T” incision (an incision that is transverse with a segment that extends vertically). Uterine dehiscence was defined as a defect that was palpable or visible in the existing uterine scar. If the defects did not require any surgical intervention, they were termed “windows”, and if they did require intervention, they were classified as uterine ruptures. All women attempting a TOLAC had intrauterine pressure catheters and internal fetal monitoring placed as soon as possible after admission. These interventions would require that amniotomy be performed before placement, possibly before the onset of active labor, which would then increase the likelihood of pitocin augmentation. There were 133 women that required oxytocin administration, and 139 that did not. Vaginal delivery was more likely in women who did not receive oxytocin (n=116, 85%), than in those that did receive oxytocin (n=98, 74%). In addition, all women had intrauterine examinations performed after vaginal delivery. There were no rates of chorioamnionitis or febrile episodes reported for subjects in this study. VBAC occurred in 216 women, which resulted in a success rate of 76.5%. One uterine rupture (.36%) occurred during the study, and there were 6 uterine “windows” (2.2%). Two of them were found by uterine

exploration following VBAC, and four were found at the time of the cesarean section. The authors did not provide demographic information regarding the sample, and did not specify the duration of rupture of membranes or the time of initiation of Pitocin augmentation. Although the study was further limited by a small sample, and active management of labor, which can increase the likelihood of additional interventions, the authors concluded that a TOLAC was safe for those women who had single or multiple cesareans with either a low transverse incision or a low vertical incision. In addition, they concluded that epidural anesthesia and oxytocin could be used safely in women attempting VBAC.

Flamm and colleagues (1988) conducted a multicenter prospective study of 57,533 deliveries that included 4929 (8.6%) women who had a previous cesarean section. Nine different hospital facilities were involved in this study that took place over the years of 1984-1985. Among 1776 women who elected a TOLAC, 1314 (74%) experienced a successful VBAC. In those 1776 trials of labor, there were 12 infants that had a five minute Apgar score of less than 6. Poor perinatal outcomes related to premature delivery (n=1), intrapartum fetal death (n=1) after a vacuum delivery for fetal distress, and antepartal fetal death (n=5) unrelated to a TOLAC were not excluded from this study. As a result, the overall perinatal outcomes reported included outcomes that were unrelated to attempting a TOLAC. The authors stated that opinions regarding offering a trial of labor among the centers included in the trial were varied, and in fact, the patient selection process may have been biased towards those more motivated to attempt VBAC. Most importantly, no maternal or fetal perinatal mortality was experienced as a result of uterine scar rupture. As a result of the study, the researchers concluded that 1314 cesarean births



were avoided during the time of the study, and that a trial of labor was a safe alternative to an ERCS.

VBAC was becoming increasingly accepted in the 1980's, and by 1988 the rate of VBAC rose to a new high of 12.6% (ACOG, 2010a). However, this rate of VBAC was still accompanied by a record high cesarean rate of 24.7%. It was posited that if all eligible women were allowed to deliver by VBAC, over 200,000 cesareans could be avoided each year (Flamm, Newman, Thomas, Fallon, & Yoshida, 1990). Therefore government agencies were applying pressure to reduce the cesarean rate and encourage VBAC (Wing & Paul, 1999).

A meta-analysis was conducted that included 31 studies and 11, 417 trials of labor evaluating maternal/fetal morbidity and mortality based on delivery route after a cesarean (Rosen, Dickenson, & Westhoff, 1991). The purpose of the study was to determine if TOLAC was as safe as ERCS. The study specifically excluded antepartal fetal deaths, congenital anomalies that were incompatible with life, and those with a fetal weight less than 750 grams. After these exclusions, there was no difference in the perinatal death rates between VBAC and elective cesarean births. Selection criteria included publications between 1982-1989, research conducted in the US, VBAC eligibility met, description of comparison groups, and data that was detailed enough to determine actual number of cases in each group. However, the studies varied in that some included women who had experienced classical or low vertical cesareans, which make them more vulnerable to uterine dehiscence and/or uterine rupture. Many studies did not define the differences between uterine dehiscence and uterine rupture. For the purpose of the meta-analysis, the authors grouped dehiscence and rupture together, which resulted in a falsely elevated

indication of risk. While these are recognized limitations to this meta-analysis, they are reflective of discrepancies and controversy surrounding VBAC, which persist to the time of this writing. The authors concluded that VBAC is a “safe component of obstetric care” (p.469), and that there are no major risks associated with a failed TOLAC that is followed by cesarean section. In addition, the authors discussed the limited number of studies regarding the emotional and psychological issues surrounding trials of labor, and recommended that this should be an area of future study. They proposed a new dictum in regards to cesarean: “Once a cesarean, a trial of labor should precede a second cesarean, except in the most unusual circumstances” (p. 469).

In 1991, the U.S. Department of Health and Human Services issued *Healthy People 2000*, a landmark document that recommended the goal of a 15% cesarean rate, and subsequently increasing the rate of VBAC to 35%. At the time of the publication, the rate of cesarean section had dropped to 22.6%, and the VBAC rate had risen to 21.3%.

A prospective multicenter comparison of women who elected either a TOLAC or a RCS was undertaken (Flamm, Goings, Liu, & Wolde-Tsadik, 1994). A trained research associate coordinated the participation of 10 Kaiser Permanente hospitals, and supervised data collection and entry. Exclusion criteria included a known history of prior classical or low vertical uterine incision. Of the 7229 study subjects included in the study, 75% elected to undergo a TOLAC (5022), and 2207 underwent RCS. VBAC was successful in 75% of the patients who elected a TOLAC (3746). Women who chose an ERCS were more likely to be older, have more prior cesarean sections, have fewer VBACs, have an unknown scar type, and have experienced fewer prior vaginal deliveries. There was also a wide range of TOLAC rates (59-84%) at the participating facilities. Uterine rupture was

defined as any defect involving the entire uterine wall, which may or may not have been symptomatic, requiring surgical intervention. Utilizing this liberal definition of uterine rupture may have played a role in the increased rate (.8%) observed in the study. No perinatal deaths resulted from uterine rupture. Those that elected to have a RCS experienced longer hospital stays (84.9 vs. 57.2 hours), had a higher incidence of blood transfusion (1.72 vs. .72%), and fever (16.4 vs. 12.7%). Those that had a TOLAC were more likely to have infant with a 5 minute Apgar score of less than 7 (1.48% vs. .68%), though it was deemed to be of no clinical relevance. The authors concluded that neither delivery method was without risk, but that a closely supervised TOLAC could eliminate the need for many RCS. This prospective cohort study, despite its limitations, demonstrated that VBAC was safe, often successful, and could decrease the rate of cesarean sections.

In order to observe and report the changing incidences of cesarean section and VBAC, a 10 year (1983-1992) retrospective study of delivery data was performed utilizing the records of 164,815 women from two participating hospitals (Miller, Diaz, & Paul, 1994). Of those births, 10.5% (17, 322) were to women with at least one prior cesarean section. Exclusion criteria included a known history of a classical uterine incision, previous uterine rupture, obstetric contraindications to labor (not including breech presentation or twin gestation), and unrepaired uterine dehiscence. For the purpose of this study, uterine dehiscence was defined as a uterine scar separation that did not require surgical repair. Uterine rupture involved the entire thickness of the uterine wall. In addition to involving the entire thickness of the uterine wall, a uterine rupture had to include laparotomy for hemorrhage control, hysterectomy or repair of the uterus or

bladder, extrusion of any part of the placenta, cord or fetus through the defect, or acute fetal distress. Of the 17,322 women who had experienced a previous cesarean, 193 (1.1%) of them experienced uterine dehiscence, and 117 (.67%) of them experienced uterine rupture. Women undergoing a TOLAC were more likely to experience uterine rupture (n=95, .7%), but women electing a RCS also experienced uterine rupture (n=22, .5%). Uterine rupture was more likely in women with two or more cesareans (1.7%) as compared to those women who had only one (.6%). There were 12,707 women who underwent a TOLAC, and 82% (10,439) of them experienced VBAC. Overall, the average 10 year VBAC success rates at these two facilities were 83% with one prior cesarean, 75% with two prior cesareans, and 79% with three or more prior cesareans. There were 8 rupture related perinatal deaths during the study period, with only 3 of those occurring during a TOLAC. While the study is limited by its retrospective design and reliance on information documented in medical records, it was concluded that a TOLAC is appropriate for the majority of women who have had previous cesareans. Furthermore, in instances where the uterine scar type is unknown, the authors concluded that it was acceptable to offer a TOLAC.

From 1991 to 1996, while the VBAC rate was rising, the cesarean rate declined from 22.6% to 20.7% (Menacker & Curtin, 2001). In 1996, the VBAC rate peaked at 28.3%. (ACOG, 2010a).

In 1997, another barrier to VBAC surfaced with the publication of the 4<sup>th</sup> Edition of Guidelines for Perinatal Care (American Academy of Pediatrics & American College of Obstetricians and Gynecologists, 1997). In this edition, it was stated that it was a basic responsibility of any institution providing obstetric services to be able to begin an

emergency cesarean within 30 minutes of a decision to do so. Nicknamed the “30 minute rule” by many, it posed a barrier to many institutions being able to offer VBAC, particularly if all necessary staff were not in house when VBACs were being attempted. As a result, the option of VBAC was not made available to many women.

In 1998, ACOG published a position statement regarding VBAC, which will be discussed in greater detail in a following section. Based primarily on consensus and expert opinion, it was recommended that VBAC only be attempted in institutions capable of responding to emergencies, with available personnel and anesthesia for emergencies, with a physician readily available throughout active labor that could monitor labor and perform a cesarean delivery (ACOG, 1998). Eight months later, another ACOG VBAC practice bulletin was published in which the word “readily” was replaced with the word “immediately” (ACOG, 1999). A number of smaller level 1 and 2 hospitals and birth centers could not comply with this recommendation, therefore VBAC was no longer offered as an option to many women. This directly contributed to both the lower VBAC rate, and the increase in the cesarean rate since 1998.

The VBAC rate declined to 12.6% in 2002 (ACOG, 2010a), amid reports of catastrophic uterine rupture, and ever-increasing malpractice settlements (Greene, 2004). As of final data for 2009, the rate of cesarean section was 32.9%, with the VBAC rate at 8.4%.

In 2010, ACOG published a new VBAC practice bulletin that contained statements that a TOLAC be attempted in institutions that are capable of performing emergency cesarean deliveries, with staff immediately available to provide that emergency care as before. However, the bulletin added that if these resources are not

available, the patient and health care providers should discuss the hospital resources, as autonomy supports patients accepting increased levels of risk if they are clearly informed of it (ACOG, 2010a).

The cesarean rate for 2012 was 32.8%, which is the rate that it has been since 2010 (Center for Disease Control and Prevention, 2014). The VBAC rate for 2012 showed an increase to 10.2% (Center for Disease Control and Prevention, 2014). It is too early to determine what long-term impact this latest ACOG bulletin will have on the VBAC rate, but it may remove some barriers that are encountered by facilities that were unable to comply with the recommendation of “immediately available”.

At the time of this writing, ACOG just published a consensus statement regarding safe prevention of the primary cesarean delivery due to concerns that cesarean is being overused (ACOG, 2014a). There are recommendations that the definition of labor dystocia may need to be revisited, as it appears that “contemporary labor progresses at a rate substantially slower than what was historically taught” (ACOG, 2014a, p. 693).

### **Factors Involved in the Rise of Cesarean and Fall of VBAC Rates**

There are numerous factors that have resulted in the significant rise in the rate of cesarean (Sachs, 2001; Spong et al., 2012). In this section, causative factors for the rise in the cesarean rate and the fall of the rate of VBAC will be explored. Those that have been identified include electronic fetal monitoring (EFM), the liability environment, concerns regarding patient safety, decreased rates of operative vaginal delivery, cesarean on maternal request, induction of labor, selection of VBAC candidates, provider attitudes towards VBAC, and patient education. Each factor will be discussed separately in the following section, emphasizing the impact that each factor has had on the rates of

cesarean and VBAC. In many instances, not only has the individual factor been implicated in increasing the cesarean rate, it has also been identified as a direct barrier to VBAC. As previously stated, the VBAC success rate has been reported as 60-80% (ACOG, 2010a). The VBAC success rates in the following literature review ranged from 52.2-85.2%. Table 1 outlines the research reviewed in this section.

Table 1

*Factors Involved in the Rise of Cesarean and the Fall of VBAC Rates*

| 1 <sup>st</sup> Author and Year | Factor                                     | Design   | Purpose of the Study  | Total<br><i>n</i>   | Findings   |
|---------------------------------|--|--|---|---|--|
| Seyb (1999)                     | Induction of labor                         | Retrospective  | Quantify risk of cesarean in nulliparous women at term  | 1,561 total<br>1,124 spontaneous<br>143 elective IOL<br>294 medically indicated IOL | Elective induction of labor associated with a significant increased risk of CS in nulliparous women.   |
| Yeast (1999)                    | Induction of labor                         | Retrospective  | Examine increasing rates of induction of labor and effect on CS rates   | 18,055 singleton pregnancies  | The risk of cesarean doubled for nulliparous women who were induced vs. those that spontaneously labored.  |
| Hannah (2000)                   | Term breech management                     | Randomized to planned cesarean or planned vaginal delivery | To determine if planned cesarean resulted in more favorable outcomes than planned vaginal births for fetuses in breech position | 1,041 planned CS<br>1,042 planned vaginal birth                                     | Planned cesarean delivery was found to be associated with a lower incidence of perinatal mortality, neonatal mortality, and serious neonatal morbidity than vaginal delivery (1.6% vs. 5.0%, $p<0.0001$ ). |
| Gamble (2001)                   | Patient requested cesarean                 | Prospective  | Examine birth preferences of women, and factors related to their preference   | 310 women   | Women who preferred CS were more likely to be multiparous, to have had disappointing deliveries, and to have anxiety about labor.  |
| Spong, 2012                     | Primary cesarean                           | Findings of workshop                                       | Synthesis of information related to the primary cesarean delivery, exploring a compilation of medical and nonmedical factors    | N/A   | Recommendations are given regarding the examination of current practices.  |
| Kaiser (2001)                   | Changes in childbearing population-Obesity | Retrospective  | Examine cesarean rates between obese and non-obese women  | 1881 women  | Obese women had increased CS rates (7.7% vs. 4.1%)   |
| Weiss (2004)                    | Changes in childbearing population-Obesity | Secondary analysis of prospective database study           | Determine whether obesity is associated with pregnancy complications and primary cesarean                                       | 16, 102 total<br>BMI <30= 13, 752<br>BMI of 30-34.9=1,473<br>BMI >35=877            | Overall CS rate=22.7%<br>Cs rates by BMI:<br><30=20.7%<br>30-34.9=33.8%<br>>35=47.4  |



|                  |  |   |  |  |  |
|------------------|--|---|--|--|--|
| Vahratian (2005) | Induction of labor                         | Retrospective   | Analysis of delivery data on low risk nulliparous women undergoing elective induction    | 2,200 total<br>1,771 spontaneous<br>286 with oxytocin<br>143 with cervical ripening              | Progression differs between induced and spontaneous labor. Elective induction with unfavorable cervix necessitating cervical ripening associated with 3.5 times greater risk of CS than spontaneous labor. |
| Menacker (2006)  | Decline in operative vaginal delivery      | Retrospective   | Examination of delivery trends   | 4,000,000 births per year  | In 2004, the rate of operative delivery was 6.2%, and dropped to 4.8% in 2005.   |
| Battista (2007)  | Induction of labor                         | Retrospective   | Examination of labor complications of multiparous women who underwent induction of labor | 9,637 total<br>7,208 spontaneous<br>2,190 induced/Pitocin<br>239 induced after cervical ripening | When compared with spontaneous labor, oxytocin induction associated with 37% increase in CS. If cervical ripening was necessary, cesarean risk tripled.  |
| Roberts (2007)   | Patient safety and facility resources      | Retrospective   | Assess the impact of an ACOG recommendation on the availability of VBAC                  | 312 hospitals responded, with 230 of them offering intrapartum care                              | 68 of responding delivering hospitals had stopped offering VBAC.   |
| Monari (2008)    | Disciplinary and personal philosophies     | Face-to-face interviews and 35 item questionnaire         | Explore the attitudes of physicians and midwives regarding cesarean                      | 248 participated<br>148 midwives<br>100 obstetricians  | Midwives were more likely than physicians to believe the cesarean rate was too high (65% vs. 34%), and less likely to offer repeat cesarean.   |
| Yang (2009)      | Liability environment                      | Retrospective-longitudinal mixed effects regression model | Examine the effects of malpractice pressure on cesarean and VBAC rates.                  | 52,000,000 births examined on a state by state basis   | In states with increased malpractice pressure, there were increased rates of cs and decreased rates of VBAC  |
| Zhang (2010)     | Changes in childbearing population-Obesity | Retrospective observational study                         | Collection of comprehensive information regarding current obstetric practice             | 228, 668   | Obesity associated with increased risk of primary and repeat CS. See Table 2   |

**Electronic fetal monitoring.** Electronic fetal monitoring (EFM) has been implicated as a cause for the increased rate of cesarean section, with high interobserver and intraobserver variability in its interpretation, and a high false positive rate of fetal intolerance of labor (Amato, 1977; Miller & Depp, 2008; Sachs, 2001; Spong et al., 2012). This high false positive rate of fetal intolerance of labor has resulted in unnecessary cesarean sections, and of premature abandonment of VBAC attempts. Interrater variability has resulted in wide practice variations between practitioners (Parer & King, 2000). To decrease the variability of interpretation, and increase effective communication between healthcare team members, the NICHD (2008) has published revised fetal monitoring practice guidelines in order to standardize healthcare provider communication. ACOG (2010d) published a practice bulletin with recommendations related to the management of intrapartum fetal heart tracings. The impact of these most recent guidelines on cesarean and VBAC rates has yet to be studied.

**Liability environment.** The liability environment influences delivery choices (Perl, 2010; Sachs, 2001; Yang et al., 2009), and lowers the tolerance of risk taking. The ACOG Survey on Professional Liability for 2012 surveyed 32,238 Fellows and Junior Fellows. There were 9,006 completed surveys, corresponding to a 27.9% return rate. The results revealed that 23.8% reported increasing the number of cesareans they performed, 18.9% stopped offering VBAC, and 6.2% stopped offering obstetric services in response to litigation concerns (Klagholz & Strunk, 2012).

To further estimate the effects of malpractice pressure on the cesarean and VBAC rates, Yang and colleagues examined birth certificate data from the Natality Detail File from 52 million births in the United States (1991-2003) using state-level longitudinal

mixed-effects regression models. Malpractice pressure was measured state by state using malpractice insurance premiums and tort reforms as was delivery method. Control variables included those related to providers, patients' medical risk factors, and socioeconomic factors. Nationally, a statistically significant relationship was found between the rising malpractice pressure and increased prevalence of cesarean section ( $p=.02$ ), increased prevalence of primary cesarean section ( $p=.02$ ), and the decreased incidence of VBAC ( $p=.01$ ). Those states with higher malpractice premiums had higher rates of cesarean delivery and lower rates of VBAC than did states with lower malpractice premiums. The presence of state tort reforms (damages caps and pretrial screening) was associated with higher VBAC rates and lower cesarean rates. Despite the retrospective nature of the study, the findings support that reducing the litigation pressure would likely lead to a decreased incidence of cesarean section, and increase the incidence of VBAC.

**Patient safety and facility resources.** Concerns regarding patient safety are closely associated with obstetric liability. While there are risks inherent in VBAC, risk is also inherent in RCS. However, policy debate and patient safety concerns have focused intensely on the slight increased risk of fetal death due to the rare event of uterine rupture during the TOLAC (Roberts et al., 2007). However, well-prepared hospital staff caring for women attempting VBAC can respond quickly to signs of uterine rupture, mitigating this risk (Socol, 2003).

The aforementioned 1998 ACOG practice statement, recommending that VBAC only be attempted in institutions where an immediate cesarean could be performed had far reaching consequences for the availability of TOL. This recommendation was based

primarily upon consensus and expert opinion, not consistent scientific evidence. The word “immediate” constituted a significant barrier for VBAC in many facilities, particularly those in rural areas. In some instances, this also has been interpreted to mean that an obstetrician, anesthesiologist, surgeon, and other personnel necessary for a cesarean should be immediately available in the hospital during the patient’s labor (Wall et al., 2005). As many health care institutions in the United States did not have the capability to comply with this recommendation, the opportunity for women to experience VBAC decreased (Guise et al., 2004).

To assess the impact of the ACOG recommendation on the availability of VBAC, Roberts and colleagues (2007) undertook a study of all of the hospitals in Colorado, Montana, Oregon, and Wisconsin for the years 2003-2005. These states were selected as they demonstrated a mix of urban and rural hospitals, and were also with and without a liability insurance crisis. Of 314 hospitals that were contacted, 312 agreed to have a representative participate in a semi-structured interview, with 230 hospitals involved in intrapartum care. Nearly one third (68) of these delivering respondent hospitals had stopped doing VBACs, while 7 had never allowed them. VBAC policies had been revised since 1999 in 68% of these facilities. The most frequent policy changes involved requiring in house surgery (53%) and anesthesia (44%), which presents significant barriers to facilities. Those facilities that stopped offering VBAC were smaller (58.1 vs. 156.6 beds), more isolated from other delivering hospitals (36.2 vs. 20.9 miles), had fewer deliveries per year (458.3 vs. 1009.9), and did fewer cesarean deliveries per year (105.7 vs. 226.7). As a result of these policy changes and practice restrictions, women were unable to attempt VBAC, and underwent unnecessary cesarean sections..

**Decline in operative vaginal delivery rates.** Operative vaginal births are associated with decreased rates of maternal morbidity as compared with cesarean section (Goetzinger & Macones, 2008). However, concerns regarding patient safety have resulted in fewer operative vaginal deliveries (Goetzinger & Macones, 2008). Therefore, the decline in the rate of operative vaginal delivery has been identified as another factor in the increased cesarean rate in the United States. In 1995, the rate of operative vaginal delivery was 9.38% (Martin, Hamilton, Osterman, Curtin, & Mathews, 2013). In 2005, the rate was 4.8%. (Martin & Menacker, 2007). At the time of this writing, the rate for 2012 had declined to 3.4% (Martin et al., 2013). As fewer operative deliveries are being performed, there are fewer training opportunities for obstetric residents, resulting in further changes in practice, and increasing the likelihood of more cesarean deliveries (Maulik, 2004; Powell et al., 2007; Spong et al., 2012). In the 2014 Obstetric Care Consensus, operative vaginal delivery training is encouraged, and second stage operative vaginal delivery, performed by well trained and experienced physicians, should be “considered a safe, acceptable alternative to cesarean delivery” (ACOG & SMFM, 2014, p. 10).

**Patient requested cesarean.** The influence of women’s requests for primary cesarean sections has been implicated as a possible contributor to the rising cesarean rate (Weaver et al., 2007). However, it is difficult to monitor how many cesareans may be done on maternal request, as it is not routinely listed on birth certificate information (Mayberry, 2006). Menacker, Declercq, & Macdorman (2006) examined delivery trends in the United States, utilizing birth certificate data and the National Hospital Discharge Summary from approximately 4 million births per year. The authors found that 3-7% of

primary cesarean sections being performed did not have an identified indication. There was no clarification as to whether these were implicitly done as a result of maternal request. This subset of women experiencing a primary cesarean with “no indicated risk” has been rising since 1996. For the years 1996-2001, there was a 25% increase in this category (54,866 to 80,028) (Declerq, Menacker, & MacDorman, 2005), which leads one to suspect that this category might include women who are requesting cesarean section.

Women request cesarean for multiple reasons. Gamble and Creedy (2007) concluded that women request cesarean section due to fear of vaginal delivery, lack of support, a perception of increased safety of cesarean, and culture. A request for cesarean section may be related to a perceived lack of control, or a history of a physically or psychologically traumatic delivery (Gamble & Creedy, 2007). In these instances, women should receive childbirth education, support during labor, and given the option of anesthesia during labor (ACOG, 2007).

The birth preferences of 310 pregnant women between 36-40 weeks of pregnancy were studied using questionnaires (Gamble & Creedy, 2001). Women overwhelmingly preferred a spontaneous vaginal delivery (n=290, 93.5%) to the prospect of a cesarean birth (n=20, 6.4%). Those women who preferred cesarean delivery were more likely to be multiparous (n=13), more likely to have had a delivery described as disappointing, and were more likely to be frightened and anxious about delivery. The authors stated that few women in this study knew of the short-term or long-term implications of a cesarean delivery, and perceived the risks as being minor. This may indicate that women may not have had an informed choice regarding delivery, and may have been led to believe that cesarean section was a safer option (Gamble & Creedy, 2001).

**Rise in primary cesarean rate.** The rise in the overall cesarean rate was accompanied by a significant increase in the rate of primary cesarean delivery, or the first cesarean delivery (Spong et al., 2012). The rate of primary cesarean was 15.0 % in 1995, rose to 15.8% in 2000, and significantly increased to 24.3% in 2005. For 2012, the rate of primary cesarean was 21.5% (Martin et al., 2013).

A workshop was convened between the NICHD, the Society for Maternal-Fetal Medicine (SMFM), and ACOG (Spong et al., 2012). The purpose of this workshop was to synthesize available research and information regarding indications, factors, and practices that result in increased risk of primary cesarean delivery.

There are “very few absolute indications for cesarean delivery such as complete placenta previa, vasa previa, or cord prolapse” (Spong et al., 2012, p.1182). There are, however, several modifiable factors, such as provider and patient attitudes towards vaginal birth and cesarean.

Recommendations that resulted from this workshop included: induction of labor should not be done prior to 39 weeks in the absence of medical indications, adequate time for latent phase and the first and second stages should be given as long as the mother and fetus are stable, and that instrumental delivery is an appropriate delivery method (Spong et al., 2012). Discussions about the primary cesarean delivery should include the risks that the surgery may have on future pregnancies and deliveries, such as the risk of uterine rupture and abnormal placentation.

#### **Changes in childbearing population-obesity and maternal age.**

**Obesity.** Obesity, defined as a body mass index (BMI) of 30 or more, has significantly increased over the last 20 years in the United States (Centers for Disease

Control, 2010). The prevalence of obesity in women as of 2007-2008, was 35.5% (Flegal, Carroll, Ogden, & Curtain, 2010). It is associated with increased incidence of cardiovascular disease, Type 2 diabetes, and certain cancers (Centers for Disease Control, 2010). It has also been implicated as a risk factor for obstetric complications and cesarean section, though the full extent of its impact is unknown (Weiss et al., 2004).

Kaiser and Kirby (2001) performed a retrospective chart review of the records of 1881 low-risk women delivered by a nurse midwifery service between 1994-1998. All women were delivered in the same academic inner-city hospital. Women with prenatal complications (gestational diabetes, fetal malformations), chronic health conditions (unstable asthma, diabetes, and hypertension), and ERCS were excluded from the study. Women who had experienced preterm deliveries and TOLAC were included. The overall cesarean rate in this study was 5.1%, well below the national average and the recommendation for Healthy People 2000. The VBAC rate for this time period was not reported. For women with a normal BMI, the cesarean rate was 4.1%. However, for obese women, the cesarean rate was 7.7%. The study population was 77.1% African American and 90.6% single. While the authors explained that this was indicative of the population that was served, it does not reflect the general population. The mean maternal age, also a factor in increased risk of cesarean, was 21.1 years. While the study findings cannot be generalized beyond the population studied, obesity was identified as being a risk factor for cesarean section.

A secondary analysis of data from the prospective multicenter database study of First and Second Trimester Evaluation of Risk (FASTER) sponsored by the NICHD was undertaken (Weiss et al., 2004). The primary study evaluated first trimester nuchal



translucency, and correlated it with first and second trimester Down's Syndrome markers enrolling women at 10-14 weeks gestation creating 16,102 records. The secondary analysis involved the formation of three groups based on BMI classification, and collecting information from prenatal, intrapartum and neonatal records of the primigravida enrollees. The purpose of the study was to determine whether obesity is associated with pregnancy complications and primary cesarean section.

The normal weight (BMI <30) control cohort included 13, 752 (85%) primigravidas. The obese group included 1, 473 (9%) primigravidas who had a BMI of 30-34.9, and the morbidly obese group included 877(6%) primigravidas with BMI of greater than 35. The overall cesarean rate in the sample was 22.7%. In the normal weight group, the cesarean rate was 20.7%. However in the obese group, the cesarean rate was 33.8% and in the morbidly obese group, the cesarean rate was 47.4%. While this study was limited by the retrospective chart reviews and its exclusion of multiparas, it demonstrated that obesity is an independent risk factor for primary cesarean delivery.

A retrospective observational study, entitled "Consortium on Safe Labor" was undertaken to collect comprehensive information regarding current obstetric practice in the United States (Zhang et al., 2010). The hospitals were chosen based on their geographic location (ACOG district representation), and on the availability of electronic medical records. Of the nineteen hospitals that participated, 8 were university affiliated, 9 were teaching community hospitals, and 2 were non-teaching community hospitals. A total of 228,668 medical records from 2002-2008 were examined.

Obese and morbidly obese women in the sample were at a significantly increased risk of delivering by cesarean section, including both primary and repeat. The results are

shown in Table 2. Although this study was limited by its exclusion of VBAC rates, inclusion of small community hospitals and over representation of teaching institutions, it demonstrated that obesity is a factor in cesarean rates.

Table 2

*Obesity as a Risk Factor for Cesarean Section*

| BMI                      | Primary Cesarean Rate | Repeat Cesarean Rate | Overall Cesarean Rate |
|--------------------------|-----------------------|----------------------|-----------------------|
| <25                      | 14%                   | 8.4%                 | 22.4%                 |
| 25-29.9<br>overweight    | 15.8%                 | 9.8%                 | 25.6%                 |
| 30-34.9<br>obese         | 19.3%                 | 13.3%                | 32.6%                 |
| >35<br>morbidly<br>obese | 24.6%                 | 19.2%                | 43.7%                 |

Adapted from “Contemporary cesarean delivery practice in the United States” by J. Zhang, J. Troendle, U.M.Reddy, S.K. Laughon, D.W. Branch, R. Burkman, ... and C.G. Hatjis, 2010, *American Journal of Obstetrics and Gynecology*, 203(326), e1-10.

**Maternal age.** The average maternal age at time of first delivery has risen from 21.4 in 1970 to 25.0 in 2007 (Martin et al., 2010). Women aged 35 or older having their first child has significantly impacted this national average (Mathews & Hamilton, 2009). The birth rate for women ages 35-39 for 2007 was 47.5 per 1, 000, which is the highest rate since 1964 (49.9 per 1,000). This constitutes an increase of 50% since 1990. Birth rates for women ages 40-44 have steadily increased since 1981, and were reported to be 9.5 per 1,000 (2007). The birth rate for women ages 45-49 was .6 per 1, 000, constituting an increase since 1993 (.3 per 1000) (Martin et al., 2010). The increase in the birth rate has been partly attributed to the use of assisted reproductive technology (Martin et al., 2010).

Maternal age over 35 years has been identified as a risk factor for labor dystocia and cesarean section (Lowe, 2007). It has been hypothesized that this might be due to decreased uterine contractility secondary to age (Smith et al., 2008). Cesarean rates have been consistently rising in correlation with maternal age (MacDorman et al., 2008). While the overall cesarean rate in the United States in 2007 was 32%, it was higher for women over the age of 35. For women aged 35-39, the cesarean rate was 42%, and for women aged 40-54, the cesarean rate was 48% (Menacker & Hamilton, 2010). While this information suggests an association between maternal age and cesarean rates, research is needed to verify this relationship.

**Induction of labor.** The rate of induction of labor (IOL) in the United States increased from 9.5% in 1990 to 22.8% in 2012 (Martin et al., 2010; Martin et al., 2013). Induction of labor (IOL) is performed for a multitude of reasons and indications ranging from convenience of the patient or provider to the presence of pregnancy complications. IOL is not a benign undertaking, as it has a cascade of associated interventions. Some of these interventions include IV placement, artificial rupture of membranes, the use of the induction agents, and confinement to bed (Simpson & Thorman, 2005). Ultimately, IOL is associated with an increased risk of cesarean section.

Yeast, Jones, & Poskin (1999) performed a retrospective study of 18,055 singleton pregnancies that had been delivered at a community hospital over a period of 7 ½ years. The authors noted that the IOL rate increased from 32% to 43% during the time of the study, and the overall rate of cesarean delivery remained at or below 20% during this time. However, it was found that the risk of cesarean was double for nulliparous women who underwent IOL vs. nulliparous women who spontaneously labored.

Another group of investigators found that elective IOL was found to be a significant risk factor for cesarean delivery in nulliparous women (Seyb et al., 1999). Term, nulliparous women (n=1561), experiencing labor with vertex singleton pregnancies over an 8 month period were included in this cohort study. The cesarean rate was examined for women who were in one of three groups: 1)experiencing elective IOL (17.5%; OR 1.89; 95% CI 1.12,3.18), 2)medically indicated IOL (17.7%;OR 1.69; 95% CI 1.13, 2.54), or 3)spontaneous labor (7.8%). The findings suggest that the overuse of IOL carries increased risk of cesarean delivery. Further, the authors concluded that avoiding elective IOL is an approach that would decrease the rate of primary cesarean section.

Vahratian et al. (2005) analyzed delivery data on low risk nulliparous women who underwent elective IOL compared with those who experienced spontaneous onset of labor. The women in the study included 1771 women with spontaneous onset of labor, 143 women who underwent cervical ripening prior to IOL, and 286 women with oxytocin induction. All cervical ripening was performed with intracervical foley bulb insertion. Despite the limitations of the retrospective study design, the authors found that labor progression was significantly different between women who experience IOL compared to those who had spontaneous labor onset. Elective IOL in nulliparous women with an unfavorable cervix was found to be associated with a 3.5 times greater risk of cesarean than for women who labored spontaneously (Vahratian et al., 2005).

A retrospective cohort study was undertaken to examine labor complications of multiparous women who underwent IOL (Battista, Chung, Lagrew, & Wing, 2007). A total of 9637 multiparous women with live, singleton, term pregnancies were included in

this study. Spontaneous labor was experienced by 7208 women, 2190 women were induced using oxytocin, and 239 underwent induction after using cervical ripening agents. Women who were induced with oxytocin were 37% (OR, 1.37; 95% CI, 1.10-1.71) more likely to deliver via cesarean section than those who underwent spontaneous labor. If a cervical ripening agent was necessary, the risk of cesarean nearly tripled (OR, 2.82; 95% CI, 1.84-4.53). Therefore, in multiparas, IOL was associated with increased risk of cesarean birth.

IOL has been occurring at increasing rates in the United States (Martin, 2009). Regardless of parity, induction of labor has been associated with an increased risk of cesarean section (Battista et al., 2007; Seyb et al., 1999; Vahratian, 2005; Yeast et al., 1999). It is recommended that the goal of all inductions be a vaginal birth, inductions should not be done without a medical indication prior to 39 weeks, and that the definitions of “failed” induction of labor and “arrest of labor” be reexamined in order to decrease the risk of cesarean section (Spong et al., 2012). In the 2014 Obstetric Care Consensus (2014), it was recommended that induction of labor prior to 41 weeks generally should be for maternal or fetal indications (ACOG & SMFM, 2014).

**Disciplinary and personal philosophies.** Provider attitudes and personal philosophies also played a role in the prevalence of cesarean. Monari et al. (2008) explored the attitudes of midwives and physicians towards cesarean section using face to face structured interviews and a 35 item questionnaire. Of a possible 262 practitioners (153 midwives/109 obstetricians), 248 (148 midwives/100 obstetricians) were interviewed. Sixty five percent of the midwives felt that the cesarean rate in their department was too high, in comparison with 34% percent of the physicians. Physicians

offered elective RCS more often compared to the midwives. For women who had their primary cesarean for fetal distress, 13% of the physicians offered elective RCS compared with 2% of the midwives. Physicians were also more likely than midwives to offer an elective RCS to women who had a primary section for breech (9% vs. 2.7%), or for failure to progress (27% vs. 6.8%). The authors concluded that midwives and physicians differ in their attitudes regarding cesarean section, regardless of gender, due to professional roles. These attitudes may have implications for the informed consent process for women considering VBAC.

**Term breech management.** The management of breech presentation at full term has also been implicated as a factor in the rise of cesarean delivery. A landmark study, comprised of 2088 women from 121 centers in 26 countries, significantly impacted the management of breech presentations at the beginning of this decade (Hannah et al., 2000).

The research subjects were randomized to either a planned cesarean group (n=1041) or a planned vaginal delivery group (n=1042). Vaginal delivery occurred in 56.9 percent of those planning on a vaginal birth. Planned cesarean delivery was found to be associated with a lower incidence of perinatal mortality, neonatal mortality, and serious neonatal morbidity than vaginal delivery (1.6% vs. 5.0%,  $p < 0.0001$ ). Serious neonatal morbidity included intracerebral hemorrhage, spinal cord injury, basal skull fracture, brachial plexus injury, significant neonatal genital injury, seizures in the first 24 hours, seizures necessitating the use of two or more drugs, hypotonia, coma, stupor/reduced reaction to pain, Apgar score of  $< 4$  at 5 minutes, cord blood base deficit of  $\geq 15$ , intubation and ventilation for more than 24 hours, tube feeding for more than 4

days, and/or NICU stay of longer than four days. Many of these criteria are related to short term outcomes, and are not indicative of long term impairment. However, there were no differences found in maternal mortality or serious maternal morbidity. The impact of this study was found in the rapid decline of vaginal breech deliveries that occurred in the years following the publication, and in the ACOG Committee Opinion no. 265 (2001).

While it was recommended that vaginal breech birth be avoided by use of external cephalic version, it was suggested that a planned vaginal delivery of a singleton breech was no longer acceptable, and that women with a fetus in any breech presentation should undergo a cesarean delivery (ACOG, 2001). The adoption of this management approach resulted in fewer training opportunities for vaginal breech delivery, and therefore, fewer practitioners that were comfortable attempting a vaginal breech delivery.

In 2006, the ACOG organization changed its stance on vaginal breech deliveries, addressing that health care provider's experience should impact the mode of delivery, and that planned vaginal delivery of a breech may be appropriate depending on hospital guidelines (ACOG, 2006). However, five years had lapsed since the 2001 publication of the ACOG position statement, during which women had cesarean deliveries for breech presentations. Undoubtedly many of these women had subsequently undergone ERCS, which resulted in increasing cesarean rates and declining VBAC rates.

In the 2014 Obstetric Care Consensus, vaginal breech delivery was addressed. It was recommended that if a vaginal breech delivery was planned, the woman should receive informed consent including the increased short term and long term risks of perinatal/neonatal morbidity and mortality when compared to cesarean delivery.

**Patient education and information.** As previously stated, the informed consent process for VBAC is not standardized, and women may receive biased information that impacts their VBAC decision. The information and education women receive may reflect the philosophies of their provider, not evidence based practice. The timing of these discussions is important, and they should be held prior to the next pregnancy, or at the very beginning of one, as women may be forming their opinions about delivery during this time (Eden, Hashima, Osterweil, Nygren, & Guise, 2004). During the VBAC decision-making process, women benefit from receiving individualized information that is unbiased and research based. Receiving this individualized information may have a positive impact on how they perceive a delivery that does not go as they had hoped. Furthermore, individualized information and education also assists them in giving truly informed consent by supporting emancipation in their decision-making. Studies regarding patient education and decision making regarding mode of delivery will be discussed in an upcoming section regarding qualitative inquiry.

### **Benefits of VBAC**

The benefits of VBAC, particularly those that are physical, are extensively documented in the literature. These benefits include the avoidance of operative complications (infection, hemorrhage, transfusion, and damage to surrounding organs), shorter hospital stay, faster recovery, lower rehospitalization rates, and overall lower rates of maternal morbidity and mortality (Cleary-Goldman et al., 2005; Lydon-Rochelle et al., 2000; Simpson & Creehan, 2008). VBAC has been found to have overall better maternal and neonatal outcomes than ERCS and cesarean after a failed TOLAC (Landon et al., 2004; Tan et al., 2007). Women who undergo VBAC avoid the risks assumed by



additional uterine scarring that impact future pregnancies (Smith, Pell, & Dobbie, 2003).

Additional benefits to VBAC that will be discussed in the following section include the decreased costs of VBAC (if it is successful), as well as the psychological benefits including increased levels of satisfaction associated with this mode of delivery. Table 3 outlines the research for this section.

Table 3

*Benefits of VBAC*

| 1 <sup>st</sup> Author & Year | Risk/Benefit Type                                 | Design  | Purpose   | Total <i>n</i>                                     | Maternal Subjects | Neonatal Subjects | Findings  |
|-------------------------------|---|---|---|--|-------------------|-------------------|---|
| Chung (2001)                  | Benefit-Cost effectiveness                        | Computerized model of hypothetical woman  | Explored cost effectiveness of VBAC                       | 1 computerized model                               |                   |                   | By using this computerized model, it was determined that if a woman had a 65-75% chance of a successful VBAC, it was a cost effective option. |
| DiMaio (2002)                 | Benefit-Cost effectiveness                        | Retrospective   | Explore cost effectiveness of VBAC compared with ERCS     | 204 matched mom-baby pairs<br>65 ERCS<br>139 TOLAC | X                 | X                 | VBAC is more cost effective than ERCS. VBAC rate: 74.8%   |
| Gilbert (2013)                | Benefit-Cost effectiveness                        | Decision analytic model (Markov) of a hypothetical cohort with no contraindications to a VBAC | Explored cost effectiveness of VBAC compared with ERCS    | 1 Markov model                                     |                   |                   | By using this model, it was demonstrated that \$164.8 million would be saved per 100,000 women.   |
| Fenwick (2003)                | Benefit-Psychological                             | Pilot-Descriptive   | Gain perspective from healthcare consumers regarding VBAC | 59 responded<br>121 birth experiences              | X                 |                   | Women with VBAC rated their delivery experience higher than those that did not experience VBAC.   |
| Smith (2003)                  | Benefit-Avoidance of increased risk of stillbirth | Retrospective   | Determine whether primary CS related to                   | 17,754 previously delivered by CS                  | X                 |                   | Risk of stillbirth at 34 weeks was increased in women with prior CS (0.38% vs. 0.23%).  |

|                  |   |                           |   |  |   |   |   |
|------------------|---|---------------------------|---|--|---|---|---|
| Alexander (2006) | Benefit-Avoidance of operative complications              | Retrospective             | unexplained stillbirth in subsequent pregnancies<br>To describe the incidence and type of neonatal injury resulting from CS | 102, 879 previously delivered vaginally<br>37, 110 reviewed<br>418 (1.1%) experienced injury |   | X | Highest risk of injury occurred in those born by primary cesarean after unsuccessful attempt at operative vaginal delivery  |
| Silver (2006)    | Benefit-Avoidance of further uterine scarring             | Prospective Observational | Estimate the impact of increased CS and maternal morbidity  | 30,132 women who had a CS  | X |   | Increased numbers of CS result in increased rates of abnormal placentation.   |
| Tan (2007)       | Benefit-Avoidance of operative complications              | Retrospective             | Assess outcomes of women undergoing VBAC vs. RCS  | 1,000  | X | X | VBAC less likely to result in hemorrhage, reduced risk of operative complications. NICU admissions were more common with those born by ERCS than by VBAC (6.0% vs. 2.7%).<br>VBAC rate: 71.2% |
| El-Sayed (2007)  | Benefit-Avoidance of operative complications              | Retrospective             | Compare maternal and neonatal outcomes after successful and failed TOLAC  | 1,284 TOLAC<br>1094 successful<br>190 failed   | X |   | Women with failed TOLAC significantly more likely to experience chorioamnionitis, hysterectomy, and postpartum hemorrhage. VBAC rate: 85.2%   |
| Meddings (2007)  | Benefit-Impact on hospitalization and postpartum recovery | Qualitative               | Examine the lived experience of women electing to VBAC  | 8 women  | X |   | One of three major themes identified the difference in recovery experiences. CS associated with a longer and more painful recovery  |

**Avoidance of operative complications.** A study of the labors and perinatal outcomes of 1000 women at term with one previous LTCS was undertaken (Tan et al., 2007). This was a retrospective cohort study involving chart review. Of the 1000 women, 232 of them elected to have a RCS, and 768 elected to have a TOLAC. VBAC resulted in 71.2 % (n=547) of those electing a TOLAC, and 221 women underwent cesarean delivery after an unsuccessful TOLAC. Those women who had a VBAC were less likely to experience a hemorrhage of more than 500 mL than those that elected a RCS (6.6% vs. 34.1), and also less likely to experience a hemorrhage of more than 1000 mL (.7% vs. 4.3%). There was a reduced risk of blood transfusion in women who experienced VBAC compared with that of women who elected a RCS (2.9% vs. 7.3%). In addition, there was a reduced risk of “operative complications” in women who had a VBAC vs. an elective RCS (0% vs. .9%). However, this category of “operative complications” was not well defined.

A retrospective cohort study of 1284 successful and failed singleton TOLAC was undertaken to provide more information regarding maternal and fetal outcomes, independent of uterine rupture (El-Sayed et al., 2007). In this study, TOLAC resulted in 1094 (85.2%) VBACs and 190(14.8%) failed TOLAC. Perinatal outcomes involving uterine rupture were deliberately excluded from this study, so as to better understand the outcomes involved for most women that attempt a TOLAC. Furthermore, the authors investigated factors that impacted the success or failure of a TOLAC.

Maternal outcomes that were included in this study were hemorrhage, transfusion, hysterectomy, and chorioamnionitis. Women who had a failed TOLAC were more likely to experience chorioamnionitis (25.8% vs. 5.5%,  $P<.001$ ), and postpartum hemorrhage

(35.8% vs. 15.8%,  $P < .001$ ). Hysterectomy was encountered in 1% ( $P < .022$ ) of women with a failed TOLAC, and not encountered in women who experienced VBAC. This study was limited by the fact that these women had already decided to attempt a TOLAC, and by the lack of uniform data across the two research sites. In addition, the authors stated that it was uncertain if women who have a failed TOLAC without a prior cesarean section have complications that are different from those women that experience a failed TOLAC. As stated previously, these results highlight the need for ongoing research and greater understanding of those existing factors that make a TOLAC more likely to succeed.

**Neonatal outcomes.** The benefits of VBAC to the neonate include the avoidance of complications that might be encountered due to a RCS or failed TOLAC. These complications include a 2.9 times greater risk of mortality (MacDorman et al., 2006), respiratory morbidity (Hook et al., 1997), sepsis (El-Sayed et al., 2007), jaundice (El-Sayed et al., 2007), acidosis (El-Sayed et al., 2007), pneumonia (El-Sayed et al., 2007), delayed maternal contact (Chalmers et al., 2010), and breastfeeding difficulties (Zanardo et al., 2010). Additional literature regarding neonatal outcomes is addressed in upcoming sections regarding failed TOLAC and repeat cesarean.

The retrospective chart review by Tan et al. (2007) examined several neonatal outcomes in a study of 1000 consecutive women with one prior LTCS delivery. Women were excluded if they had two or more previous cesareans, an unknown scar, a vertical uterine scar, multiple gestation, or fetal anomalies. Other exclusion criteria included those in which a cesarean was indicated for breech presentation, preeclampsia, transverse lie, or placenta previa. Maternal outcomes were previously discussed.

There were three cases of perinatal mortality in the TOLAC group. However, the authors explained that none of these deaths were due to uterine scar rupture. One case involved a woman that presented at 41 weeks with an intrauterine fetal death, and meconium stained fluid. The second involved a woman at 37 weeks of gestation with premature rupture of membranes. An induction of labor was begun. After 10 hours, fetal intolerance of labor necessitated a cesarean section. However, the cesarean was difficult due to the low station of the fetal head. The child was born without any signs of life, and the resuscitation was unsuccessful. The third perinatal death occurred in a patient that presented with spontaneous labor, and was delivered by cesarean for fetal intolerance of labor. Meconium aspiration occurred, and the infant died on day 4.

No infants born by ERCS had 5 minute Apgar scores of less than 7, while one infant delivered by VBAC had a five minute Apgar score of less than 7(.2%). Admissions to the NICU occurred with 2.7% of those infants delivered by VBAC ( $P=.037$ ), and with 6.0% of those delivered by ERCS. However, measures of neonatal outcomes such as an Apgar of less than 7 at 5 minutes and NICU admissions, while informative, are not indicative of long-term harm or injury to the neonate. While the sample size was small, the inclusion and exclusion criteria were clear. Another benefit of VBAC to the neonate involves the eradication of risk related to surgical injury. Cesarean delivery is known to result in fetal injury, but the incidence and type of injury are not consistently characterized in the literature (Alexander et al., 2006).

In order to describe the incidence and type of fetal injury, a prospective cohort study was conducted between January 1, 1999, and December 31, 2000 at 13 university medical centers. In total, information was obtained from the medical records of 37, 110

live born singleton deliveries. In this sample, there were 418 (1.1%) fetal injuries. The incidence and type of each specific fetal injury is presented in Table 4.

Table 4

*Fetal Surgical Injury Resulting From Cesarean Section*

| Type of Injury         | Number<br>(Incidence per 1000) |
|------------------------|--------------------------------|
| Total number           | 418 (11.3)                     |
| Skin laceration        | 272 (7.3)                      |
| Cephalohematoma        | 88 (2.4)                       |
| Clavicular fracture    | 11 (0.3)                       |
| Facial nerve palsy     | 11 (0.3)                       |
| Brachial plexus injury | 9 (0.2)                        |
| Skull fracture         | 6 (0.2)                        |
| Long bone fracture     | 8 (0.2)                        |
| Intracranialhemorrhage | 2 (0.1)                        |
| Other                  | 20 (0.5)                       |

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Adapted from “Fetal Injury Associated With Cesarean Delivery” by J.M.Alexander, K.J. Leveno, J.Hauth, M.B.Landon, E.Thom, C.Y.Spong... and S.G. Gabbe, 2006, *Obstetrics and Gynecology*, 108, 885-890.

The authors discovered that the highest risk of injury occurred in those infants born by primary cesarean after an unsuccessful attempt at operative vaginal delivery, and the lowest risk to those having a RCS without a TOLAC. Therefore cesarean delivery, often presumed to be a safer delivery method fetus, is not without risk of injury.

**Impact on hospitalization and postpartum recovery.** The National Institutes of Health Consensus Development Conference Statement (Cunningham et al., 2010a) stated that shorter hospitalizations exist following a TOLAC (not VBAC specific) when compared to ERCS, although this finding may not hold true for morbidly obese women. Research findings support that VBAC is associated with shorter hospital stays. For example, in the study by Tan and colleagues (2007), previously discussed, the authors found that only 2.6% of women who experienced VBAC stayed in the hospital four or more days, compared with 31.5% of women who elected to have a RCS.

Meddings, Phipps, Haith-Cooper, and Haigh (2007) examined the lived experiences of 8 women who elected to attempt VBAC. Semi-structured interviews were conducted in women's homes antenatally (after the 34<sup>th</sup> week of pregnancy), and again at about 6 weeks postpartum. Two women underwent RCS. Data analysis was done manually using Burnard's 14 stage process. Data was analyzed by two or more researchers, and then verified by an experienced researcher that was not directly involved in the study. One of three major themes identified in the study involved the difference in recovery experiences. The other two themes involved informed choice and influences on maternal-infant bonding. All women who experienced both types of delivery noted that a cesarean resulted in a longer and more painful recovery than a vaginal delivery. The women described this as particularly important when trying to meet the needs of their family during the postpartum period.

**Cost effectiveness.** The cost effectiveness of VBAC has been studied from several perspectives. It has been found to depend on the likelihood of a successful TOLAC.



Chung and colleagues studied cost effectiveness using a computerized model of a hypothetical 30 year old patient, incorporating data from peer reviewed studies including incidences of short and long term complications and maternal and fetal morbidity and mortality, and actual hospital costs (Chung et al., 2001). Included in this computerized model were health care expenditures for injured infants to one year of life. The authors concluded from this model that if the hypothetical woman had a 65-75% chance of a successful TOLAC resulting in VBAC, it was a cost effective option. This study's results, while interesting, were dependent on the accuracy of the variables that were included in the computerized model. However, these findings support the importance of careful selection of TOLAC candidates in predicting the likelihood of success.

The cost effectiveness of VBAC was explored in a retrospective cohort analysis (DiMaio, Edwards, Euliano, Treloar, & Cruz, 2002). Inclusion criteria were one prior cesarean delivery, a gestation of 36 weeks or greater, singleton pregnancy, with no antenatally diagnosed fetal anomalies. The average cost of hospital care for mother and infant was obtained from the hospital's Clinical Resource Department. There were 204 matched mother-infant pairs, of which 65 had an ERCS and 139 had a TOLAC. One hundred and four women (74.8%) who attempted a TOLAC experienced VBAC. Overall costs (combined for maternal and neonatal care) associated with an ERCS (\$5949) were significantly ( $P < .001$ ) higher than those of a TOLAC (\$4863). When a TOLAC resulted in VBAC, the cost of caring for the pair was \$4411. If the TOLAC resulted in a repeat CS, the overall cost increased to \$6272. The authors concluded that VBAC is the most cost effective option, as long as the success rate exceeds 18%.

A Markov model comparing the lifetime cost-effectiveness of a TOLAC versus an ERCS was developed (Gilbert et al., 2013). Markov models may be utilized when studying risk over a period of time, when events may happen more than once, or when timing of events is important (Sonnenberg & Beck, 1993, p. 322). A hypothetical cohort of 100,000 women with one prior LTCS, no contraindications to a TOLAC, and in spontaneous labor was developed. Participants from a prospective study were chosen to derive probability estimates for potential events in three subsequent pregnancies.

For the hypothetical baseline cohort, choosing a TOLAC would result in 80,229 fewer cesareans, and a cost savings of \$164 million. Lower rates of cesarean resulted in decreased rates of complications including hysterectomy, placenta previa, placenta accreta, and maternal death. TOLAC was associated with uterine rupture, neonatal death, HIE, and cerebral palsy. Unlike studies before it, this one incorporated several long term health outcomes for both the mother and infant in determining whether or not a TOLAC would be cost effective across a lifetime. The authors reported that if the probability of a successful TOLAC was 67.2 % or greater, and the risk of uterine rupture was 3.1% or less, the TOLAC was preferred. If the probability of a uterine rupture was 0.8%, which was the baseline rate for hypothetical cohort, and the probability of a successful TOLAC was 47.2% or greater, the TOLAC was preferred.

**Avoidance of further uterine scarring.** It is understood that with each cesarean section, the endometrial layer of the uterus is irreparably damaged (Rosen, 2008). This makes the area unsuitable for implantation of subsequent pregnancies. If a woman has additional scars, each incision is made higher than the last, in order to avoid bladder injury from adhesions (Rosen, 2008). In addition, if a woman has a RCS without labor

(such as the case in ERCS), the incision is placed higher, as the lower uterine segment has not had the opportunity to thin due to the natural mechanism of labor (Rosen, 2008).

Prior cesarean, with its associated uterine scarring, is a known risk factor for developing placenta accreta in future pregnancies. It is believed that due to the need for a hypoxic environment early in development, the embryo may preferentially implant into the uterine scar (Rosen, 2008). Placenta accreta is a condition in which the placental tissue is abnormally adherent to the myometrial layer of the uterus, rather than the decidual layer. The tissue can further invade the complete myometrial layer, and is referred to as placenta increta. If the placental tissue goes completely through the myometrium and uterine serosa, it is referred to as placenta percreta. It is possible for the placental tissue to then invade surrounding organs, most commonly the bladder.

The risk of placenta accreta increases with each subsequent cesarean section. In a prospective observational cohort study of 30,132 women who had a cesarean delivery, the rates for placenta accreta were .24%, .32%, .57%, 2.13%, 2.33%, and 6.74% for women experiencing their first, second, third, fourth, fifth, and sixth cesarean sections (Silver et al., 2006). Abnormal placentation is associated with significant maternal hemorrhage and maternal morbidity at the time of delivery (Rosen, 2008). Bladder injury, infection, ureteral damage, spontaneous uterine rupture, and hysterectomy are well-known complications of abnormal placentation (Rosen, 2008).

VBAC gives women the opportunity to avoid those complications that are associated with RCS. In addition, VBAC can assist in optimizing future pregnancy outcomes, and preserving fertility by avoiding the increased risk of abnormal placentation in future pregnancies.

**Decreased incidence of stillbirth.** Another complication of cesarean section is an increased risk of unexplained stillbirth in subsequent pregnancies after 34 weeks of gestation (Smith et al., 2003). In a retrospective cohort study to determine whether a primary cesarean was associated with an increased risk of antepartum stillbirth in the subsequent pregnancies, the authors examined the records of 120,633 second singleton births in Scotland between 1992-1998. Exclusionary criteria included multiple gestation, delivery outside 24-43 weeks of gestation, fetal anomalies, Rh isoimmunization, birthweight less than 500 grams, and records that were missing values. Birth records of the first delivery were compared with the second delivery in the same woman. Among the 17,754 women who previously delivered by cesarean section there were 68 stillbirths (0.38%) compared to 244 in 102,879 (0.23%) women who had delivered vaginally. The researchers found that the risk of stillbirth at 34 weeks was 1.77 per 1,000 for those women with a prior cesarean, and .89 per 1,000 for those that had a vaginal delivery. At 39 weeks, the risk was 1.06 per 1,000 with a prior cesarean, and .47 per thousand for the vaginal birth group. In addition, the authors stated that there were significant associations between a prior cesarean delivery and intrauterine growth restriction and preterm birth in a subsequent pregnancy. Criticisms of the study include that maternal smoking was not addressed in birth data reports prior to 1992, the statistics from analysis were not provided, and a table referenced by the authors was not included in the article. While stillbirth occurs infrequently, this study does reveal an association with cesarean that is worthy of further study.

**Psychological benefits.** The physical risks and benefits of VBAC, cesarean section, and TOLAC have been presented from a myriad of perspectives. However, there

are psychosocial implications that must be considered (Meddings et al., 2007), as women have suffered psychologically from surgical birth (Bainbridge, 2002). The long-term maternal psychosocial outcomes following VBAC, unsuccessful TOLAC, and elective cesarean section represents a critical gap in evidence (Cunningham et al., 2010a).

Feelings of powerlessness and helplessness during childbirth have been correlated to decreased patient satisfaction (Fenwick, Gamble, & Mawson, 2003). A pilot descriptive study was undertaken to gain perspective from healthcare consumers regarding cesarean section and VBAC. A survey of 22 open and closed-ended questions was distributed through a Birthrites newsletter. Birthrites is an evidence-based electronic information sharing resource that advocates for VBAC, and serves to support women who have delivered by cesarean section. The survey was sent to a convenience sample of 100 women, and 59 responded. Four women had never had a cesarean section, and their responses were excluded from the analysis. Content analysis was performed for the open-ended questions to determine themes, and descriptive statistics were employed for the fixed choice questions.

The respondents who experienced cesarean section commonly reported (it was not stated how commonly) that forced separation from their infant, not being able to “properly hold, see, touch, or breastfeed” (Fenwick et al., 2003, p.14) contributed to a more negative perception of their birth experience. Cesarean birth respondents described feeling a loss of control, being treated negatively by caregivers, and having violated expectations of the birth experience. When given the opportunity to assign a numerical rating to their delivery experience, with “1” being “really bad” and “10” being excellent, the mean rating was “3”. In contrast, those women who experienced VBAC reported a

mean subjective rating of “9”. Themes that emerged from their responses included feeling supported by those caring for them, and a sense of empowerment and control over their labors. For many women, the experience of VBAC was one of healing.

As discussed previously, the childbirth experience has a profound impact on the life of a woman. In an upcoming section, the studies regarding the experience of VBAC will be reviewed.

### **Risks Associated with VBAC**

The risks of VBAC have been extensively documented in the literature, and include those risks involved in a failed TOLAC, and uterine rupture. Sequelae of a failed TOLAC, which include chorioamnionitis, hemorrhage, hysterectomy, and neonatal morbidity, will be discussed at length in an upcoming section. Uterine rupture and the factors associated with it will be explored.

Numerous variables associated with successful and failed TOLAC have been identified in the literature. VBAC prediction models have been developed to assist in the selection of VBAC candidates, thereby increasing the likelihood of a successful TOLAC.

**Selection of Candidates.** Many factors have been identified as being correlated to VBAC success, including demographic and obstetric indices (Cunningham et al., 2010a). For example, young, healthy women who are Caucasian, with a normal BMI, and have had a previous vaginal delivery have the greatest chance of a successful VBAC (Cunningham et al., 2010b).

Women who have had a prior cesarean section may have the opportunity to attempt a TOLAC if they plan to deliver at an institution, with a healthcare provider that offers the option. Central to any discussion regarding a TOLAC is prediction of VBAC

success. While during the informed consent process, it is recommended that this discussion be personalized, VBAC prediction tools have been developed based on factors present at the first prenatal visit, and factors that are present upon admission (Flamm & Geiger, 1997; Troyer & Parisi, 1992). In order to make women more fully aware of their personal characteristics that could impact TOLAC success, it has been suggested that this counseling be done at the very first prenatal visit (Shipp, Zelop, & Lieberman, 2008).

To this end, several groups of researchers have developed prediction tools to facilitate the counseling process. Grobman et al. (2007) performed a study involving 19 participating academic medical centers that were affiliated with the NICHD Maternal Fetal Medicine Units Network, and then developed a tool that could be used to predict the success of a TOLAC. The records of women with a prior cesarean that presented for care in a subsequent pregnancy during the years of 1999-2002 were included in the study. Inclusion criteria included having a live, singleton, term, vertex pregnancy undergoing a TOLAC. Trained research nurses identified women who met the criteria for inclusion. Demographic, labor, delivery, and postpartum data were abstracted from medical records. There were 11,856 women who met the inclusion criteria, and 73% of them had a successful VBAC (8,659).

A multivariate logistic regression model was constructed in order to predict the likelihood of a VBAC, and included only factors that would be available at a first prenatal visit. VBAC was more likely in Caucasian, younger women with a lower BMI. If a woman had a prior vaginal delivery, and a non-recurrent indication for cesarean section, her chances of a successful VBAC were also increased. Points were given for each response, which corresponded to a sliding scale of probability at the bottom of the

nomogram. If a woman had a score of 60 points, her likelihood of having a VBAC was 78%. This tool is not useful for the care of all women with a prior cesarean, because it is based on women with one prior cesarean, a subsequent term pregnancy, and does not include antepartal factors that might impact the success of VBAC. However, the discussion generated by utilizing this prediction tool would be valuable for patient education and counseling.

Costantine, Fox, Byers, et al (2009) validated the prediction model described by Grobman, et al. (2007) at The University of Texas Medical Branch in Galveston. All women (545) with one prior LTCS, with a subsequent term pregnancy, attempting a TOLAC from January 2002-August 2007 were included. Of those, 502 had complete data available. VBAC occurred with 262 (52.2%) of women, although no rationale was given for this low success rate. The prediction of VBAC success was significantly higher in those that had a successful TOLAC (median 78.4%, interquartile range 62.1-88.2) than those that did not (median 59.7%, interquartile range 50.8-75.3). The authors stated that that this study validated the predictive success of the nomogram.

However, there was a large discrepancy in the VBAC success rates between the Grobman and Costantine studies. This may be explained by differences in the study populations. The Grobman study had maternal race distribution of 38.7% white, 19.9% Latina, 36.3% African American, and 5.1% other. In the Costantine study, 84.26% of the subjects were Hispanic, and 6.97 % were African American. Another potential reason for this discrepancy could be that during the time of the study, Texas was among the states with the highest cesarean rate. The Constantine study was conducted in Texas, and in 2007, at the end of the study, the rate of cesarean birth in Texas was 33.7% (Menacker &



Hamilton, 2010). In further determining the validity of the prediction tool, it would be advantageous to replicate the study again in an area with similar cesarean rates and population distribution. Further, a study that included CNMs/CMs as providers would help establish the utility of the instrument. As mentioned previously, CNMs/CMs are known to have lower cesarean and higher VBAC rates (ACNM, 2012).

When considering a TOLAC, the possibility of success is important, as is the assessment of risk. In order to determine patient factors that might be associated with uterine rupture, the records of 4383 trials of labor and 40 uterine ruptures that occurred from 1984-1996 in one academic hospital were examined (Shipp et al., 2008). Multiple logistic regression was utilized in order to assess for an increased risk of uterine rupture.

Patient factors associated with risk of uterine rupture were examined. These factors include an inter-delivery interval of less than 18 months, maternal age between 30-39 years, maternal age of 40 or more years, a history of 2 or more prior cesareans, and a history of a prior vaginal delivery. Each factor was given a score based upon an odds ratio. These odds ratios were determined by previous studies done using this dataset. A point value of -1 was given to the protective factor of a previous vaginal delivery. A score of 1 was given to those factors with an odds ratio of greater than one and less than 3. A score of 2 was given to those factors with an odds ratio of greater than 3. Table 5 outlines the risk factors for uterine rupture and their corresponding assigned predictive score.

Table 5

*Risk Factors for Uterine Rupture and Assigned Predictive Score*

| Factor                             | Odds Ratio      | Score |
|------------------------------------|-----------------|-------|
| Prior vaginal delivery             | 0.3(0.1, 0.9)   | -1    |
| Inter-delivery interval >18 months | 2.4 (1.0, 5.6)  | 1     |
| Maternal age 30-39 years           | 2.6 (1.1, 6.0)  | 1     |
| Two or more cesareans              | 5.3 (2.1, 12.9) | 2     |
| Maternal age 40 years or greater   | 5.8 (1.6, 20.3) | 2     |

Adapted from "Assessment of the Rate of Uterine Rupture at the First Prenatal Visit: A Preliminary Evaluation," by T.D. Shipp, C. Zelop, & E. Lieberman, 2008, *Journal of Maternal-Fetal & Neonatal Medicine*, 21(2), 129-133.

This scoring system was retrospectively applied to the sample. The overall scores ranged from -1 to +4. It was noted that as the predictive scores increased, so did the incidence of uterine rupture. Based on these scores, the authors were able to identify that 80.9% of their study population was at a low risk (.45%) of uterine rupture. Table 6 outlines the scores and corresponding risk of uterine rupture.

Table 6

*Predictive Score and Corresponding Risk of Uterine Rupture*

| Score | %(n) with score | %(n) with uterine rupture |
|-------|-----------------|---------------------------|
| -1    | 8.9%(391)       | 0.26% (1)                 |
| 0     | 36.8% (1613)    | 0.25% (4)                 |

|   |             |            |
|---|-------------|------------|
| 1 | 43.2%(1894) | 1.11% (21) |
| 2 | 8.4% (370)  | 2.43% (9)  |
| 3 | 2.5% (108)  | 3.7% (4)   |
| 4 | 0.2% (7)    | 14.29% (1) |

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Adapted from “Assessment of the Rate of Uterine Rupture at the First Prenatal Visit: A Preliminary Evaluation,” by T.D. Shipp, C. Zelop, & E. Lieberman, 2008, *Journal of Maternal-Fetal & Neonatal Medicine*, 21(2), 129-133.

This study was limited in its generalizability, as it was performed at a single site. Other factors that could contribute to an increased risk of uterine rupture (such as method of closure or febrile episode during recovery) were not included in the scoring model. Nonetheless, this tool may have clinical utility in predicting an individualized risk of uterine rupture during a TOLAC, and therefore may inform women and their families of potential risk.

**Uterine rupture.** Uterine rupture is defined as being complete, or incomplete, which is often referred to as a uterine dehiscence (Cunningham et al., 2010b). When a rupture is complete, all layers of the uterine wall are separated. The fetus, placenta, and/or umbilical cord may be partially or completely extruded into the peritoneal cavity. With uterine dehiscence, the uterine scar is separated, but the serosa is still intact (Landon, 2008). Due to the intact serosa, there is minimal risk for maternal and fetal hemorrhage, and there is no extrusion into the peritoneal cavity (Landon, 2008). Serious sequelae of complete uterine rupture include perinatal death, fetal brain injury due to hypoxia, and hysterectomy (Landon, 2008). Fetal prognosis may be particularly grim in

instances where the fetus is expelled into the peritoneal cavity, especially when accompanied by placental separation (Cunningham et al., 2010b).

Uterine rupture is usually attributed to TOLAC, and is associated with a significant risk of perinatal morbidity and mortality (Guise et al., 2010). Uterine rupture has occurred in women without prior uterine scarring, though its incidence is so low that most obstetric providers will never encounter it in practice (Landon, 2006; Miller et al., 1997). In developed countries, the rupture of an unscarred uterus is most likely due to abdominal injury such as gunshot wounds, stabbing, or motor vehicle accidents (Landon, 2006). In a retrospective study of perinatal outcomes over a 11 year period, the rate of uterine rupture with unscarred uteri was 1 in 16,849, after controlling for those resulting from trauma (Miller et al, 1997). Intrapartum uterine rupture in unscarred uteri was associated with pitocin use, prostaglandin use, instrumental vaginal delivery, grand multiparity, and malpresentation (Miller et al., 1997).

ACOG cited an overall uterine rupture incidence of .7-.9% with one prior cesarean section, and an incidence of .9-1.8% with two or more cesarean sections (ACOG, 2010a). This rate is a composite. It does not control for the numerous individual factors that have been implicated in the risk of uterine rupture, such as the number of prior cesareans. As has been demonstrated, there has been much variability in the reported rates of uterine rupture depending on the source of the data. For example the rate of uterine rupture following a LTCS has recently been reported to be as low as .2% (Daltveit et al., 2008), and as high as .9% (Stamilio et al., 2007). The major confounding factor in the variation in reported rates of uterine rupture is its inconsistent definition. The various definitions of uterine rupture are contained in Table7 including the source of

each. While several of these studies are from more than 10 years ago, these are widely cited, pivotal studies that helped shape the foundation of position statements and practice. The controversy that impacts the rates and their reporting will be explored more fully in the following sections.

Table 7

*Definitions of Uterine Rupture*

| Year | Author                             | Definition  |
|------|------------------------------------|---|
| 1994 | Flammet al.                        | “any defect that involved the entire uterine wall or was symptomatic or required operative intervention” (p. 928)   |
| 1994 | Miller et al.                      | a defect that involved the “entire uterine wall and was associated with at least one of the following: laparotomy for control of hemorrhage from the defect, hysterectomy or repair of the uterus or bladder, extrusion of any part of the fetus, placenta or umbilical cord through the defect; or cesarean for acute fetal distress”(p.256).  |
| 1995 | Naef et al.                        | “complete scar separation with bleeding, hematoma formation, or extrusion of the fetus” (p.1667).   |
| 1999 | Shipp et al.                       | “a complete disruption of the prior uterine scar in association with at least one of the following associated symptoms or signs: laparotomy for hemorrhage or hemoperitoneum, excessive injury to the uterus necessitating hysterectomy, injury to the bladder, extrusion into the peritoneal cavity of any portion of the fetal-placental unit, or cesarean delivery for non-reassuring fetal testing or suspected rupture.” (p. 736). |
| 1999 | Zelop et al.                       | “a complete disruption of the prior uterine scar with at least one of the following symptoms or signs: laparotomy for hemorrhage or hemoperitoneum, excessive injury to the bladder or any extrusion into the peritoneal cavity of any portion of the fetal-placental unit, cesarean delivery for non-reassuring fetal heart rate tracing, or suspected uterine rupture as evidenced by the acute onset of incisional pain.” (p.883).   |
| 2001 | Lydon-Rochelle et al.              | “Uterine rupture was considered to have occurred if ICD-9-CM diagnosis code 665.0 or 665.1 was recorded on the hospital-discharge form.” (p.4).   |
| 2002 | Bujold, Bujold, Hamilton, Harel, & | a defect that involved the entire thickness of the uterine wall, including the overlying peritoneum, with extrusion of  |

- Gauthier intrauterine contents into the peritoneal cavity that required operative intervention" (p. 1327 for 2002)
- 2002 Bujold & Gauthier "a uterine scar separation with the overlying visceral peritoneum (uterine serosa) opened" (p. 311)
- 2002 Bujold, Mehta, Bujold, & Gauthier "a defect that involved the entire thickness of the uterine wall, including the overlying peritoneum, with extrusion of intrauterine contents into the peritoneal cavity that required operative intervention" (p. 1199 for 2002).
- 2002 Shipp et al. "complete disruption of the prior cesarean scar with one or more of the following associated symptomatic factors: hemorrhage, need for hysterectomy, damage to the bladder, extrusion from the uterus of any portion of the fetal-placental unit, or indicated cesarean delivery for non-reassuring fetal testing or suspected uterine rupture" (p. 585).
- 2003 Durnwald & Mercer "a full thickness defect through myometrium and peritoneum" (p. 926)
- 2003 Ofir et al. Complete rupture involves the entire uterine wall and results in a direct connection between the peritoneal space and the uterine cavity (p. 1042).
- 2003 Shipp, Zelop, Cohen, Repke, & Lieberman "complete disruption of the prior cesarean scar with one or more of the following associated symptomatic factors: hemorrhage, need for hysterectomy, damage to the bladder, extrusion from the uterus of any portion of the fetal-placental unit, or indicated cesarean delivery for non-reassuring fetal testing or suspected uterine rupture" (p. 136).
- 2004 Bujold et al. "a defect that involved the entire thickness of the uterine wall, including the overlying peritoneum, with extrusion of intrauterine contents into the peritoneal cavity that required operative intervention" (p. 1114 for 2004).
- 2004 Landon, Hauth, Leveno, & Spong "a disruption or tear of the uterine muscle and visceral peritoneum or a separation of the uterine muscle with extension to the bladder or broad ligament" (p. 2583).
- 2005 Macones et al. "separation of the uterine scar (determined at laparotomy), immediately preceded by either a nonreassuring fetal heart rate pattern (determined by the treating obstetrician) or by signs/symptoms of acute maternal bleeding (SBP <70 mmHg, DBP <40 mm Hg, HR >120) or by the presence of blood in the maternal abdomen at the time of laparotomy" (p. 1657).

|      |                   |  |
|------|-------------------|--|
| 2006 | Landon et al.     | "disruption of the uterine muscle and visceral peritoneum or a uterine muscle separation with extension to the bladder or broad ligament found at the time of cesarean delivery or laparotomy following VBAC" (p. 13)  |
| 2007 | Stamilio et al.   | "a uterine scar separation determined at laparotomy that was preceded by a nonreassuring fetal heart rate pattern, maternal signs or symptoms of acute blood loss, or hemoperitoneum. This definition excludes asymptomatic uterine dehiscence" (p. 1077).                             |
| 2008 | Shipp et al.      | Uterine rupture was defined as "a symptomatic disruption involving all layers of the prior cesarean scar, accompanied by hemorrhage, hysterectomy, bladder damage, extrusion of the fetus or placenta, suspected uterine rupture, or non reassuring fetal heart rate testing." (p.130) |
| 2010 | Bujold & Gauthier | "complete separation of the uterine scar, resulting communication between the uterine and peritoneal cavities and requiring emergency cesarean delivery or postpartum laparotomy" (p. 1004).   |

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Uterine rupture is known to occur during labor in women with no uterine scar.

The incidence ranges from 1/5700 deliveries to 1/20,000 (Dow et al., 2009; Porrecco et al., 2009). Uterine rupture in an unscarred uterus is associated with obstructed labor and the use of inductive agents (Dow et al., 2009; Porrecco et al., 2009). However, it is usually attributed to a TOLAC, and is associated with significant risk of perinatal morbidity and mortality (Guise et al., 2010). Concerns regarding the risk of uterine rupture have been identified by patients, health care providers, hospitals, and policy makers alike (Guise et al., 2010). Furthermore, these concerns can contribute to tocophobia (a fear of birth) in women, who will then turn to interventions to decrease this perceived risk (Jordan & Murphy, 2009). Decision-making, informed consent, and access to VBAC for women and health care providers is ultimately affected by the fear of uterine rupture.

The breadth of research regarding uterine rupture is extensive. There are numerous variables that have been identified as increasing a woman's risk of uterine rupture when a TOLAC is attempted. These include maternal age, method of closure, interdelivery interval, fetal weight, number of cesareans, type of incision, febrile episodes during cesarean recovery, use of inductive agents, and cervical ripening. Each of these variables will be discussed in upcoming sections, not only to inform the reader of the risks that have been identified, but to identify the sources of fear and concern regarding VBAC that have resulted in decreased support of VBAC. It is important to note that due to the low incidence of uterine rupture, the sample sizes are often small. Table 8 outlines the research reviewed for this section.



Table 8

*Variables Associated With Uterine Rupture*

| 1 <sup>st</sup> Author<br>Year | Variable studied                                      | Design        | Purpose   | Total<br><i>n</i>   | Findings   |
|--------------------------------|---|---------------|---|---|--|
| Miller<br>1994                 | Number of prior<br>CS                                 | Retrospective | To study differences in<br>uterine rupture rate<br>based on number of<br>prior CS                 | 17,322 women<br>with at least one<br>prior CS                                       | Uterine rupture occurred in 95 (.7%) women<br>with a prior CS, and occurred more often in<br>women with more than one cesarean (1.7%<br>vs. 0.6%).   |
| Naef<br>1995                   | Scar type   | Retrospective | To study the perinatal<br>outcomes involved<br>with a low vertical CS                             | 174 women with<br>a prior low<br>vertical CS<br>attempted a<br>TOLAC                | There were 2 (1.1%) uterine ruptures, with<br>no adverse maternal or fetal outcomes.<br>VBAC rate: 83%   |
| Shipp<br>1999                  | Scar type   | Retrospective | To determine the<br>difference in uterine<br>rupture rates between<br>LTCS and low vertical<br>CS | 2,912 women<br>with a prior<br>LTCS<br>377 women with<br>a prior low<br>vertical CS | LTCS=0.96% rate of uterine rupture<br>Low vertical=0.8% rate of uterine rupture<br>VBAC rate: LTCS: 56.4%<br>VBAC rate: low vertical CS: 67.4%   |
| Zelop<br>1999                  | Cervical<br>ripening/Induced<br>or augmented<br>labor | Retrospective | To examine the risk of<br>uterine rupture during<br>augmentation or<br>induction of labor.        | 2,774 women<br>with one prior<br>cesarean<br>delivery and no<br>vaginal delivery    | Women who spontaneously labored had a<br>statistically significant ( $p=.001$ ) lower rate<br>of uterine rupture (0.7%) compared with<br>those who were induced (2.3%). Women<br>who received prostaglandin gel were more<br>likely to experience uterine rupture (3.9%<br>vs. 0.9%, $P=0.02$ ). |

|                     |  |  |   |  |   |
|---------------------|--|--|---|--|---|
| Lydon-Rochelle 2001 | Cervical ripening/Induced or augmented labor | Retrospective-cohort, population based | To determine the impact of RCS, spontaneous labor, induction of labor, and use of prostaglandins on the rate of uterine rupture | 20,095 women having their first child by CS, and having a second during the study period | RCS associated with a uterine rupture rate of 0.16%, spontaneous labor uterine rupture rate was 0.52%, induction without prostaglandins rupture rate was 0.77%, and induction with prostaglandins rupture rate of 2.45%.  |
| Bujold, Bujold 2002 | Uterine incision closure                     | Observational cohort                   | Measure rate of uterine rupture based on closure method   | 1,980 women with complete medical records, one prior LTCS, and attempting TOLAC.         | Women grouped by single vs. double closure. Uterine rupture occurred in 9(7.3%) of those with a single layer closure, and 8(.5%) of those with a double layer closure. VBAC rate:76.3% (1510)   |
| Shipp 2002          | Maternal age                                 | Retrospective chart review             | Estimate whether or not maternal age is associated with uterine rupture.  | 3,015 women who experienced a failed TOLAC   | Women under the age of 30 were less likely to experience uterine rupture than those over the age of 30 (5, .5% vs. 27, 1.4%).   |
| Durnwald 2003       | Uterine incision closure                     | Retrospective chart review             | Investigate risks and benefits of a single layer closure  | 532 women who had a prior LTCS, attempting TOLAC   | There were 182 women with single layer closure, and 340 with double layer closure. VBAC rates were similar between single (123, 68.1%) and double layer (220, 64.7%) closure groups. Single layer closure was associated with an increased rate of uterine dehiscence (3.5% vs 0.7%, $P = .046$ ) |
| Shipp 2003          | Febrile episode during cesarean recovery     | Nested, case control design            | To determine if a febrile episode during cesarean recovery was related to uterine rupture in subsequent TOLAC                   | 4,383 sets of records<br>21 involved uterine rupture                                     | Postpartum fever was noted in 38.1% (8) of those who experienced uterine rupture, compared with 15.5% (13) among the controls( $p=0.03$ ). Intrapartum fever was noted in 19% (4) of those that experienced uterine rupture, compared with 10.7% (9)  |

|                  |   |   |  |  |   |
|------------------|---|---|--|--|---|
| Bujold<br>2004   | Maternal age  | Retrospective<br>cohort                                     | To examine whether or<br>not maternal age<br>influences TOLAC<br>outcomes                                  | 2,493 women<br>with previous<br>LTCS and<br>undergoing<br>TOLAC  | Women over the age of 35 were more likely<br>to have a failed TOLAC, but not more likely<br>to experience uterine rupture compared with<br>their younger counterparts.  |
| Landon<br>2004   | Cervical<br>ripening/Induced<br>or augmented<br>labor | Prospective<br>observational                                | Compare outcomes<br>associated with<br>TOLAC and RCS   | 17,898 women<br>elected TOLAC<br>15,801 elected<br>RCS   | There were 124 uterine ruptures in the<br>TOLAC group, and none in the ERCS.<br>Uterine rupture rates for those in<br>spontaneous labor, induced, and augmented<br>were 0.4%, 0.9%, and 1.0% respectively.  |
| Landon<br>2006   | Number of prior<br>CS                                 | Prospective<br>multicenter<br>observational                 | To examine the risk of<br>uterine rupture during<br>TOLAC for women<br>with single or multiple<br>prior CS | 45,988<br>17,898 elected a<br>TOLAC<br>975 women with<br>multiple prior<br>CS<br>16,915 with one<br>prior CS | Uterine rupture rate with one prior CS was<br>.7% compared with .9% associated with<br>more than one prior CS, but was not<br>statistically significant ( $p=.37$ ). VBAC rate:<br>73%.   |
| Stamilio<br>2007 | Interpregnancy/<br>interdelivery<br>interval          | Secondary<br>analysis of a<br>retrospective<br>cohort study | To examine the impact<br>of time interval<br>between pregnancies<br>on the rate of uterine<br>rupture      | A cohort of 13,<br>331 women<br>from an initial<br>group of 25,005   | Uterine rupture occurred in 118 (.9%)<br>women with an interpregnancy interval of<br>more than 6 months, compared with 8<br>(2.7%) of those with an interval of less than<br>6 months (adjusted OR: 2.66 (1.21–5.82))<br>VBAC success rate was 77%. |

**Scar type.** There are several types of cesarean section that are performed, and each has its own advantages and disadvantages. Decisions regarding the type of incision that is used may be based on fetal position, placental location, gestational age, and indication for the cesarean.

The LTCS involves the incision of the lower uterine segment. Currently, it is the most commonly performed cesarean section, for it is easier to repair, bowel or omentum is less likely to adhere to the scar, and it is less likely to rupture in a subsequent pregnancy (Cunningham et al., 2010b).

The “low-vertical” cesarean section, also known as a low-segment vertical cesarean section, involves the vertical incision of the lower uterine segment. This technique may be utilized for breech or transverse fetal presentations (Cunningham et al., 2010b).

A classical cesarean section involves making a vertical incision, starting as low as possible in the uterus, and extending high enough to allow for delivery. This type of incision may be made in instances when there is a transverse lie, multiple gestation, maternal morbid obesity, invasive cervical cancer, a densely adherent bladder, placenta previa that makes it difficult to deliver through a low transverse incision, a need to deliver emergently, and/or extreme prematurity (Cunningham et al., 2010b). Generally, these incisions are avoided.

There are instances in which a low transverse incision is initially made and then the incision is vertically extended. This is known as a “T” shaped incision. These decisions are made by the surgeon, but impact future childbearing options. This incision may be used when there is malpresentation of the fetus, a lower uterine segment that is

not well developed enough to assure a safe delivery, or if there are fibroids and adhesions that restrict access to the lower uterine segment (Patterson et al., 2002).

The risk of uterine rupture is dependent on the type of cesarean incision that was performed. It is believed that incisions that extend vertically into the uterine muscle, such as the classical or “t” shaped incision, result in a rupture rate of 4-9% (Landon, 2008). However, because women with these types of incisions are not considered appropriate TOLAC candidates, there are no recent studies involving women with these incisions.

It has been suggested that the currently quoted uterine rupture rates in women following a classical cesarean are inaccurate and exaggerated, as they are based on studies from 50-60 years ago (DeCosta, 2005). In a historical literature review regarding TOLAC in women with previous classical cesareans, DeCosta (2005) closely examined an influential study by Dewhurst (1957). Dewhurst was known to not be supportive of VBAC following a classical cesarean section (DeCosta, 2005). In 1956, Dewhurst published his own findings regarding uterine rupture (DeCosta, 2005). The sample included 68 women with a history of 103 classical cesarean sections, and 16 women who had undergone both low transverse and classical cesarean. The uterine rupture rate reported for this group was 6%. However, one significant flaw in this study was that the number of prior cesareans was not controlled for as a confounding variable. As will be discussed in the following section, increasing numbers of cesareans have been linked to an increased risk of uterine rupture, which very likely impacted the reported rate of uterine rupture. A subsequent publication pooling the results of 6 other uterine rupture studies together reported a uterine rupture rate after a classical cesarean as being 8.9%

(Dewhurst, 1957). Again, the study did not control for the number of prior cesareans.

This flawed study has been used to guide practice which exists to this day.

In order to determine the difference in uterine rupture rates between women who had experienced either a low transverse or a low vertical uterine incision, a retrospective chart review was performed by examining the records of 3,289 women who experienced cesarean delivery between the years of 1984-1996 (Shipp et al., 1999). Women who had a previous classical or “t” shaped incision were excluded, as were those with undocumented incisions, or those who had experienced both LTCS and low-vertical cesarean section. Uterine disruptions were categorized as either being asymptomatic dehiscences or symptomatic rupture.

Of the 2,912 women with a prior LTCS, 28 (1.0%) experienced uterine rupture. Of the 377 women who had a prior low vertical cesarean, 3 (.8%) experienced uterine rupture. The authors concluded that there was not a significant difference in the rate of uterine rupture based on these two incision types. One limitation of this study involves the lack of clarity in differentiating subjects with a low vertical incision versus a classical incision.

Naef et al., (1995) studied the maternal and perinatal outcomes involved with a prior low vertical cesarean. Over a 10-year period in one tertiary hospital, 1,137 women underwent a low vertical cesarean section, and 262 were subsequently delivered of 322 infants. Of the 174 (54%) that attempted a TOLAC, 144 (83%) experienced a successful VBAC. Uterine rupture occurred in 2 (1.1%) during TOLAC, and neither resulted in adverse maternal or fetal sequelae. Although this study was limited by an unclear

definition of low vertical incision, the findings suggested that both scar types are low risk for TOLAC.

Currently, a TOLAC is contraindicated in women with a prior classical or T-incision. However, it is worth noting that this contraindication is based upon potentially flawed research. Due to current practice recommendations, and an increased risk of uterine rupture, women with these prior incisions are not able to attempt TOLAC, eliminating this as an area of further research.

***Number of prior cesareans.*** The findings of the scientific literature are conflicting regarding the risk of uterine rupture after more than one cesarean section (Landon, 2010). However, this conflict may lie with variables not controlled for, as well as the statistical significance of the increased uterine rupture rate.

A retrospective chart review study by Miller et al. (1994) was undertaken. This study revealed differences in uterine rupture rates between women who had one prior cesarean versus those that had two or more. There were 164,815 births at one hospital during the years of 1983-1992. Of these, 17,322 (10.5%) were to women who had at least one prior cesarean. Medical records were excluded if the patient had a prior classical cesarean section, previous uterine rupture, known unrepaired uterine dehiscence, or contraindications to labor. Twin gestations and breech presentations were not considered contraindications to labor, and were included in this study.

Uterine rupture occurred in 95 (.7%) women who attempted a TOLAC and in 22 (.5%) who did not. Uterine rupture occurred more frequently in those that had two or more cesareans (1.7%), compared with those that had one (.6%). The authors did not control for the use of pitocin, the use of cervical ripening agents, maternal age, and there

was no information regarding the indication for the primary cesarean birth. This study concluded that a TOLAC was an acceptable alternative to a RCS delivery, and could be used to substantially decrease the cesarean rate. Furthermore, a TOLAC was found to be a reasonable option for women with a history of multiple cesarean sections, as long as they understood the increased risk of uterine rupture.

Landon et al. (2006), examined the risk of uterine rupture during a TOLAC for women with single or multiple prior cesarean sections using a prospective multicenter (19 academic institutions) observational study as a part of the NICHD Maternal-Fetal Medicine Units Network from 1999-2002. All women with a singleton pregnancy of at least 20 weeks gestation, or with a birth weight of at least 500 grams, and a history of cesarean section were included. The study sample size of 17,000 was estimated by assuming a uterine rupture rate of .5% in women with one prior cesarean section, and assuming the likelihood that 10-15% of women with multiple prior cesareans would be attempting a VBAC. There were 45,988 women with prior cesareans and subsequent singleton pregnancies that were a part of this study. Of these, 17,898 (39%) elected a TOLAC. The findings of the study are presented in Table 9. While this demonstrates an increased rate of uterine rupture in women with more than one prior cesarean, it was not statistically significant ( $p=.37$ ).



Table 9

*Rate of VBAC and Risk of Uterine Rupture by Number of Previous Cesareans*

| Number of Prior Cesareans | TOLAC rates from total sample | Rate of VBAC             | Rate of Uterine Rupture |
|---------------------------|-------------------------------|--------------------------|-------------------------|
| One                       | 48%<br>(n=16,915)             | 74%<br>(n=12,490)        | .7%<br>(n=115)          |
| Multiple                  | 9%<br>(n=975,<br>P<.001)      | 66%<br>(n=648, P<.001)   | .9%<br>(n=9)            |
| Two                       |                               | 67%<br>(n=584)           |                         |
| Three                     |                               | 63%<br>(n=53)            |                         |
| Four                      |                               | 55%<br>(n=11,<br>P<.001) |                         |

Adapted from "Risk of Uterine Rupture with a Trial of Labor in Women With Multiple and Single Prior Cesarean Delivery," by M.B. Landon, C.Y. Spong, J.C. Hauth, L.S. Bloom, M.W. Varner, A.H. Moawad, ... and S.G. Gabbe, 2006, *Obstetrics & Gynecology*, 108(1), 12-20.

These findings reveal that women with more than one cesarean can successfully and safely experience VBAC. In addition, for women with more than one cesarean, a prior vaginal delivery should not be required in order to attempt a TOLAC. It is appropriate to consider women with two prior cesareans as candidates for TOLAC, as this study showed that their success rate is similar, and their risk of uterine rupture is not statistically significant (ACOG, 2010a).

There were limitations to this study, and these were identified by the authors. The results were not examined for institutional differences. This might have shown variations in practice and success rates. Women who elect a TOLAC after numerous cesareans may have unique personal characteristics that would be difficult to identify and control for in

other studies. In addition, prior uterine closure method was not controlled for, and long-term health outcomes were not studied.

**Maternal age.** Advanced maternal age, defined as being over the age of 35, has been identified as being a risk factor for cesarean section and for failed TOLAC. To estimate whether or not maternal age is associated with uterine rupture during a TOLAC, a retrospective study was undertaken, utilizing the medical records of 3,015 women who experienced failed TOLAC during the years of 1984-1996 (Shipp et al., 2002).

The study criteria were records of women who had one prior cesarean section, no prior vaginal deliveries, and a singleton pregnancy. Women had prior low transverse, low vertical, or unknown uterine incisions. The researchers did not control for the type of prior incision, which significantly impacts the risk of uterine rupture. Women under the age of 30 were more likely to have experienced a low vertical incision (n=113, 10.6%) than the women 30 years and older (n=151, 7.7%). There were 1,065 women under the age of 30, and 1,950 that were 30 years or older. Overall, there were 32 uterine ruptures.

A logistic regression model was used controlling for the potential confounding variables of birth weight, interdelivery interval, augmentation, and induction. Five women under the age of 30 (.5%) experienced uterine rupture, and 27 (1.4%) women 30 years and older experienced uterine rupture. While the authors stated that incorporating the uterine scar type into the regression model did not change the odds ratio for rupture, there was nearly triple the risk of rupture in the older women who more likely had uterine scars other than LTCS. Though the overall risk of uterine rupture was low in this study, it was significantly increased in those women over the age of 30. One factor that was not discussed was whether or not the authors had access to the prior cesarean records to

determine method of closure. In the following section, the method of closure and its relationship to uterine rupture will be discussed. Depending on practice changes that were occurring during the 12 year time span, it is possible that those women over the age of thirty may have had a single layer closure, which has been associated with a higher risk of uterine rupture.

Another study was undertaken to examine whether or not maternal age influences the outcomes of TOLAC (Bujold et al., 2004). A cohort study of 2,493 women who had a previous LTCS and were undergoing a TOLAC was performed. Women were divided into three groups based on age. These categories were under the age of 30, between 30-34 years, and 35 years and older. In addition, women were categorized on whether or not they had experienced a prior vaginal delivery. There were 1,750 women without a prior vaginal delivery, and 743 women with a prior vaginal delivery. There were 29 uterine ruptures (1%), with 26 of them occurring in women who had not experienced vaginal birth in a prior pregnancy.

The authors found that while women over the age of 35 at the time of delivery were more likely to have a failed TOLAC (regardless of prior birth modality), they were not more likely to experience uterine rupture than their younger counterparts. However, this study did find a correlation between uterine rupture and single closure, as well as involving an inter-delivery interval of less than 24 months. These variables will be discussed in following sections.

***Method of uterine incision closure.*** When a LTCS uterine incision is closed, it is typically done in one or two layers (Cunningham et al., 2010). The single closure method has been associated with a shorter operative time and comparable recovery (Bujold,

Bujold, Hamilton, Harel, & Gauthier, 2002). In the last decade, research has shown that women who have had a single layer uterine closure are at an increased risk of uterine dehiscence and uterine rupture (Bujold et al., 2002; Durnwald & Mercer, 2003).

An observational cohort study of women undergoing a TOLAC at one tertiary level center was undertaken between the years of 1988-2000 (Bujold et al., 2002). Eligibility criteria for the study included having one prior LTCS. During the time of this study, there were 48,470 deliveries in this center, and 4,627 women who had a prior LTCS, 2,142 (46.3%) of whom attempted a TOLAC. VBAC was successful in 1,510 (76.3%). Of these 2,142 women, complete medical records that included the operative report from their prior cesarean section were available for 1,980 (92.4%). Operative reports and medical records were reviewed by two researchers.

Single layer closure had been used in 489 women, and there were 15 (3.1%) uterine ruptures in this group. Double layer closure had been utilized in 1491 women, and there were 8 (.5%) uterine ruptures in this group. The authors also examined the rates of uterine dehiscence at the time of the cesarean delivery. There were 9 (7.3%) cases of dehiscence in 123 women who had a previous single layer closure and 10 (3.1%) cases of dehiscence in 324 women who had a previous double layer closure. The authors recommended further study of the relationship between closure method and risk of subsequent uterine rupture, and the use of a double layer closure.

Durnwald and Mercer (2003) performed a retrospective study of all nulliparous women delivered of their first and second singleton liveborn infants between 1989-2001. All deliveries occurred in the same facility. Inclusion criteria included the first delivery occurring by LTCS. Exclusionary criteria included any extension of the uterine incision,

previous myometrial surgery, or delivery of either pregnancy prior to 24 weeks. There were 768 women that were studied. Maternal and newborn medical records from the 1,536 deliveries were included. Of the 768 women that were studied, 532 attempted TOLAC. There were 182 women who had a single layer closure in their index pregnancy, and 340 women that had a double layer closure. VBAC rates were similar between the two groups, occurring in 68.1% (123) of those women with a single layer closure, and in 64.7% (220) of those with a double layer closure.

Unlike the study by Bujold et al. (2002), 99.2% of the cesareans were closed with polyglactin 910 suture. This may be relevant, as the authors explained the polyglactin retains its tensile strength for 7-10 days, and is degraded by hydrolysis. The chromic catgut loses half of its tensile strength within 7-10 days, is degraded by proteolytic enzymes, and may break down more rapidly in the presence of infection. There were no uterine ruptures in the single closure group in this study, and the authors stated that this might have been the reason. There were four uterine ruptures encountered in the double closure group. Uterine windows, or dehiscences, were present in 2.8% (5 of 182) of the single closure group, .6% (2 of 349) of the double closure group, and were found at the time of cesarean section. The authors noted that only 31% of women who had a successful VBAC had their previous incision palpated, so it is possible that there were others that were not found. Double layer incision closure should be recommended for those women who may wish to attempt a TOLAC in a future pregnancy.

Although increased risk of uterine rupture and dehiscence has been found in those women who underwent a single layer closure, this issue is not consistently addressed in all of the literature regarding uterine rupture. This is likely due to the changes in practice

over time.. One might conclude that some of the higher rates of uterine rupture reported in earlier studies, as well as the discrepancy in the reported rates, may have been associated with these specific differences in closure.

***Interdelivery/interpregnancy interval.*** A short interdelivery/interpregnancy interval has been implicated in an increased risk of uterine rupture. However, the use of the word “short” is inconsistently defined in the literature. Attention must be given to the terms inter-delivery (time between deliveries), and inter-pregnancy (time between previous delivery and subsequent pregnancy). It is thought that this increased risk of uterine rupture is due to the length of time that is necessary for complete healing of the uterine scar. Magnetic resonance imaging (MRI) of uteri following cesarean section have shown that the maturation period of myometrial tissue is approximately 3 months, but that total healing and involution occur at approximately 6 months post-delivery (Dicle, Kucukler, & Pirnar, 1997).

A study of the impact of a short interpregnancy interval on the incidence of uterine rupture was undertaken (Stamilio et al., 2007). This study was a secondary analysis of a multi-center, retrospective cohort study utilizing the records of 25,005 women who had prior cesareans. There were 17 hospitals that participated during the years of 1995-2000. Patients were excluded if they had a prior classical cesarean, an unknown uterine scar, or any type of fetal anomaly.

The 25,005 women were divided into two cohorts. One cohort included 13,706 (55%) women who decided to undergo a TOLAC. In this cohort 2.7% of the records did not contain inter-pregnancy interval information, and were excluded. The other cohort included 13,331(45 %) women. Each cohort was further described in the terms of both

inter-pregnancy intervals and uterine rupture risk, and were categorized as being less than 6 months (n=286), or more than 6 months (n=13,045).

Uterine rupture occurred in 118 (.9%) of women who had an inter-pregnancy interval of greater than 6 months. Uterine rupture occurred in 8 (2.7%) of the women who had an inter-pregnancy interval of less than 6 months. Women with an inter-pregnancy interval of less than 6 months were also three times more likely to require a postpartum blood transfusion following the 2<sup>nd</sup> delivery. This study shows an increased risk of uterine rupture with an inter-pregnancy interval of less than six months.

Bujold & Gauthier (2010) performed a secondary analysis of a retrospective cohort study, examining the inter-delivery interval and uterine rupture rates of 1,768 women who delivered at one facility between 1987 and 2004. Cases where women had a prior classical, T-inverted, J shaped cesarean section, two or more prior cesareans, or having a previous myomectomy were excluded from analysis. Women who had a VBAC (term or preterm) between their cesarean section and the current pregnancy were also excluded. Inclusion criteria were singleton, term pregnancies undergoing a TOLAC. Uterine rupture was defined as a complete disruption of the uterine scar, requiring emergency cesarean delivery or postpartum laparotomy.

Of the 1,768 women, 1,323 (74.8%) had an inter-delivery interval of 24 months or more, 257 (14.5%) had an interval of 18-24 months, and 188 (10.6%) had an interval of less than 18 months. An inter-delivery interval of 24 months or more was associated with a 1.3% (n=17) risk of uterine rupture. An inter-delivery interval of 18-24 months was associated with a 1.9% (n=5) risk of uterine rupture. However, the risk of uterine rupture with an inter-delivery interval of less than 18 months was 4.8% (9). This study was

limited by the relatively small sample size of those that experienced uterine rupture, the fact that it was retrospective, and by the long interval of time that was examined. During the years of 1987-2004, there were numerous changes in practice including (but not limited to) closure method, the use of misoprostol for cervical ripening/induction, and increased rates of induction of labor. As discussed in this chapter, these factors have impacted the rate of uterine rupture. The authors recommended that a TOLAC still be offered to women who had a delivery interval of less than 18 months, but that their care include counseling regarding the increased risk of uterine rupture.

***Febrile episode during cesarean recovery.*** Endomyometritis, particularly before the advent of routine pre-incision antibiotic prophylaxis, is commonly encountered after cesarean. Endomyometritis is an infection of the uterine layers following cesarean section, and it impacts the healing of the surgical wound. Fever is a common symptom of endomyometritis (Shipp, Zelop, Cohen, Repke, & Liebermann, 2003). Routine pre-incision antibiotic administration is known to be beneficial to mothers, and is recommended before cesarean section to prevent maternal post operative infection (ACOG, 2010c; Smaill & Gyte, 2010). According to the Cochrane Collaboration, the impact of this practice on infants and on overall antibiotic resistance is not entirely clear, and is an area in need of further study (Smaill & Gyte, 2010).

The incidence of uterine rupture during a TOLAC in women who had experienced a fever in their prior cesarean recovery period was studied using a nested, case-control design (Shipp et al., 2003). A database including all women who experienced a TOLAC during a twelve-year period in a single level-three hospital was analyzed. There were 4,383 sets of records included in the study, 21 (0.48%) of which involved uterine rupture.



Each case involving uterine rupture had 4 controls that were matched by year of delivery, number of prior cesareans, induction in the index pregnancy, and prior vaginal delivery. If the patient had more than one prior cesarean section, the records from the last cesarean were reviewed. The closure method (single or double layer), use of antibiotics, and postpartum WBC counts were included in data collection. Fever was defined as a temperature above 38C, and its timing during the cesarean hospitalization was also considered.

Conditional logistic regression analysis was performed taking into account the matched sets in a case control study. After comparing for fever and uterine rupture, the cases were controlled for maternal age, and birth weight of 4000 grams or more. The rate of postpartum fever was 38.1% (8) in 21 women who experienced uterine rupture in the subsequent TOLAC compared with 15.5% (13) among the 84 controls ( $p=0.03$ ). Intrapartum fever was noted in 19% (4) of the women who experienced a uterine rupture with subsequent TOLAC compared with 10.7% (9) of the controls. The 21 women who experienced uterine rupture were more likely to be over the age of 30 (90.5%) than the 84 controls (53%). The findings of this study are limited by the retrospective nature of the data but suggested that the presence of fever during the intrapartum and/or postpartum period of a cesarean delivery increases the risk of uterine rupture in a subsequent TOLAC.

***Cervical ripening/induced or augmented labor.*** Cervical ripening, the process by which the cervix is softened, effaced, and readied for induction of labor, can be achieved by pharmacologic or non-pharmacologic methods (Simpson, 2009). Pharmacologic method involves the application of prostaglandin preparations (creams, gels, inserts, or

tablets) to the cervical area. Non-pharmacologic methods may involve sweeping the membranes, amniotomy, or the use of mechanical dilators. The use of pharmacological prostaglandin preparations for cervical ripening has been implicated in an increased risk of uterine rupture in women attempting VBAC (Zelop et al., 1999; Lydon-Rochelle, Holt, Easterling, & Martin, 2001).

Induction of labor is the process of stimulating uterine contractions before the spontaneous onset of labor (Simpson & Creehan, 2008). Augmentation is the process of stimulating contractions when spontaneous contractions have not resulted in progressive cervical dilation or fetal descent (Simpson & Creehan, 2008). A synthetic form of oxytocin, known by the trade name of Pitocin, is used for induction or augmentation of labor (Simpson, 2009).

As discussed previously in this chapter, induction of labor may be done for many reasons, ranging from provider/patient convenience to the presence of a medical complication of pregnancy. Induction of labor has been correlated to an increased risk of cesarean section. Augmentation and induction of labor using pharmacologic methods have also been correlated to an increased risk of uterine rupture (Zelop et al., 1999; Lydon-Rochelle et al., 2001; Landon et al., 2004).

In order to examine the risk of uterine rupture during augmentation or induction of labor during TOLAC, the medical records of 2774 women were retrospectively examined (Zelop et al., 1999). This sample was limited to women with one prior cesarean delivery, and no previous vaginal deliveries. For inclusion into this study, the previous cesarean delivery must have been low transverse, low vertical, or an unknown incision type. The authors defined induction of labor as regular contractions after the use of

prostaglandin gel and/or oxytocin. Augmentation was defined as the use of oxytocin after the onset of spontaneous labor, or oxytocin administration after establishment of regular contractions with prostaglandin gel. The participants were divided into two groups based upon labor onset being spontaneous or induced. The type of cesarean section distribution was similar between these two groups as shown in Table 10.

Table 10

*Distribution of Participants By Onset of Labor and Type of Prior Cesarean*

| Onset of labor        | Previous LTCS | Previous Low<br>Vertical | Unknown   |
|-----------------------|---------------|--------------------------|-----------|
| Spontaneous<br>N=2214 | 1771 (80%)    | 198(8.9%)                | 245 (11%) |
| Induced<br>N=560      | 438 (78%)     | 45(8%)                   | 77(13.8%) |

Adapted from "Uterine Rupture During Induced or Augmented Labor in Gravid Women With One Prior Cesarean Delivery," by C. Zelop, T. Shipp, J. Repke, A. Cohen, A. Caughey, and E. Lieberman, 1999, *American Journal of Obstetrics and Gynecology*, 181(4), 882-886.

Uterine rupture occurred in a total of 29 patients. Of those that experienced uterine rupture, 25 (86.2%) had a prior LTCS, 3 (10.3%) had a prior vertical cesarean incision, and 1(3.4%) had an unknown scar. The rate of uterine rupture was reported as outlined in Table 11. There was also a statistically significant rate of rupture among women who received prostaglandin gel (3.9%) compared with those who did not receive prostaglandin gel (0.9%,  $P = .02$ ). Women who had a spontaneous onset of labor and did not need oxytocin augmentation had the lowest rate of uterine rupture, while those that had labor induced with both prostaglandin gel and oxytocin had the highest rate

of uterine rupture. The authors concluded that induction of labor is associated with a significant risk of uterine rupture when compared with spontaneous labor ( $p=.001$ ).

Table 11

*Uterine Rupture Rate by Onset of Labor and Use of Inductive Agents*

| Labor                                       | Sample size | Rate of uterine rupture |
|---|-------------|-------------------------|
| Spontaneous Onset                           | 2214        | .7% (16)                |
| No augmentation                             | 1142        | 0.4% (5)                |
| Oxytocin augmentation                       | 1072        | 1% (11)                 |
| Induction of labor                          | 560         | 2.3% (13)               |
| Prostaglandin gel                           | 35          | 2.9%(1)                 |
| Oxytocin                                    | 458         | 2%(9)                   |
| Prostaglandin gel and oxytocin induction    | 67          | 4.5%(3)                 |
| Prostaglandin gel and oxytocin augmentation | 17          | 0                       |

Adapted from "Uterine Rupture During Induced or Augmented Labor in Gravid Women With One Prior Cesarean Delivery," by C. Zelop, T. Shipp, J. Repke, A. Cohen, A. Caughey, and E. Lieberman, 1999, *American Journal of Obstetrics and Gynecology*, 181(4), 882-886.

A population based, retrospective cohort analysis was performed using data from the Washington State Birth Events record from January 1, 1987-December 31, 1996 (Lydon-Rochelle et al., 2001). A cohort of 20,095 women having their first child by cesarean, and then having a second child during this time period was formed. Based on ICD-9 codes, the 2<sup>nd</sup> deliveries were classified as repeat cesarean-no labor (6,980 women, 34.7%), induction of labor without prostaglandins (1,960 women, 9.8%), induction of labor with prostaglandins (366 women, 1.8%), and spontaneous labor (10,789 women,

53.7%). The occurrence of uterine rupture was noted by the presence of an ICD-9 code. Of note, there were 272 women with a prior low vertical incision in this cohort, and none experienced uterine rupture. The rate of uterine rupture associated with induction, labor, and delivery route is outlined in Table 12.

Table 12

*Rate of Uterine Rupture and Induction, Labor and Delivery Route*

| Induction, Labor, and Delivery Route                   | Rate of Uterine Rupture |
|--|-------------------------|
| Cesarean without labor<br>(n=6980, 34.7%)              | 11 ( 1.6 per 1000)      |
| Spontaneous labor<br>(n=10789, 53.7%)                  | 56 (5.2 per 1000)       |
| Induction without<br>prostaglandins<br>(n=1960, 19.8%) | 15 (7.7 per 1000)       |
| Induced with<br>prostaglandins<br>(n=366, 1.8%)        | 9 (24.5 per 1000)       |

Adapted from "Risk of Uterine Rupture During Labor Among Women With a Prior Cesarean Delivery," M. Lydon-Rochelle, V. Holt, T. Easterling and D. Martin, 2001, *The New England Journal of Medicine*, 345(1), 3-8.

This study had several limitations. First, the authors did not define what constituted a definition of uterine rupture vs. dehiscence, nor was it differentiated by the ICD-9 codes. Uterine dehiscence may have been present at the time of the RCS without labor, but coded as a uterine rupture. Second, this study was limited to information derived from birth records. The authors stated that there had been a prior study performed showing the accuracy of cesarean coding using this data source (Washington State Birth Events), but this study was from a decade earlier. Third, it was not possible to identify the type of prostaglandin preparation that was used. During the last year of this study,

misoprostol (Cytotec) was being used for cervical ripening in the United States. Due to an association between misoprostol (Cytotec) use and uterine rupture, it was later recommended that it not be used in women with prior uterine surgery (Wing, Lovett, & Paul, 1998). Nonetheless, this study suggests a relationship between the use of inductive agents and uterine rupture, with the greatest risk being associated with the use of prostaglandins.

A prospective observational study was conducted over 4 years at 19 academic medical centers. Outcomes associated with a TOLAC were compared with those of an ERCS (Landon et al., 2004). There were 17,898 women who elected a TOLAC, and 15,801 women who had an ERCS without labor. All women with a prior cesarean delivery who had a singleton pregnancy over 20 weeks, or a birth weight of at least 500 grams were included.

There were 124 uterine ruptures in the group who chose a TOLAC, resulting in a rupture rate of .7%. Women who had augmented labor experienced a uterine rupture rate of .9% (n=52), and women with induced labor had a uterine rupture rate of 1% (n=48). The authors noted that of those with induced labors, the use of prostaglandins and pitocin resulted in a uterine rupture rate of 1.4% (n=13). There were no uterine ruptures in the group that was induced solely with prostaglandins. With oxytocin alone for induction of labor, the uterine rupture rate was 1.1% (n=20). However, for those women who labored spontaneously, there was a significant decrease in risk of uterine rupture. There were 24 uterine ruptures in 6,685 women who labored spontaneously, which resulted in a uterine rupture rate of 0.4%. The authors concluded that the risk of uterine rupture is increased

with labor induction, but did not find the same correlation with the use of prostaglandins and uterine rupture. Table 13 outlines these findings.

Table 13

*Labor Characteristics and Rate of Uterine Rupture*

| Labor Characteristics  | Rate of Uterine Rupture |
|--|-------------------------|
| Spontaneous labor<br>(n=6,685)   | 0.4% (24)               |
| Augmented<br>(n=6009)  | 0.9% (52)               |
| Induced<br>(n=4708)  | 1.0% (48)               |
| Prostaglandin, with or without oxytocin<br>(n=926)                                   | 1.4% (13)               |
| With prostaglandins only<br>(n=227)  | 0                       |
| With no prostaglandins (mechanical<br>dilation with or without oxytocin)<br>(n=1691) | .9% (15)                |
| With oxytocin alone<br>(n=1864)  | 1.1% (20)               |
| Not classified<br>(n=496)  | 0                       |

Adapted from “Maternal and Perinatal Outcomes Associated With a Trial of Labor After Prior Cesarean Delivery,” by M.B. Landon, J. Hauth, K. Leveno, and C. Spong, 2004, *New England Journal of Medicine*, 351(25), 2581-2589.

There were several limitations to this study. First, the candidate selection did not control for parity or previous vaginal delivery. As discussed previously, a prior vaginal delivery results in an increased likelihood of VBAC, and a decreased rate of uterine rupture. Induction of labor and augmentation of labor were not defined or differentiated from each other. As demonstrated by Lydon-Rochelle et al.(2001), induction of labor has an increased rate of uterine rupture when compared with augmentation of labor. Third, there were 496 women whose labors were not “classified”, which constitutes nearly 3%

of the sample. None of them experienced uterine rupture. However, if these women were not “classified” because they had labored spontaneously and delivered, their inclusion would have resulted in a .1% decrease in the reported uterine rupture rate of spontaneously laboring women.

During the years of this study (1999-2002) by Landon et al. (2004), misoprostol (Cytotec) was no longer to be used in women with a previous uterine scar. In the study by Zelop et al. (1999), the data was from deliveries occurring between 1984-1996. During the last year of the study (Zelop et al., 1999), misoprostol (Cytotec) was being used in women with a prior uterine scar, and the authors were not able to differentiate between types of prostaglandin preparation. It is possible that some of the uterine ruptures occurred in women that received misoprostol (Cytotec), increasing the overall rate of uterine rupture in that study.

*Sequelae of uterine rupture.* As discussed previously, the fear surrounding the risk of uterine rupture has resulted in decreased support of VBAC. It is understood that uterine rupture is an uncommon event during a TOLAC, but the results may be catastrophic (El-Sayed et al., 2007). Many studies have attempted to predict the rate of uterine rupture rather than the morbidity associated with it (Guise et al., 2004). In the following section, maternal and fetal sequelae of uterine rupture are discussed. It is important to note that uterine rupture during a TOLAC is not consistently accompanied by poor maternal and fetal outcomes.

*Maternal sequelae.* Typically, maternal prognosis is much better than fetal prognosis after uterine rupture. In fact, uterine rupture is rarely fatal for mothers (Cunningham et al, 2010b).



A population based study of 117,685 deliveries occurring during the years of 1988-1999 was performed at one Israeli hospital (Ofir, Sheiner, Levy, Katz, & Mazor, 2003). The purpose of this study was to examine risk factors for uterine rupture and pregnancy outcome in those women who experienced uterine rupture.

Of the 42 women who experienced complete uterine rupture, 21 had a prior cesarean section. Therefore, the TOLAC uterine rupture rate was .21% compared to a 0.02% rate for women without a prior cesarean. The investigators provided no delineation between those that had ERCS, failed TOLAC, or VBAC. Women who experienced uterine rupture experienced postpartum hemorrhage, blood transfusion, and postpartum hysterectomy significantly more often than those that did not have uterine rupture. Despite the significant rate of complications found, there were no maternal deaths subsequent to uterine rupture in this sample. Table 14 outlines the maternal sequelae of uterine rupture.

Table 14

*Maternal Outcomes With and Without Uterine Rupture*

| Maternal Outcomes       | Uterine Rupture<br>(n=42) (0.035%) | No uterine rupture<br>(n=117, 643) |
|-------------------------|------------------------------------|------------------------------------|
| Postpartum hemorrhage   | 50%                                | 0.4%                               |
| Peripartum hysterectomy | 26.2%                              | 0.04%                              |
| Blood Transfusion       | 54.8%                              | 1.5%                               |

Adapted from "Uterine Rupture: Risk Factors and Pregnancy Outcome," by K. Ofir, E. Sheiner, A. Levy, M. Katz, and M. Mazor, 2003, *American Journal of Obstetrics & Gynecology*, 189(4), 1042-1046.

*Neonatal sequelae.* While there is an abundance of research regarding factors involved in uterine rupture, there is a scarcity of research regarding neonatal outcomes following uterine rupture (Bujold & Gauthier, 2002). Analysis of these outcomes remains a challenge due to small sample sizes (Martinez-Biargeet al., 2008). When neonatal sequelae of uterine rupture are studied, Apgar scores, neurological impact, incidence of hypoxic ischemic encephalopathy, and mortality rates are the most commonly investigated outcomes. However, the five minute Apgar score is examined as an outcome measure following uterine rupture, it is not a strong indicator for further morbidity (O'Donnell, Kamlin, Davis, Carlin, & Morley, 2006; Thorngren-Jerneck & Herbst, 2001). Each sequela will be briefly described in relationship to the VBAC literature.

A retrospective study of births from 1988-2000 was performed at a tertiary institution to examine fetal metabolic acidosis or death following uterine rupture (Bujold & Gauthier, 2002). The study included 2,233 women who experienced a TOLAC, 23 (1%) of whom experienced uterine rupture. Those cases involving uterine dehiscence were excluded. Apgar scores, umbilical cord blood pH, umbilical cord blood base deficit, admissions to the neonatal intensive care unit, the incidence of seizures, the incidence of hypoxic ischemic encephalopathy (HIE), and incidence of multi-organ system failure were examined. The researchers examined the records of 23 infants who experienced severe metabolic acidosis (defined as a cord blood pH of less than 7.0). The infants were placed into two groups. Group 1 (n=9) experienced severe metabolic acidosis, defined as a cord pH of less than 7.0. Group 2 (n=14) did not experience severe metabolic acidosis.

Group 1 had a median cord pH of 6.8 (range 6.38-6.91), a median base deficit of 22 (range 14-28), and a median 5 minute Apgar score of 4 (range 0-8). However the

corresponding information for group 2 was not reported by the authors. There were 6 incidents of placental or fetal extrusion associated with uterine rupture, and all 6 of these infants experienced severe metabolic acidosis. Three of these 6 infants were diagnosed with hypoxic ischemic encephalopathy.

The neonatal mortality rate in this study was 4% (n=1), and the extrusion rate was 26% (n=6). The authors concluded that placental or fetal extrusion was consistently associated with severe metabolic acidosis. While this study was valuable in demonstrating that uterine rupture is not consistently accompanied by poor fetal outcome, it was limited and biased by the exclusion of outcome information for neonates in group 2.

Ofir et al. (2003) examined risk factors and pregnancy outcomes following uterine rupture. Their findings regarding maternal outcomes were previously discussed in the maternal section. In their population-based study of 117, 685 singleton deliveries that occurred during 1988-1999, 42 women (.035%) experienced uterine rupture. Outcomes of infants born after uterine rupture were compared with those of infants whose deliveries were not complicated by uterine rupture and are presented in Table 15.

Apgar score information was used to compare outcomes between groups, and was a significant limitation of this study. Apgar scoring is not a reliable sole indicator for asphyxia and future morbidity (O'Donnell et al., 2006; Thorngren-Jerneck & Herbst, 2001). Therefore, these findings do not provide substantial evidence regarding the neonatal risks of VBAC.

Table 15

*A Comparison of Neonatal Outcomes With and Without Uterine Rupture*

| Outcomes           | Uterine Rupture<br>(n=42/0.035%) | No Uterine Rupture<br>(n=117, 643) |
|--------------------|----------------------------------|------------------------------------|
| Apgar 1 minute <5  | 17.9%                            | 2.4%                               |
| Apgar 5 minute <5  | 10.3%                            | .3%                                |
| Neonatal Mortality | 19%                              | 1.4%                               |

Adapted from "Uterine Rupture: Risk Factors and Pregnancy Outcome," by K. Ofir, E. Sheiner, A. Levy, M. Katz, and M. Mazor, 2003, *American Journal of Obstetrics & Gynecology*, 189(4), 1042-1046.

Landon et al. (2004) performed a prospective four-year observational study at 19 academic medical centers. This study was reviewed early in this chapter in the maternal outcomes after a TOLAC section. Of the 17, 898 women who had a TOLAC, there were 124 (.7%) uterine ruptures, with 114 of those occurring at term. The findings are presented in Table .NICU admission diagnoses were not provided. There were 12 cases of hypoxic ischemic encephalopathy among infants born to women experiencing a TOLAC, 7 of which were due to uterine rupture, resulting in the two neonatal deaths in the study.

Table 16

*Neonatal Outcomes Following Uterine Rupture at Term*

| Outcome                | Uterine Rupture at Term<br>N=114 |
|------------------------|----------------------------------|
| Cord pH <sub>≤</sub> 7 | 23 (20.1%)*                      |
| NICU admissions        | 46 (40.4%)                       |
| HIE                    | 7 (6.2%)                         |

|                |          |
|----------------|----------|
| Apgar 5 min <5 | 16 (14%) |
| Death          | 2(1.8%)  |

*Note.*\*incorrectly calculated in the publication as being 33%.

Adapted from “Maternal and Perinatal Outcomes Associated With a Trial of Labor After Prior Cesarean Delivery,” by M.B. Landon, J. Hauth, K. Leveno, and C. Spong, 2004, *New England Journal of Medicine*, 351(25), 2581-2589.

The risk of uterine rupture, and the sequelae that may accompany it, continues to present a considerable barrier to VBAC. As discussed at length in this chapter, the overall incidence of uterine rupture is low. In fact, the incidence of uterine rupture is not considerably higher than that of other obstetric emergencies such as umbilical cord prolapse (.03%) (Boyle & Katz, 2005), placental abruption (.5%) (Cunningham et al., 2010b), and placenta previa (.03-.05%) (Cunningham et al., 2010b). Further, scientific evidence suggests that uterine rupture does not consistently result in poor outcomes, especially in women with a prior LTCS scar, and that inconsistent use of definitions and outcome measures can exaggerate the negative outcomes of TOLAC and VBAC.

### **Trial of Labor After Cesarean (TOLAC)**

A trial of labor after cesarean (TOLAC) is the process by which a VBAC is attempted, though the terms are often used interchangeably. Ultimately, the result of a TOLAC is either a VBAC or a repeat cesarean. However, when a TOLAC ends in a repeat cesarean, it is often termed a “failed” TOLAC, or a “failed” VBAC, and appears to lend blame to the woman experiencing it. Women attempting a VBAC may already feel as if they are on trial, and do not need to be reminded of it (Clement, 1991). Research suggests that the use of a negative suggestion can have a responding negative effect (Sakala, 2007). A strong message of doubt can be delivered through the use of

commonplace phrases such as a “trial of labor”, “failed VBAC”, or “failure to progress” (Sakala, 2007). It is important that those that care for women are sensitive to the language that is used while caring for them (Sufrin-Disler, 1990).

As discussed previously, the physical benefits of VBAC are well documented in the literature. These benefits include avoidance of operative complications, improved neonatal outcomes, shorter hospital stays, faster postpartum recovery, lower rehospitalization rates, decreased cost, and avoidance of further uterine scarring which could impact future pregnancies (Cleary-Goldman et al., 2005; Lydon-Rochelle et al., 2000; Simpson & Creehan, 2008). From a psychological standpoint, women have described VBAC as being empowering and healing (Fenwick et al., 2003).

Candidate selection for TOLAC is important, as a failed TOLAC is associated with increased rates of maternal and neonatal morbidity when compared with VBAC (Grobman et al., 2007). In the following sections, the outcomes of a failed TOLAC will be discussed in relationship with VBAC and ERCS. In addition, the psychological impact of a failed TOLAC will be addressed. Table 17 outlines the research reviewed in this section.

Table 17

*Maternal and Neonatal Outcomes of ERCS, TOLAC, Failed TOLAC, and VBAC*

| 1 <sup>st</sup> Author<br>Year | Outcome   | Design                     | Purpose  | Total<br><i>n</i>   | Maternal<br>Subjects | Neonate<br>or child<br>subjects | Findings   |
|--------------------------------|---|----------------------------|--|---|----------------------|---------------------------------|--|
| Hook<br>1997                   | Neonatal<br>outcomes of<br>ERCS,<br>TOLAC, and<br>failed<br>TOLAC | Retrospective              | Evaluate neonatal<br>outcomes after<br>ERCS and<br>TOLAC   | 1, 007 infant<br>and mother<br>pairs  | X                    | X                               | Infants born by ERCS were<br>more likely to develop<br>respiratory problems than<br>those born by VBAC.<br>Those born by CS<br>following a failed TOLAC<br>were more likely to<br>undergo testing for sepsis,<br>to be admitted to the<br>NICU, and to have longer<br>lengths of stay.<br>VBAC success rate: 69% |
| Murphy<br>2002                 | Long term<br>maternal<br>effects of<br>RCS                        | Population<br>based cohort | Examine the<br>relationship<br>between CS and<br>subfertility  | 14,541 women  | X                    |                                 | Findings suggest a<br>relationship between CS<br>and subfertility.   |
| Hakannson<br>2003              | Long term<br>neonatal<br>effects of CS                            | Retrospective              | Examine the<br>relationship<br>between CS and<br>childhood<br>hospitalization<br>for asthma and<br>gastroenteritis | 1,265,963<br>children. After<br>exclusion<br>criteria applied,<br>there were<br>863,846 in the<br>study |                      | X                               | There was a 30% increase<br>in risk for developing<br>asthma or gastroenteritis<br>necessitating<br>hospitalization after one<br>year of life for those born<br>by CS  |

|                             |  |  |  |  |   |   |  |
|-----------------------------|--|--|--|--|---|---|--|
| Landon<br>2004              | Maternal and neonatal outcomes with failed TOLAC, ERCS, and VBAC | Prospective cohort study                           | Examine maternal and perinatal outcomes associated with TOLAC  | 15,801 ERCS<br>17,898 TOLAC<br>13,139 VBAC<br>4,759 failed TOLAC                               | X | X | Women experiencing failed TOLAC are at increased risk of complications, but the rate is still quite low. Rate of VBAC: 73.4%   |
| Macones.<br>Peipert<br>2005 | Maternal outcomes associated with VBAC attempt and ERCS          | Secondary analysis of a retrospective cohort study | Examine clinical outcomes in women after one vs. two CS while attempting VBAC  | 25,005 women   | X |   | Uterine rupture, other major operative injury, blood transfusion, and postpartum fever are significantly more likely to occur with attempting VBAC compared with ERCS.   |
| El-Sayed<br>2007            | Maternal and neonatal outcomes following VBAC and failed TOLAC   | Retrospective matched maternal-neonatal sets       | To compare maternal and neonatal outcomes following VBAC and failed TOLAC, excluding uterine rupture, and to examine predictors of success | 1,284 women and their neonates were included<br>1,094 experienced VBAC<br>190 had failed TOLAC | X | X | Women with failed TOLAC are more likely to experience chorioamnionitis, hemorrhage, and hysterectomy. Their children are more likely to experience jaundice, major morbidities, sepsis, and pneumonia.<br>VBAC success rate: 85.2% |



|                  |  |                                |   |  |   |   |
|------------------|--|--------------------------------|---|--|---|---|
| Chigbu<br>2007   | Maternal<br>outcomes<br>following<br>failed<br>TOLAC | Retrospective<br>questionnaire | To examine and<br>understand the<br>experience of a<br>failed TOLAC   | 353 women<br>137 had a<br>previous<br>vaginal<br>delivery<br>216 did not<br>have a previous<br>vaginal<br>delivery | X | Due to practice limitations,<br>not all women had access<br>to pitocin induction and<br>augmentation. Authors<br>recommended further work<br>is necessary in informed<br>consent, and for providing<br>individualized support<br>following CS |
| Loos<br>2008     | Long term<br>maternal<br>effects of<br>RCS           | Questionnaire                  | To explore the<br>prevalence, risk<br>factors, and<br>etiology of<br>chronic pain<br>following<br>cesarean or<br>hysterectomy via<br>Pfannensteil<br>incision | 866 women<br>were included,<br>690 returned<br>questionnaires  | X | Two years following<br>surgery, pain at the incision<br>site was present in 223<br>women. One out of every<br>12 patients (8.2%) reported<br>pain on a regular or<br>continuous basis.  |
| Tollanes<br>2008 | Long term<br>neonatal<br>effects                     | Retrospective                  | To explore if<br>delivery by CS is<br>related to chronic<br>respiratory<br>dysfunction  | 1,756,700<br>singleton<br>deliveries<br>between 1967-<br>1998  | X | Asthma was present in<br>2.3% of those born by CS,<br>1.9% in those born by<br>instrumental vaginal<br>delivery, and 1.4% in those<br>born vaginally.   |

|                   |  |  |  |  |   |   |  |
|-------------------|--|--|--|--|---|---|--|
| Zanardo<br>2010   | Long term<br>maternal<br>effects of CS | Retrospective<br>data, followed<br>by phone call<br>interviews at<br>regular basis | Evaluation of<br>breastfeeding<br>rates from<br>delivery to 6<br>months for<br>mothers who<br>experienced<br>emergency CS,<br>elective CS, and<br>vaginal delivery | 2,137 women<br>and infants<br>1,496 delivered<br>vaginally<br>677 delivered<br>by CS | X | X | Findings demonstrate a<br>correlation between<br>elective CS , delayed<br>initiation, less opportunity<br>to breastfeed in the<br>delivery room, decreased<br>rates of exclusive<br>breastfeeding, and<br>increased rates of formula<br>feeding. |
| Bonifacio<br>2011 | Long-term<br>neonatal<br>effects       | Prospective<br>longitudinal<br>cohort  | To determine if<br>CS is a risk factor<br>for the<br>development of<br>type 1 diabetes in<br>the child.  | 1,650 children<br>born to a parent<br>with type 1<br>diabetes.<br>495 born by CS     |   | X | Children born by CS had<br>more than a two-fold<br>increase in type 1 diabetes.<br>CS associated with a faster<br>progression of diabetes<br>after appearance of<br>autoimmunity ( $p=0.015$ )   |

### **Maternal and Neonatal Outcomes of ERCS, Failed TOLAC, and VBAC**

A challenge exists in reviewing this area of research. It is not uncommon to find TOLAC results, whether successful or unsuccessful, pooled together and compared with those of ERCS. This may result in an increased overall reported risk of attempting VBAC. As discussed previously, pregnant women may view themselves at greater risk than they actually are, resulting in higher levels of fear, and acquiescence to potentially biased recommendations (Baker et al., 2005; Darbyshire et al., 2003).

Macones et al. (2005) studied the incidence and risk factors for uterine rupture in women attempting VBAC using a retrospective, multicenter case-controlled cohort study. The incidence of complications including bladder injury, other major operative injury (bowel injury, uterine artery laceration), blood transfusion, and postpartum fever were examined. There were 17 sites that participated, including tertiary teaching facilities and community hospitals. Participants were identified using International Classification of Disease (ICD) coding of “previous cesarean delivery, delivered”. The records of 25, 005 women were reviewed by trained nurse abstractors. Results are located in Table 18 and were categorized by “VBAC attempt”, “Elective Repeat Cesarean”, with no outcome differentiation of the VBAC attempt.

Table 18

*Maternal Morbidities Associated with VBAC Attempt and Elective Repeat Cesarean*

| Morbidities                     | VBAC attempt | Elective<br>Repeat Cesarean | <i>P value</i> |
|---------------------------------|--------------|-----------------------------|----------------|
| Uterine rupture                 | 0.9%         | 0.004%                      | <.001          |
| Bladder injury                  | 0.4%         | 0.4%                        | .79            |
| Other major<br>operative injury | 0.9%         | 0.6%                        | .003           |
| Blood transfusion               | 0.7%         | 1.2%                        | <.001          |
| Postpartum fever                | 9.4%         | 13.0%                       | <.001          |

Adapted from “Maternal Complications With Vaginal Birth After Cesarean Delivery: A Multicenter Study” by G.A. Macones, J. Peipert, D.B.Nelson, A.Odibo, E.J Stevens , D.M. Stamilio, E. Pare, M. Elovitz, A. Sciscione, M.D. Sammel, S.J. Ratcliffe, 2005, *American Journal of Obstetrics & Gynecology*, 193(5), 1656-1662.

This is an example of a biased comparison of TOLAC and elective repeat cesarean. The category of “other major operative injury” which includes bowel injury and uterine artery laceration, would most likely not be experienced by a woman having a successful VBAC attempt. Yet, it is reported as morbidity associated with a VBAC, thereby implying an inherent risk. The rate of postpartum fever was found to be increased in women who have an elective repeat cesarean. However, this may have been related to epidural use (Segal, 2010). Therefore, the reported rate of postpartum fever in women who attempted VBAC, while lower than those experiencing an ERCS, might have been elevated as a result of epidural use.

Landon et al. (2004), in a prospective cohort study, examined the maternal and perinatal outcomes associated with a TOLAC. Nineteen academic medical centers

belonging to the National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units network participated. Women with a prior cesarean delivery, a current singleton pregnancy of 20 weeks or more, or an infant with a birthweight of 500 grams or more were included. During the years of 1999-2002, there were 17, 898 women who experienced a TOLAC, and 15, 801 women who underwent an ERCS. Of the 17, 898 women who underwent a TOLAC, 13, 139 (73.4%) experienced VBAC, and 4, 759 had a failed TOLAC. Table 19 contains an outline of the findings of a failed TOLAC, ERCS, and VBAC. While it is apparent that women who experience a failed TOLAC are at an increased risk of complications, the overall rate of complicating events is still quite low, with the majority of women experiencing none. Prenatal outcomes for term infants were categorized by TOLAC or ERCS, and are outlined in Table 20. For the infants, there was no differentiation between successful and failed TOLAC.

Table 19

*Maternal Complications of Failed TOLAC, ERCS, and VBAC*

| Complication           | Failed TOLAC<br>(n=4759) | ERCS<br>(n=15,801) | VBAC<br>(n=13, 139) |
|------------------------|--------------------------|--------------------|---------------------|
| Uterine rupture        | 110 (2.3%)               | 0                  | 14(0.1%)            |
| Uterine dehiscence     | 100 (2.1%)               | 76 (0.5%)          | 14 (0.1%)           |
| Hysterectomy           | 22 (0.5%)                | 47 (0.3%)          | 19 (0.1%)           |
| Thromboembolic disease | 4 (0.1%)                 | 10 (0.1%)          | 3(0.02%)            |
| Transfusion            | 152 (3.2%)               | 158 (1.0%)         | 152 (1.2%)          |
| Endometritis           | 365 (7.7%)               | 285 (1.8%)         | 152 (1.2%)          |

|                          |             |            |            |
|--------------------------|-------------|------------|------------|
| Maternal death           | 2 (.04%)    | 7 (.04%)   | 1 (0.01%)  |
| Other adverse events     | 63 (1.3%)   | 52 (0.3%)  | 1 (0.01%)  |
| One or more of the above | 669 (14.1%) | 563 (3.6%) | 309 (2.4%) |

Adapted from “Maternal and Perinatal Outcomes Associated With a Trial of Labor After Prior Cesarean Delivery,” by M.B. Landon, J. Hauth, K. Leveno, and C. Spong, 2004, *New England Journal of Medicine*, 351(25), 2581-2589.

Table 20

*Neonatal Outcomes of Failed TOLAC and ERCS*

| Outcome                  | Trial of Labor<br>(N=15,338) | ERCS<br>(N=15,014) | P=     |
|--------------------------|------------------------------|--------------------|--------|
| Antepartum stillbirth    |                              |                    |        |
| 37-38 weeks              | 19 (0.40%)                   | 8 (0.10%)          | 0.008  |
| ≥39 weeks                | 16 (0.20%)                   | 5 (0.10%)          | 0.07   |
| Intrapartum stillbirth   |                              |                    |        |
| 37-38 weeks              | 1 (0.02%)                    | 0                  | 0.43   |
| ≥39 weeks                | 1 (0.02%)                    | 0                  | 1.0    |
| HIE                      | 12 (0.08%)                   | 0                  | <0.001 |
| Neonatal death           | 13 (0.08%)                   | 7 (0.05%)          | .19    |
| One or more of the above |                              |                    | <0.001 |

Adapted from “Maternal and Perinatal Outcomes Associated With a Trial of Labor After Prior Cesarean Delivery,” by M.B. Landon, J. Hauth, K. Leveno, and C. Spong, 2004, *New England Journal of Medicine*, 351(25), 2581-2589.

El-Sayed et al. (2007) examined maternal and neonatal outcomes following VBAC and failed TOLAC. However, this study excluded cases of uterine rupture in order to provide more precise information regarding the outcomes VBAC and failed TOLAC. There were 1284 women in this study, of which 1094 (85.2%) experienced VBAC, and 190 (14.8%) underwent a cesarean after a failed TOLAC. Women who experienced a

failed TOLAC were significantly more likely to experience chorioamnionitis, hemorrhage, and hysterectomy than those that had a VBAC. Infants born after a failed TOLAC were significantly more likely to experience jaundice, major morbidities, sepsis, and pneumonia than those born by VBAC. Table 21 displays maternal outcomes, and table 22 displays neonatal outcomes.

Table 21

*Maternal Outcomes of VBAC vs. Failed TOLAC*

| Outcomes         | VBAC<br>N=1094 | Failed TOLAC<br>N=190 | P value |
|------------------|----------------|-----------------------|---------|
| Chorioamnionitis | 60 (5.5%)      | 49 (25.8%)            | <.001   |
| Hemorrhage       | 173 (15.8%)    | 68(35.8%)             | <.001   |
| Transfusion      | 8 (0.7%)       | 2 (1%)                | .65     |
| Hysterectomy     | 0              | 2(1.0%)               | .02     |
| Death            | 0              | 0                     |         |

Adapted from “Perinatal Outcomes After Successful and Failed Trials of Labor After Cesarean Delivery,” by Y. El-Sayed, M. Watkins, M. Fix, M. Druzin, K. Pullen, and A. Caughey, 2007, *American Journal of Obstetrics and Gynecology*, June 2007, 583e.1-583.e5.

Table 22

*Neonatal Outcomes of VBAC vs. Failed TOLAC*

| Outcomes            | VBAC<br>N=1094 | Failed TOLAC<br>N=190 | P value |
|---------------------|----------------|-----------------------|---------|
| Jaundice            | 112(10.2%)     | 33 (17.4%)            | .004    |
| Major morbidities * | 31 (2.8%)      | 12 (6.3%)             | .01     |
| Sepsis              | 4(0.4%)        | 4 (2.1%)              | .02     |

|                             |          |          |     |
|-----------------------------|----------|----------|-----|
| Pneumonia                   | 7 (0.6%) | 5 (2.6%) | .02 |
| RDS                         | 9 (0.8%) | 3 (1.6%) | .40 |
| Acidosis                    | 6 (0.8%) | 3 (2.0%) | .19 |
| Intraventricular Hemorrhage | 1(0.1%)  | 0        | .85 |
| Trauma                      | 7 (0.6%) | 0        | .60 |
| Subgaleal bleed             | 5 (0.5%) | 0        | .35 |

*Note.\** Includes sepsis, pneumonia, RDS, acidosis, intraventricular hemorrhage, trauma, and subgaleal bleed. Adapted from “Perinatal Outcomes After Successful and Failed Trials of Labor After Cesarean Delivery,” by Y. El-Sayed, M. Watkins, M. Fix, M. Druzin, K. Pullen, and A. Caughey, 2007, *American Journal of Obstetrics and Gynecology*, June 2007, 583e.1-583.e5.

A failed TOLAC is associated with increased rates of respiratory distress and transient tachypnea of the newborn (Hook et al., 1997). These findings have been replicated in other studies (Fisler, Cohen, Ringer, & Lieberman, 2003). RDS and transient tachypnea of the newborn have been identified as risk factors for the development of childhood asthma (Smith et al., 2004).

Neonatal outcomes following ERCS, VBAC, and failed TOLAC were retrospectively studied (Hook et al., 1997). There were 1007 women included in the study. The participants had a history of a prior cesarean section, were from 3 hospital sites, and delivered between the years of 1992-1993. Of the 1007 women with a previous cesarean, 508 planned an ERCS, and 409 planned a TOLAC. In order to provide baseline rates of complications, the authors included an additional 989 women who had routine vaginal deliveries. The authors initially pooled the data regarding failed and successful TOLAC to compare with ERCS, but did include outcomes based on whether the TOLAC



was successful or failed. Table 23 includes data regarding the neonatal outcomes, tests, and interventions.

Table 23

*Neonatal Outcomes of ERCS, TOLAC, and Failed TOLAC*

| Neonatal Outcomes, Tests, and Interventions | ERCS<br>N=497 | TOLAC/VBAC<br>N=492 | Failed<br>TOLAC/CS<br>N=156 | <i>P</i> value |
|---|---------------|---------------------|-----------------------------|----------------|
| Apgar $\leq 6$ at 1 min.                    | 20 (4%)       | 48(10%)             | 22(14%)                     | <0.0002        |
| Respiratory Problems (total)                | 35(7%)        | 26(5%)              | 12(8%)                      | <0.03          |
| Transient tachypnea                         | 31(6%)        | 26(5%)              | Not delineated              | <0.006         |
| Respiratory distress syndrome               | 2(0.4%)       | 0                   | 0                           |                |
| Suspected Sepsis                            | 9(2%)         | 25(5%)              | 18(12%)                     | <0.004         |
| Proven Sepsis                               | 0             | 4(1%)               | 3(2%)                       | <0.02          |
| Bilirubin $\geq 13$ mg/dL                   | 29(6%)        | 11(2%)              | 8(5%)                       | <0.0001        |
| Blood culture testing                       | 46(9%)        | 84(18%)             | 39(25%)                     | <0.0004        |
| Antibiotic therapy                          | 15(3%)        | 40(8%)              | 22(14%)                     | .0003          |
| Admission to NICU                           | 10(2%)        | 17(3%)              | 11(7%)                      | <0.007         |
| Overall length of stay                      | 4.5 $\pm$ 1   | 3.7 $\pm$ 2         | 4.8 $\pm$ 2                 | <0.002         |

Adapted from "Neonatal morbidity after elective repeat cesarean section and trial of labor," by B.Hook, R. Kiwi, S.B. Aminia, A. Fanaroff, and M. Hack, 1997, *Pediatrics*, 100(3), 348-353.

Infants born by ERCS were at an increased risk of developing respiratory problems including respiratory distress syndrome and transient tachypnea. Those infants born after a cesarean for a failed TOLAC were more likely to undergo testing and

treatment for suspected sepsis, though the proven sepsis rate was only 2%. They were also more likely to be admitted to the NICU, and had longer lengths of stay. The authors concluded that ERCS-born infants were at an increased risk of respiratory problems, TOLAC-born infants had variable morbidities, and that increased maternal and fetal morbidities existed after a failed TOLAC. While maternal and fetal outcomes after a successful TOLAC were deemed excellent by the authors, this study reinforced the need for further study in TOLAC candidate selection.

In addition, the authors (Hook et al., 1997) noted significant differences between infants born after VBAC vs. a failed TOLAC. Infants born after a failed TOLAC were more likely to have suspected sepsis, hyperbilirubinemia, and respiratory problems (not statistically significant) all of which contributed to an increased rate of diagnostic tests, IV fluids, respiratory therapy, and antibiotics. Table 24 outlines the differences in outcomes.

Table 24

*Neonatal Outcomes, Tests, and Interventions after VBAC and Failed TOLAC*

| Neonatal Outcomes, Tests, and Interventions | VBAC<br>N=336 | Failed TOLAC<br>N=156 | <i>P value</i> |
|---|---------------|-----------------------|----------------|
| Apgar $\leq 6$ at 1 min.                    | 26(8%)        | 22(14%)               | <0.05          |
| Respiratory Problems<br>(total)             | 14(4%)        | 12(8%)                | NS             |
| Suspected Sepsis                            | 8(2%)         | 18(12%)               | <0.0001        |
| Proven Sepsis                               | 1(0.3%)       | 3(2%)                 | NS             |
| Bilirubin $\geq 13$ mg/dL                   | 3(1%)         | 8(5%)                 | <0.004         |

|                        |         |         |        |
|------------------------|---------|---------|--------|
| Blood culture          | 45(13%) | 39(25%) | <0.005 |
| Antibiotic therapy     | 18(5%)  | 22(14%) | <0.002 |
| Admission to NICU      | 6(2%)   | 11(7%)  | <0.007 |
| Overall length of stay | 3.1±2   | 4.8±2   | <0.01  |

Adapted from “Neonatal morbidity after elective repeat cesarean section and trial of labor,” by B.Hook, R. Kiwi, S.B. Aminia, A. Fanaroff, and M. Hack, 1997, *Pediatrics*, 100(3), 348-353.

### Psychological effect of failed TOLAC

The physical risks and benefits of failed TOLAC have been extensively studied, yet much remains unknown regarding the psychological effects of a failed TOLAC.

Women are sharing their experiences and stories of failed TOLAC with each other via the internet ([www.birthstories.com](http://www.birthstories.com); [www.birthcut.com](http://www.birthcut.com)), but there has been little formal study of the experience.

Women who have attempted a TOLAC or experienced VBAC have verbalized that the experience was very important to them (Phillips et al., 2010). While one might assume that a failed TOLAC is a source of disappointment, women have identified it as a valuable experience (Cleary-Goldman et al., 2005). A TOLAC, even if unsuccessful, has given women the opportunity to fulfill a strong maternal desire to experience labor, and to make decisions regarding their preferred mode of delivery (Cleary-Goldman et al., 2005; Phillips et al., 2010).

In order to understand the experience of failed TOLAC, a study was conducted from 2002-2006 in a teaching facility in Nigeria (Chibgu, Enwereji, & Ikeme, 2007).

Inclusion criteria included one prior cesarean delivery, spontaneous onset of labor in

current pregnancy, with an end result of failed TOLAC. The questionnaires were pretested with 45 women, and contained 10 close-ended and 11 open-ended questions. The questions included those regarding sociodemographics, parity, the women's perceived reasons for the failed TOLAC, and if the women felt that they had received enough information from healthcare personnel. Women were asked to rate their failed TOLAC on a Likert scale of 1-10 with 1 indicating it was "very bad" experience, and 10 indicating an "excellent" experience. The questionnaires were given to 385 women who had experienced an unsuccessful TOLAC in the immediately preceding pregnancy. There was no explanation as to the time between deliveries. There were 353 women (91.7%) who completed the survey. The researchers divided the 353 women into 2 groups based upon whether or not they had a previous vaginal delivery. Table 25 contains the sample specifics and an outline of the mean Likert score rating for each group's satisfaction with the TOLAC experience, factors involved in the women rating their experience as they did, and their desire to attempt a TOLAC again.

Table 25

*Likert Scores, Contributing Factors to Scores, and Desire to Attempt a TOLAC Again*

| Scores, Contributing Factors, and desire to attempt TOLAC again | Group 1 (n=137)<br>Previous Vaginal Delivery | Group 2 (n=216)<br>No Previous Vaginal Delivery |
|---|--|---|
| TOLAC experience  | 7.4±1.2                                      | 2.1±0.9   |
| Having previous vaginal birth                                   | 98 (71.5%)                                   | 0   |
| Dashed expectations of vaginal birth                            | 11 (8%)                                      | 167 (77.3%)                                     |
| Adequate support from personnel                                 | 17 (12.4%)                                   | 8 (3.7%)  |
| Inadequate support from personnel                               | 5 (3.6%)                                     | 9 (4.2%)  |

|                               |           |            |
|-------------------------------|-----------|------------|
| Religious belief              | 0         | 5 (2.3%)   |
| Loss of control               | 0         | 16 (17.4%) |
| No reason                     | 6 (4.4%)  | 11 (5.1%)  |
| Desire to attempt TOLAC again | 122 (89%) | 197 (91%)  |

Adapted from “Women’s Experiences Following Failed Vaginal Birth After Cesarean Delivery,” by C.O. Chigbu, J.O. Enwereji and A.C. Ikeme, 2007, *International Journal of Gynaecology & Obstetrics*, 99(2), 113-116.

In this study, due to practice limitations in this developing country, pharmacologic induction and augmentation of labor were not available to participants. This was noted to be a frustration for the participants, and was frequently (72%) cited as a perceived reason for failed TOLAC. However, the majority of participants desired to attempt a TOLAC again. The authors addressed the respondents’ beliefs that they were not given adequate information, and recommended that further steps need to be taken in order to ensure the informed consent process has been properly implemented. They concluded maternity care providers should understand that there are varied emotional and psychological responses to failed TOLAC, and that women need individualized support following the cesarean delivery.

### **Repeat Cesarean Delivery**

The risks of cesarean delivery have been previously discussed in this chapter, particularly as they compare with those associated with VBAC and failed TOLAC. In the following section, the benefits of RCS will be discussed, the risks of RCS will be reviewed, with additional attention being given to long term outcomes of RCS.

**Benefits of repeat cesarean section.** The opportunity to choose their preferred route of delivery is important to women. However, as discussed previously, this choice is dependent on the information provided to women. As a result, this decision making process may favor the bias of the physician or person providing the information (Gamble et al., 2007). However, the choice should ultimately be hers to make (Cunningham et al., 2010a).

There are many reasons for which a woman would choose an ERCS, and they may not all be medically oriented. The opportunity to schedule a cesarean offers a level of convenience for women that might not be afforded with a TOLAC, as they are able to select a date, and make necessary preparations for family and work (Eden et al., 2004; Fenwick, Gamble, & Hauck, 2006). For those desiring postpartum sterilization, the ERCS can be immediately followed by a tubal ligation, without needing to schedule a separate surgery. Following a cesarean section, women may perceive vaginal birth to be unsafe or unachievable (Fenwick et al., 2006). Women may fear vaginal birth, the pain associated with labor, may have experienced a traumatic delivery, and as a result, may prefer a RCS (Fenwick et al., 2006; King, 2010). For those women who have a decreased likelihood of VBAC success, a RCS may offer them a better outcome than a failed TOLAC (El-Sayed et al., 2007).

### **Long-term effects associated with CS/ERCS**

*Long-Term Maternal Effects of CS/ERCS.* A woman's future health and reproductive life is significantly impacted by cesarean section (Zelop & Heffner, 2004). Numerous risks associated with cesarean, whether primary or repeat, have been previously discussed in this chapter. These include operative risks such as infection,

hemorrhage, transfusion, hysterectomy, and damage to surrounding organs during the surgery. Other risks include those associated with uterine scarring resulting from cesarean. Uterine scarring may impact future pregnancies by increasing the risk of abnormally adherent placenta (accreta, increta, percreta), placenta previa, placental abruption, and stillbirth (Zelop & Heffner, 2004). Following cesarean section, women have longer hospital stays, and are at increased risk of pulmonary emboli, infection, and deep vein thrombosis. Uterine dehiscence, a known risk of TOLAC, has been identified at the time of ERCS. Therefore, undergoing an ERCS does not negate the risk of dehiscence (Landon et al., 2004).

The focus of most studies regarding cesarean morbidity has been on the short term, rather than on the long term complications (Silver, 2010). However, emerging research is revealing that women undergoing cesarean section are at increased risk for chronic health issues, including surgical adhesions, pain, and decreased fertility (Silver, 2010).

The Pfannensteil incision, commonly used for LTCS and gynecologic procedures, became widely accepted due to its esthetic appearance and low incidence of incisional hernias (Loos et al., 2008). However, it has been posited that Pfannensteil incisions may result in chronic pain due to abdominal wall nerve entrapment (Loos et al., 2008; Silver, 2010).

Loos et al. (2008) explored the prevalence, risk factors, and etiology of chronic pain following cesarean section or hysterectomy with a Pfannensteil incision. Between January 1, 2003 and December 31, 2004, 967 women underwent Pfannensteil incisions in one Netherlands teaching institution. Of these, 872 were related to cesarean, and 95 were

related to abdominal hysterectomy. Women were excluded for the two year followup questionnaire due to death, unobtainable address, RCS during the study period, previous abdominal surgery, midline incision, or laparoscopic procedures. A total of 866 women were included, with more than ninety percent of participants having experienced cesarean section. The response rate to the questionnaire was 80% (n=690). Two years after the surgery, chronic pain at the incision site was experienced by approximately one third of all patients (223 of 690). One out of every 12 patients (8.2%) experienced pain on a regular or continuous basis (did not denote if this was mild, moderate, or severe), with an additional 7% of participants describing the pain as moderate or severe. Impairment of daily activities due to incisional pain occurred in 8.9% of the participants. Risk factors for chronic pain included experiencing two or more surgeries, and/or emergency cesarean. The authors stated that increased risk of nerve entrapment after more than one surgery is likely due to increased areas of scarring. Additional research is needed in this area, as the amount of data on pain after a Pfannestiel incision is scarce (Loos et al., 2008). Women may experience chronic pain after cesarean, with increased risk after RCS. However, this is an emerging area of knowledge that women and their healthcare providers may not be aware of at this time.

Adhesion development is another possible long-term outcome of cesarean section, and its incidence is in need of further research. It is clear that increased adhesions make subsequent surgeries more difficult, increasing operative times, blood loss, and increase risk of injury to surrounding organs (Silver, 2010). Though rare, these adhesions increase the risk of bowel obstruction after cesarean, and may be related to pain and subsequent infertility.



The impact of cesarean section on fertility has been identified as another area in need of further research. Murphy, Stirrat, Heron, & the Avon Longitudinal Study of Parents and Children (ALSPAC) Study Team (2002) studied the relationship between cesarean section and subfertility in a population based cohort study of 14, 541 women from the UK. The time span of this study was April 1991 to December of 1992. The previous and current pregnancies of the subjects were examined. Of the 14, 541 women, 5787 had a prior pregnancy resulting in a liveborn. Of these 5,787 women, 4006 experienced planned pregnancies. Of these 4006, the duration of time to conceive was known in 3,994 women. The study was based on data obtained from questionnaires given to the woman and her partner at 18 weeks and after delivery.

There was specific data gathered regarding fertility, sexuality, personal health history, health habits, contraception, and demographic information. In addition, the participants were asked if this was a planned pregnancy, and, if so, how long they had been trying to conceive. Women with a prior cesarean section were compared with women with no history of cesarean section. The findings, outlined in Table 26, were adjusted for duration, oral contraceptive pill use, cigarette exposure, alcohol consumption, educational level, ethnicity, parity, change in partner, and BMI. However, no information regarding male infertility appears to have been collected. Previous cesarean section, subfertility, and degree of parity were examined. Findings were adjusted for co-habitation, duration, oral contraceptive pill use, cigarette exposure, alcohol consumption, educational level, ethnicity, parity, maternal BMI, and change of partner. Table 27 contains findings based on years of subfertility.

Table 26

*Rates of Subfertility and Method of Previous Delivery*

| Subfertility | Total Subfertile | Previous Cesarean (n=422) | No Previous Cesarean (n=3572) | Odds Ratio 95% CI Adjusted OR |
|--------------|------------------|---------------------------|-------------------------------|-------------------------------|
| >1 year      | 306              | 50 (11.8%)                | 256 (7.2%)                    | 1.53 (1.09, 2.14)             |
| >3 years     | 59               | 11 (2.6%)                 | 48 (1.3%)                     | 1.70 (0.83, 3.47)             |

Adapted from "The Relationship Between Cesarean Section and Subfertility in a Population-Based Sample of 14,541 Pregnancies," by D.J. Murphy, G.M. Stirrat, J. Heron, and the ALSPAC Study Team, 2002, *Human Reproduction*, 17(7), 1914-1917.

Table 27

*Parity, Subfertility and Method of Previous Delivery*

| Parity      | Sub fertility | Previous Cesarean | No Previous Cesarean |
|-------------|---------------|-------------------|----------------------|
| =1 (n=2852) | >1 year       | 24 (8.5%)         | 185 (7.2%)           |
|             | >3 years      | 6 (2.1%)          | 33 (1.28%)           |
| ≥2 (n=1142) | >1 year       | 26 (18.7%)        | 71 (7.1%)            |
|             | >3 years      | 5 (3.6%)          | 15 (1.5%)            |

Adapted from "The Relationship Between Cesarean Section and Subfertility in a Population-Based Sample of 14,541 Pregnancies," by D.J. Murphy, G.M. Stirrat, J. Heron, and the ALSPAC Study Team, 2002, *Human Reproduction*, 17(7), 1914-1917.

While limited by focusing only on female fertility, the findings suggest an association between prior cesarean section and subfertility. The authors concluded that there might be a cumulative effect of cesarean on subsequent fertility, as those with two or more prior cesareans had higher incidence of subfertility. Further evidence regarding

long term consequences of cesarean is needed in order for women to be offered true informed choice (Murphy et al., 2002).

Cesarean section often results in separation of mother and baby that is spatial, auditory, and visual in nature (Nolan & Lawrence, 2009). This separation, and subsequently being unable to hold, touch, or see their baby, has been described as being highly distressing to mothers (Fenwick et al., 2003). The initial mother-baby contact may be delayed and brief, with less skin-to-skin contact (Chalmers et al., 2010). New mothers have described feeling disconnected to their new babies, and this has persisted for a significant period of time after the delivery (Fenwick et al., 2003). This physical separation of mother and baby has resulted in delayed initiation of breastfeeding, which contributes to decreased rates of breastfeeding (Chalmers et al., 2010; Zanardo et al., 2010).

Zanardo et al. (2010) evaluated breastfeeding rates from delivery to 6 months postpartum in infants born by emergency cesarean, elective cesarean, and vaginal delivery. The study was conducted at a level III facility within the University of Padua School of Medicine. The university is located in an industrialized area of northern Italy.

There were 2, 137 infants in this study, of which 1, 496 (68.8%) were delivered vaginally. Of the 677 (31.1%) infants delivered by cesarean, 398 (18.3%) were classified as elective, and 279 (12.8%) were emergent. The term “elective cesarean” denoted those that were performed prior to spontaneous or induced labor. Emergent cesareans were those performed after the onset of labor. Data that was collected included mode of delivery, Apgar scores, birthweight, breastfeeding initiation rates, and breastfeeding

duration rates. Follow up phone interviews regarding breastfeeding were conducted at 7 days, 3 months, and 6 months postpartum.

Participants were classified as exclusively breastfeeding (breastmilk only), mixed feeding (breastmilk and formula), and formula feeding (formula only). There were 1,567 (72.1%) mothers who consented to telephone interviews, of which 69.7% delivered vaginally, 12.1% experienced an emergent cesarean, and 18% had an elective cesarean delivery. This was similar to the mode of delivery distribution in the initial sample. Table 41 contains the findings regarding breastfeeding in the delivery room, times of breastfeeding initiation, and breastfeeding rates at discharge. Table 42 contains the findings of the follow up phone study.

Table 28

*Breastfeeding Practices and Mode of Delivery*

| Breastfeeding Practices                       | Vaginal delivery (N=1, 496) | Emergency cesarean (N=279) | Elective Cesarean (N=398) |
|---|-----------------------------|----------------------------|---------------------------|
| In the delivery room                          | 1, 71 (71.5%)               | 4 (1.4%)                   | 14 (3.5%)                 |
| Initiation time (hrs): birth to first feeding | 3.1 ± 6.0                   | 13.4 ±13.1                 | 10.4±3.5                  |
| Upon discharge                                |                             |                            |                           |
| Exclusive                                     | 1, 312 (87.8%)              | 204 (73.4%)                | 296 (74.4%)               |
| Mixed   | 170 (11.3%)                 | 70 (25.3%)                 | 94 (23.6%)                |
| Formula                                       | 14 (0.9%)                   | 5 (1.7%)                   | 8 (3.2%)                  |

Adapted from “Elective cesarean delivery: does it have a negative effect on breastfeeding?” by V. Zanardo, G. Svegliado, F. Cavallin, A. Giustardi, E.L.Cosmi, P. Litta, and D. Trevisanuto, 2010, *Birth*, 37(4), 275-279.

Table 29

*Breastfeeding Practices at 7 days, 3 Months, and 6 Months by Mode of Delivery*

| Follow Up | Vaginal delivery<br>(n=1093) | Emergency Cesarean<br>(n=191) | Elective Cesarean<br>(n=283) |
|-----------|------------------------------|-------------------------------|------------------------------|
| 7 days    |                              |                               |                              |
| Exclusive | 939 (85.9%)                  | 150 (78.5%)                   | 211 (74.5%)                  |
| Mixed     | 55 (5%)                      | 14 (7.3%)                     | 28 (9.8%)                    |
| Formula   | 99 (9.0%)                    | 27 (14.2%)                    | 44 (15.7%)                   |
| 3 months  |                              |                               |                              |
| Exclusive | 765 (69.9%)                  | 106 (55.4%)                   | 156 (55.1%)                  |
| Mixed     | 108 (9.8%)                   | 25 (13%)                      | 40 (14.1%)                   |
| Formula   | 220 (20.1%)                  | 55 (28.7%)                    | 86 (30.3%)                   |
| 6 months  |                              |                               |                              |
| Exclusive | 645 (59%)                    | 82 (42.9%)                    | 132 (46.6%)                  |
| Mixed     | 86 (7.8%)                    | 21 (10.9%)                    | 25 (8.8%)                    |
| Formula   | 362 (33.1%)                  | 88 (46%)                      | 126 (44.5%)                  |

Adapted from “Elective cesarean delivery: does it have a negative effect on breastfeeding?” by V. Zanardo, G. Svegliado, F. Cavallin, A. Giustardi, E.L.Cosmi, P. Litta, and D. Trevisanuto, 2010, *Birth*, 37(4), 275-279.

These findings demonstrate a correlation between elective cesarean section, delayed initiation of breastfeeding, less opportunity (if any) to breastfeed in the delivery room, decreased rates of exclusive breastfeeding, and increased rates of formula feeding when compared with those of women who delivered vaginally. Therefore, women delivering by cesarean should be made aware of this, particularly if they are interested in breastfeeding, and care should be given that promotes early mom-baby contact and breastfeeding initiation.

***Long-Term Neonatal Effects of CS/ERCS.*** More women elect to have a RCS rather than a TOLAC, due to concern over a potential threat of harm to their babies (Harer, 2002). As discussed previously, there is a risk of fetal injury during surgery

(Alexander et al., 2006). In the following section, additional neonatal outcomes associated with an ERCS will be reviewed.

There is evidence that cesarean section may increase the risk of developing chronic respiratory dysfunction, though the exact mechanism is unknown (O'Shea et al., 2010; Tollanes et al., 2008). Infants born by cesarean section have also been found to be at increased risk for hospitalization during childhood for asthma and gastroenteritis (Hakansson & Kallen, 2003). This has been hypothesized as being due to a disturbance of intestinal colonization and subsequent allergic manifestations that result from this disturbance (Hakansson & Kallen, 2003), as infants born by cesarean have decreased "exposure to healthy probiotic bacteria" (Hanson & VandeVusse, 2013, p. 279). Children born by cesarean section have also been found to be at a statistically significant ( $p=.001$ ) increased risk of childhood-onset Type 1 diabetes mellitus (Cardwell et al., 2008; Bonifacio et al., 2011).

A large scale, national cohort study spanning the years of 1967-1998, consisting of 1,756,700 singleton deliveries was conducted utilizing the Medical Birth Registry of Norway (Tollanes et al., 2008). The infants were followed up to the age of 18, or until the year 2002. Mode of delivery was classified as spontaneous vaginal, instrumental vaginal, or cesarean. In 1988, cesarean sections were classified as being emergent or planned. The rate of asthma was monitored through the National Insurance Scheme, which provides cash benefits to families of children with severe chronic illnesses. The analyses were adjusted based on the categorical variables of maternal age, history of maternal asthma, maternal education level, gender, gestational age, and year of birth.

The cumulative rate of asthma was 4.0 in 1000. The prevalence of asthma was 2.3% in those born by cesarean, 1.9% in those born by instrumental vaginal delivery, and 1.4 % in those born by spontaneous vaginal delivery. Overall, being born by cesarean resulted in a 52% increased risk of asthma hazard ratio ([HR] = 1.52; 95% confidence interval [CI] = 1.42 to 1.62).

Hakannson & Kallen (2003) conducted a retrospective study of cesarean birth and incidence of hospitalization in childhood for asthma and gastroenteritis. Data was obtained from the Swedish Medical Birth Registry (MBR) and the Hospital Discharge Registry (HDR). The two databases were linked for this study. Exclusion criteria included: birth weight less than 2500 grams, birth weight greater than 5000 grams, multiple gestations, preterm birth (<37 weeks), small for gestational age, a 5 minute Apgar score of less than 9, any diagnosis indicative of a perinatal complication, any congenital malformation, or death before age 1.

There were 1,265,963 children born during the years of 1984-1996. After applying the exclusion criteria, there were 863,846 children in the study. The authors categorized the children into four groups: those admitted for asthma (n=13, 058), those admitted for gastroenteritis (n=20, 377), those never admitted to the hospital (n=637,901), and those admitted for other reasons besides asthma or gastroenteritis (n=192, 510). There were two control groups formed. Control group A consisted of those never admitted as inpatients, and control group B consisted of those who had been admitted for reasons other than asthma or gastroenteritis. The authors included a separate group of vaginally delivered siblings of children admitted for asthma and/or gastroenteritis for comparison.

The authors found that there was a 30% increase in the risk for developing asthma or gastroenteritis necessitating hospitalization after one year of life for children born by cesarean section. Children that were hospitalized were also more likely to have been born by cesarean. Interestingly, those vaginally delivered siblings of infants born by cesarean section were more likely to be hospitalized than those that were born vaginally. The authors hypothesized that this could be due to mothers who delivered by cesarean being comfortable with medical intervention. This study revealed the impact of cesarean section affects the child's health outside of the neonatal period, and may contribute to the increasing rates of allergies and respiratory illnesses.

Bonifacio et al. (2011) examined cesarean section as a risk factor for the development of type 1 diabetes in 1,650 children. The children were born to one parent that had type 1 diabetes, and were followed from birth for the development of autoantibodies and type 1 diabetes. All participants were recruited from 1989-2000 for a longitudinal study examining the natural history of islet autoimmunity and type 1 diabetes. Families of German Caucasian descent made up 97% of the cohort. Perinatal data was collected from each child's pediatric record, and included maternal age at delivery, mode of delivery, gestational age, sex, and singleton birth status. A questionnaire was given to mothers to report parity and smoking status. Of the 1650 children enrolled, 1,505 had their mode of delivery reported in their records. Of these, 560 were born by cesarean section, and 945 by vaginal delivery. A total of 51 children developed diabetes during follow up. By the age of 12, 4.8% of those delivered by cesarean had developed diabetes, compared with 2.2% of those delivered vaginally, more than a two-fold increase in risk ( $p=0.001$ ). This increased risk remained after adjusting



for variables of maternal diabetes, paternal diabetes, non-singleton birth, preterm birth, being firstborn, or maternal smoking during pregnancy. The authors suggest that the increased risk of diabetes in those born by cesarean is due to an interaction between cesarean and immune response genes. While this study was not population based, it did reveal additional risk associated with cesarean birth, particularly for those more susceptible to developing type 1 diabetes. As stated previously, a woman's choice regarding mode of delivery after a prior cesarean is hers to make. However, this choice must be based upon complete and unbiased information.

When electing to have a RCS, a woman needs to be informed regarding the short term and long-term implications of this decision. This decision may have long-term implications for her health, fertility, and bonding with her infant. It may also have long-term implications for her child's health, respiratory function, allergy status, and type 1 diabetes risk.

### **Qualitative Inquiry Regarding VBAC**

The majority of research regarding VBAC has involved the physical risk associated with it, and has been quantitative in nature. Research involving the psychosocial aspects of the VBAC experience from the woman's perspective is minimal (Lundgren, Begley, Gross, & Bondas, 2012; Phillips et al., 2010). There has been qualitative research performed addressing the mode of delivery decision making, factors influencing the choice of VBAC, women's preference for VBAC, and the VBAC experience from the woman's perspective. Individual VBAC stories have been shared and published within Midwifery Today (Briggs, 1988; Freedman, 2000), and have been used to generate commentaries by healthcare professionals (Feldman, Cymbalist, Vedam,

& Kotaska, 2010). However, to date, very few studies exist that have studied the experience of VBAC from the woman's perspective. Table 30 summarizes this research.

Table 30

*Qualitative VBAC Research*

| Author                | Year | Design  | Sample Size |
|-----------------------|------|---|-------------|
| Ridley et al.         | 2002 | Qualitative descriptive interview                     | 5           |
| Shorten et al.        | 2004 | Pilot study, questionnaire                            | 21          |
| Cleary-Goldman et al. | 2005 | Prospective, questionnaire                            | 95          |
| Emmett et al.         | 2006 | Qualitative interview                                 | 21          |
| Goodall et al.        | 2009 | Qualitative interview                                 | 8           |
| Frost et al.          | 2009 | Qualitative nested within a randomized clinical trial | 30          |
| Meddings et al.       | 2007 | Qualitative phenomenological interview                | 8           |
| Phillips et al.       | 2010 | Qualitative phenomenological                          | 4           |
| McGrath et al.        | 2010 | Qualitative phenomenological                          | 6           |
| Fenwick et al.        | 2007 | Qualitative descriptive explorative                   | 35          |
| Lundgren et al.       | 2012 | Metasynthesis   | 8 studies   |

Ridley and colleagues (2002) investigated what influences women's decisions to choose VBAC. Their qualitative study included the guided interviews of 5 rural American women. All participants had experienced VBAC at the same hospital within 2 to 4 months prior to the interview. All interviews were conducted within the participant's home, or at the home of a family member.

While the sample size was small, the authors reported reaching thematic saturation. Meanings and themes were validated by the researchers' colleagues and research participants. The authors identified major influences in choosing VBAC including the woman's sense of control during the decision making process, the encouragement that she received from her physician, and the physical and emotional advantages of VBAC. The authors concluded women's decisions are influenced by several personal internal and external factors, and that they should be encouraged to VBAC by their healthcare providers.

Shorten and colleagues (2004) explored the impact of a decision-aid in women's experiences of choosing a childbirth method after a prior cesarean through the development and pilot test of an evidence-based decision aid. An education booklet, consisting of evidence based guidelines and recent research, outlined the risks and benefits of VBAC and repeat cesarean. A draft of this education booklet was reviewed by women who had experienced a prior cesarean, as well as nursing, medical, education, and midwifery experts prior to the pilot test. The final draft for the pilot study had a Flesch score of 63.7, and a reading grade level of 7.8, which was deemed appropriate for this study.

To explore the effectiveness of the decision aid a convenience sample of 21 pregnant women with a history of a prior cesarean who were making decisions about the birth mode of their current pregnancy was selected from 2 participating hospital sites; 11 from hospital one, that had a TOLAC success rate of 80%; 10 from a second hospital two had a TOLAC success rate of 20%. The participants completed a questionnaire prior to and after reading the decision aid information booklet.

In the first hospital's group, 8 of 11 women desired a TOLAC prior to reviewing the booklet, but only 6 desired a TOLAC following the review. In the second hospital group, 7 women preferred a TOLAC prior to reviewing the booklet, but only 5 desired a TOLAC following the review. While a decision aid may facilitate discussions and decision-making regarding mode of delivery, the authors did not mention if the participants had the opportunity to discuss their preference (after reviewing the booklet) with their provider, prior to taking the second questionnaire. Further, it is possible that the decision-aid was worded in a manner that frightened the participants about the prospect of a TOLAC. While the sample size was small, and this was a pilot test, the results suggest that there may be a component of control that providers exert over the women's decision making. The practitioners involved in this study may have been reluctant to offer a choice if it is in opposition to their own preferences.

In order to further evaluate knowledge regarding TOLAC, as well as to determine patient satisfaction with delivery after a previous cesarean, Cleary-Goldman and colleagues (2005) investigated the experiences of 95 women. A formal VBAC counseling program was operational over a 12-month period. This study prospectively investigated pregnancies that followed cesarean birth in which women were being formally counseled regarding the risks and benefits of a TOLAC. Women were individually counseled regarding TOLAC by one of two trained individuals. A questionnaire was given during the antepartal period, following the counseling that included questions regarding their previous pregnancy and cesarean delivery. A postpartum questionnaire was given that included questions regarding the most recent delivery, satisfaction, as well as questions pertaining to risks and benefits of a TOLAC. While the questions are available by

request, they were not presented within the publication, which prevented determining exactly what information was being requested of subjects. The primary author was contacted for a copy of the questions. At the time of this writing, the questions have yet to be received.

The study participants were divided into four groups. Group 1 consisted of those who had a VBAC (26; 27%). Group 2 were those that had attempted VBAC, but underwent a RCS during labor (18; 19%). Group 3 had planned to attempt VBAC, but underwent a RCS prior to labor (16; 17%). These cesareans had been done for numerous reasons including abruption, abnormal fetal testing, suspected large for gestational age fetuses, and malpresentation. Group 4 had chosen an ERCS (35; 37%). All four groups reported an increased level of satisfaction with the present delivery, regardless of the delivery method. Those that had a successful VBAC were more satisfied than those that did not. However, 92% of those that were not able to VBAC were pleased that they had attempted a TOLAC. During the postpartum period, women completed a test comprised of questions regarding the risks and benefits of VBAC. It was found that 92% of the participants scored perfectly on the test, and another 4% missed only one question. This study's results, though limited by the number of participants and not necessarily representative of the general population, suggest that women value the opportunity to attempt a TOLAC, even if they are unsuccessful.

To further understand the decision making process regarding the mode of delivery after a prior cesarean section, as well as the role of the health professional in the decision making process, a qualitative study was conducted (Emmett, Shaw, Montgomery, Murphy, & DiAMOND study group, 2006). Twenty-one women with a prior cesarean

section, who had subsequently delivered in the last 2-8 months, were interviewed.

Twelve women had planned to VBAC, 5 of whom were successful. Nine women had planned an elective repeat cesarean, with one of them undergoing VBAC. The semi-structured interviews were held in the women's homes, and the data was examined using a framework approach. This approach, attributed to Richie & Spencer (1994) involves five phases including: familiarization, identifying a thematic framework, indexing, charting, mapping, and interpretation

The participants' experiences with decision making varied widely. Women described varying levels of certainty in their decision to either VBAC or have an ERCS. The women described that information used to make their decision was usually given to them verbally, though some recalled being given written information, and others (numbers not identified) did additional research on their own. Participants identified that it would have been helpful to receive information regarding VBAC shortly after their initial cesarean section.

When examining the role of the health professional in the decision making process, most participants (n=19) stated that they were able to make their own decisions regarding the preferred mode of delivery. One participant indicated that she felt pressure to attempt VBAC, and another shared that she did not feel supported in her decision to attempt VBAC. The health professionals were perceived by the participants to be informing women of their options, not directing or guiding their decision making. For many participants, this approach worked well. These findings revealed the need for consistent, unbiased information regarding VBAC. Further, because some women may desire more guidance, this study demonstrated the need for individualized support for

women during the decision making process based upon the decision making preferences of women.

Women's perceptions of the role of the healthcare provider in decision making about delivery of a child after a previous cesarean was examined in a qualitative study (Goodall, McVittie, & Magill, 2009). Ten women from the UK, pregnant with their second child, median gestational age of 32 weeks, were recruited to participate in this qualitative study. All participants had one prior cesarean. Two women had undergone planned cesareans, and the others had experienced emergent cesareans. Their participation consisted of a semi-structured interview that was held in their homes. The interview consisted of 6 non-leading questions regarding the duration of the decision-making process, opinions of others, control, and information gathering. The interviews were audiotaped, transcribed, and examined for themes.

Four themes emerged from the analysis including lack of knowledge, generalized information, latent communication, and loss of control. All participants expressed that they had a lack of knowledge regarding cesarean, its impact on future delivery choices, and an inability to gain necessary knowledge. In their search for knowledge, they turned to healthcare providers. While the healthcare providers stressed the importance of individual choice, the information they often shared was probability based, and perceived as being unhelpful to individuals trying to make a decision. The researchers noted that none of the participants reported receiving information regarding the risks associated with repeat cesarean or the risk of uterine rupture. There were elements of latent communication where the women received mixed messages, a combination of personal preferences of the healthcare providers and generalized information emphasizing patient

choice. As a result of not having necessary knowledge, receiving inadequate information and mixed messages, the women relinquished control of their decision-making.

This study's results, though not applicable to the general population, suggests that there is a need for women to receive information that can assist them in making a truly informed choice. This information should be presented in a way that is specific to the individual. In addition this study revealed that there are aspects of communication between healthcare professionals and women that should be modified, and that "have the potential to increase the number of women opting for a TOL" (Goodall et al., 2009, p. 12).

The use of decision-aids and information in making decisions regarding the method of delivery following a previous cesarean section was examined (Frost, Shaw, Montgomery, & Murphy, 2009). Initially, it was a study designed to determine the effects of two decision making aids on areas including anxiety, decision making conflict, knowledge, birth mode preferences, and the actual delivery outcome. A purposive subsample of 30 women due to deliver within a five month period was obtained from a sample of 742 women who participated in a larger study of decision-making aids. The researchers aimed for maximum variation in the sample in regards to place of delivery, types of educational intervention, the type of previous cesarean (emergency or elective, and consistency between preferred and actual type of delivery. Thirty agreed to a prenatal interview at approximately 37 weeks of gestation. The sample was assigned to various approaches as follows; 14 women were assigned to an information program, where information regarding mode of delivery was given via a computer program; 14 were assigned to an individualized decision analysis program that would recommend a mode



of delivery based upon probabilities; two women who received the usual care, or verbal counseling, were included for comparison.

At the 37 week interview, women who received the informational program shared the information that they received assisted them in decision-making, and served to provide a framework for further individual research and/or healthcare provider conversations. Women who participated in the decision analysis program identified that it was a starting point for further research. However, for a minority of participants, they stated that it had led to a degree of uncertainty, as it was unclear how this could assist them in making a decision, it did not seem to take into account individual circumstances, or that they did not agree with the suggested mode of delivery. This contributed to a perception of increased risk. Overall, women did value some form of structured informational program when deciding upon a mode of delivery after a previous cesarean section, and it was deemed valuable to accompany verbal VBAC counseling.

Twenty-two of the original 30 women were interviewed during the postpartum period (approximately 6-8 weeks postpartum). The eight that were unable to participate declined due to moving or lack of time. Women who participated in the information program found that it had contributed to their perception of “informed choice”. Women who had used the decision analysis program found that the information program was helpful when their delivery did not go as they had hoped, as they had a better understanding of the entire process.

Meddings et al. (2007) utilized a phenomenological approach to explore the lived experience of women who elected a TOLAC. Eight women from the UK, recruited by local midwives, participated in the study. Inclusion criteria were that women had

experienced a cesarean delivery in a previous pregnancy, and planned to have a vaginal birth in the current one.

Two interviews were held with each participant. An antenatal interview was held after the 34<sup>th</sup> week of pregnancy in the participant's home, and a postpartum interview was held after six weeks postpartum. These interviews were scheduled deliberately after decisions regarding mode of delivery had been made, and after allowing enough time for postpartum recovery. The semi-structured interviews were facilitated by a topic guide, tape recorded, transcribed, and analyzed for themes. Two or more researchers analyzed the transcribed interviews.

The prevailing theme was informed choice. Women identified that informed choice was important to them, and most women (it was not identified how many) believed that they were involved in the decision regarding the mode of delivery. This involvement in decision-making resulted in increased levels of confidence in the women, as well as increased levels of trust in their providers.

A second theme involved the differences in postpartum recuperation. Women who experienced both types of birth concluded that the cesarean recovery was longer and more painful.

The third theme that emerged was in regards to bonding with the infant. Some women (it was not mentioned how many) felt that there was no difference between bonding with their infants whether born cesarean or vaginally. Other women believed there was a difference.

One limitation of this study involved the sampling method. The authors noted that the research team did not have ultimate control over the group composition, and this

resulted in the group not being reflective of the community's ethnic make-up. Another limitation involved the reporting of the results. It was difficult to ascertain how many women were successful in their VBAC attempt, though there was made mention of one TOLAC that resulted in cesarean. The mode of delivery could impact the degree to which women felt they had informed choice, especially since these participants were all interested in experiencing VBAC. The authors used the terms "most" or "some" to report their results. More specific numbers and mode of delivery information would have facilitated an evaluation of the findings of this study.

Phillips et al. (2010) interviewed 20 Australian women who had experienced a previous cesarean and a subsequent birth. The participants were consecutively enrolled using medical records. Of these 20 women, 16 experienced elective cesarean section, two experienced failed TOLAC, and two experienced VBAC. The authors indicated that the women could be divided into three groups based on a continuum of beliefs regarding birth. At one end of the continuum were the very pro-VBAC mothers, and on the other end were the very pro-elective cesarean mothers. The women who elected to deliver by cesarean were in between the two groups. The specific focus of this study was on the reasoning that motivated those four mothers who attempted a TOLAC.

Data was collected through an iterative phenomenological qualitative research method using open-ended interviews. These interviews were conducted at a location chosen by the woman, and were held at a time that was convenient for her. The tape-recorded interviews were conducted by a researcher, and were transcribed verbatim by an assistant. The language texts were then entered in QSR NUD\*IST program. Themes were

then analyzed; coding was done with a researcher and team of assistants, with all being in complete agreement as to coding and themes.

While this sample of four was small, the researchers concluded that it was appropriate for a homogenous group, with the homogeneity being related to a desire for VBAC. Two of the mothers had a VBAC, and two experienced a failed TOLAC. After examination of the participant interviews, three themes emerged.

The first theme pertained to the four women and their “maternal instinct about what is best for the baby” (Phillips et al., 2010, p. 80). Whether they experienced a VBAC or failed TOLAC, the women held a strong belief that a vaginal birth was best for their newborn.

The second theme that emerged was that of “passionate and determined women who believe in choice and natural birth” (Phillips et al., 2010, p. 80). The four women spoke passionately about wanting a natural birth, and valued the opportunity to choose to attempt a vaginal birth. They were single-minded and determined in their interest to attempt a vaginal delivery, and clearly communicated their wishes during labor.

The third theme was in regards to “the positives of trying for or achieving a VBAC” (Phillips et al., 2010, p. 81). The participants spoke positively of the TOLAC experience, even if it did not result in VBAC. For those that did have a VBAC, it was an empowering experience.

This study added new knowledge regarding a little-known topic. However, two facets of this study resulted in some confusion over who and what was the focus of the study. There were originally 20 participants. While their views were considered in the

explanation of the continuum of beliefs, their experiences were not part of the overall study.

McGrath, Phillips, & Vaughan (2010) used the same database of women for a second study. This study explored the frustration experienced by women who wished to have a vaginal delivery but delivered by cesarean. The initial group consisted of 20 women with a prior cesarean who were consecutively enrolled through hospital delivery records. In this group of 20 women, two delivered by VBAC, two experienced a failed TOLAC, and 16 chose elective cesarean section. For this study, the final sample consisted of six women who valued a vaginal birth but delivered by cesarean, and two women who experienced a failed TOLAC.

One theme that emerged was in regards to the misperception that cesarean was the “easy option”, as some women did not have the option of choice about their birth method (McGrath et al., 2010). One mother stated that a motivating factor for participating in this research was to correct this perception. Furthermore, these women philosophically distanced themselves through the interviews from other participants who preferred a cesarean for convenience.

A lack of choice was another theme that emerged from the interviews. These participants perceived that due to clinical or physical reasons, they were unable to choose a vaginal birth. Fears surrounding safety and the ability of the mother and child to survive delivery impacted their decisions. The desire to deliver vaginally was in conflict with a loss of confidence in the ability of their bodies. This loss of confidence was not as a result of fear of labor, but rather the difficult first births they had experienced. The mothers expressed a desire to deliver vaginally, verbalizing frustration and disappointment with

not being able to, and reporting a sense of failure. Women who did not attempt a TOLAC shared feelings of regret.

The participants expressed a strong desire to tell their story, and have their story shared with others. The sharply declining rates of VBAC make it all the more important that these stories are told (McGrath et al., 2010).

Fenwick, Gamble, & Hauck (2007) investigated the childbirth expectations of women with a prior cesarean, who had attempted or were planning to attempt a VBAC. A qualitative descriptive explorative design was used. The participants were recruited from western Australia community newspaper advertisements. There were initially 157 phone respondents, of which 107 were contacted and interviewed. There were 35 phone interviews with women who had either experienced VBAC, or would choose to do so in a subsequent pregnancy. Of these 35, 23 had experienced a subsequent labor after their cesarean, with 14 having a VBAC, and 9 having repeat cesarean.

Women were interviewed by telephone. After obtaining demographic information, reproductive history, parity, time since last delivery, clinical indications for the primary cesarean, type of care provider, and place of delivery, the women were asked to discuss their childbirth experiences and expectations. They were asked to share their insights on the benefits of vaginal birth and cesarean, and to explain what makes a satisfying birth experience. The phone interviews were tape-recorded, transcribed, and the researchers kept field notes. The transcriptions were coded, concepts were regrouped, and organized. The resulting organized concepts were discussed with colleagues, and the preliminary findings were shared with peers. Audit trails were constructed to explain the reasoning of the researchers.

The findings were that women valued vaginal birth, and their desire to have a vaginal birth was strengthened by having a cesarean. Factors that influenced their birthing choices included: believing that birth was a normal process, and that experiencing it was an important part of being a woman and mother. Many women who had either experienced or wanted to experience VBAC verbalized being supported in this decision by friends and family. The women reported that the cesarean experience had made them feel powerless. VBAC was a way of participating in the birthing process, and having a semblance of control. Maternal and fetal well-being was mentioned as being the major benefit of VBAC. Cesarean was considered to a “physical, emotional and lifestyle disruption that was risky and had potential to cause harm to mother and baby” (p.1566). For the study participants, the opportunity to experience birth was a spiritual, emotional and physical life event, and was so significant that it “mediated against the pressure of medical discourse promoting cesarean” (Fenwick et al., 2007, p.1561).

Lundgren, Begley, Gross, & Bondas (2012) conducted a metasynthesis of eight qualitative studies of women’s experiences of VBAC. The sample included peer-reviewed studies published between 2002-2010 from the disciplines of nursing, psychology, and midwifery.

After literature searches were conducted, 22 qualitative studies were screened. After further review, 11 were excluded for they either did not have a primary focus related to the experience of women, or the focus was solely on the CS experience as it related to the VBAC experience. A 32- item consolidated criteria for reporting qualitative research (COREQ) checklist was used to assess each study, and the authors subsequently incorporated additional criteria important to qualitative research to further evaluate the

each paper. After this checklist review, three studies were excluded due to meeting the standards of minor quality, leaving eight that met the standards of medium quality. No studies were found to be of high quality based upon their assessment standards.

The eight studies in the final analysis were from three countries. Four studies were from Australia, three were from the UK, and one was from the US. The aims of the studies varied. They included the investigation of the decision making process, the role of the healthcare provider in the decision, reasons for trying a VBAC, experiences of choosing VBAC, the experience of VBAC, and the experience of RCS when attempting VBAC. Overall, there were 94 participants, but some subjects were duplicated in three studies.

The main findings of this metasynthesis involve the decision making process being fraught with inconsistent information being shared with women, and difficult for women to navigate. It was concluded that VBAC is seen as a risky undertaking, with the “positive aspects of vaginal birth are mainly described by the women and not the health care system” (Lundgren et al., 2012, p. 10). Women viewed VBAC as empowering, and important to them and their babies. It was recommended that additional studies be done from a wider range of countries, and that healthcare professionals provide women with evidence based information of risks and positive benefits of VBAC.

### **Chapter Summary**

Gender based oppression exists in all aspects of women’s lives (Klima, 2001). Oppression is evident in the medicalization of pregnancy, manipulation during the informed consent process, the exaggeration of risk, the loss of VBAC as an option



resulting in unnecessary cesarean sections, and in the lack of research regarding women's experiences.

The scientific literature pertinent to cesarean and VBAC and TOLAC has been extensively and chronologically reviewed. This critical analysis of literature has identified numerous problems with the TOLAC and VBAC scientific literature including: a predominance of retrospective designs, significant variation in inclusion and exclusion criteria, inconsistent definitions of uterine rupture and uterine dehiscence, historical variation in modes of induction, augmentation, uterine scar suture techniques and materials, all of which have had significant and unintended consequences on clinical practice and women's birth options.

In reality, the incidence of uterine rupture, the area of most concern, is quite small in appropriately selected VBAC candidates. The exaggeration of risk of uterine rupture has led to a progressive decline in access and availability of VBAC. As a result, fewer women are offered VBAC and more women are undergoing unnecessary ERCS, which has both short and long-term consequences for women and their children.

Furthermore, in comparison, the risks of RCS are not as well identified in the literature, and the benefits of VBAC are not as extensively studied as the risks. Achieving a balance between risks and benefits, without sincere commitment to achieving a VBAC, sets women up for "token" trials of labor that end in assuming the risk of operative birth (Shorten, 2010).

## **Gaps in the Literature**

The literature regarding VBAC, while extensive, heavily represents quantitative research that emphasizes risk and negative outcomes. Additional quantitative research regarding maternal and neonatal benefits of a TOLAC and VBAC is needed.

Despite the proliferation of research regarding TOLAC/VBAC, there is very little qualitative research regarding the experience of VBAC from the woman's own perspective, or pertaining to psychosocial benefits of VBAC. Research utilizing the insights of women who have experienced VBAC constitutes a significant gap in the literature. To date, the VBAC stories of American women have not been studied and published in the scientific literature.

The proposed study of VBAC stories will provide insight into the psychological, physical, and spiritual aspects of VBAC as perceived by the women who have experienced them. This insight will result in an opportunity to reassess current practice, promote a more balanced view of VBAC, and contribute additional knowledge in an area that is needed.

## **Assumptions of the Study**

1. Feminisms share three basic principles including recognizing the oppression of women, valuing women and their experiences, and seeking social change (Hall & Stevens, 1991).
2. Gender based oppression exists in all aspects of women's lives (Klima, 2001).

This oppression extends into healthcare and related research, as women

historically have been excluded due to concerns that the menstrual cycle and pregnancy were research confounders. As a result, their interests have been overlooked (Hall et al., 1994; Thorne & Varcoe, 1998).

3. Women are vulnerable to oppression and marginalization within a healthcare system that historically devalues women. The patriarchal culture of medicine has flourished in the last several hundred years, resulting in the medicalization of childbirth (Cahill, 2001).
4. Pregnancy and childbirth have been constructed by the dominant medical profession into a problematic event involving great risk (Baker et al., 2005; Jordan & Murphy, 2009). Research regarding VBAC reflects this focus on risk, though the research is plagued with inconsistent definitions and methods. This perception of risk has contributed to higher rates of cesarean, lower rates of VBAC, and a proliferation of research emphasizing the risk of VBAC.
5. If advised that a cesarean is in the best interest of their babies, most women will submit to the recommendation (Kitzinger, 2005). Women who might otherwise elect to attempt a VBAC may be dissuaded by their health care providers, whose personal interests and fears about liability may alter the informed consent process. In short, women are manipulated into making healthcare decisions based on incomplete and biased information regarding risk and benefits (Beckett, 2005).
6. The researcher believes that women do not consistently receive comprehensive informed consent prior to making decisions regarding a TOLAC or ERCS. As a CNM, the researcher has been a resource to women who are making decisions

regarding their mode of delivery after cesarean. The researcher has personally experienced cesarean section, and while appreciative of the benefits that cesarean can provide, understands many of the short term and long term sequelae of this delivery method. The researcher's personal pregnancy and delivery history was not disclosed to participants until after the interview, if at all, to avoid biasing participants' comments.

7. Inherent in feminist theory is a valuing of the subjective, exemplified in the use of women's narratives or stories, which presents their lives and experiences (The Personal Narratives Group, 1989). Studying women's perceptions of cesarean and VBAC, through the use of their stories as data, utilizing a feminist perspective, has contributed additional knowledge regarding childbirth.
8. Women have suffered psychologically from surgical birth, and have described VBAC as a healing experience (Bainbridge, 2002; Fenwick et al., 2003). Women value the opportunity and experience of TOLAC, even if it results in RCS (Chigbu et al., 2007; Cleary-Goldman et al., 2010; Phillips et al., 2010). Long term maternal psychosocial outcomes following VBAC, unsuccessful trial of labor, and elective cesarean section represents a critical gap in the evidence (Cunningham et al., 2010a). This study was designed to contribute valuable knowledge regarding the comparative experience of cesarean and VBAC.

### **Research Questions**

As discussed in this chapter, research regarding VBAC is predominantly quantitative in nature. The study of women's perspectives of their VBAC experiences constitutes an identified gap in the evidence (Cunningham et al., 2010a). In order to

address this gap in the evidence, the following research questions have been identified and studied:

1. How will women describe their experiences of VBAC?
2. How will women compare their experiences of CS with VBAC in their birth stories?

### Chapter 3 Research Design and Methods

This qualitative study explored the participants' experiences of VBAC and compared these experiences with those of the participants' prior cesarean births using women's birth stories, or narratives, as the source of data. A feminist perspective was used throughout. In this section, the use of narratives, or stories, within research is discussed. The relevancy of this research method is outlined, particularly as it pertained to the study of women, and their birth experiences.

The word "narrative (narrate)" is derived from the Latin "gnoscere (noschere)" which means "to know". Life itself has been described as a narrative, with individuals organizing their experiences into meaningful stories to be shared (Berger, 1997). The terms "narrative" and "story" are often used interchangeably within qualitative research. For the purpose of the study, the term "story" was utilized.

The study of stories was long discounted as a research method, but has been more recently recognized as a "respectable academic topic" (Aranda & Street, 2001, p. 83). The study of stories is a method of "integrating transformative moments in human experience" (Callister, 2004b, p. 484). It is used in nearly every profession and discipline, as researchers strive to discover the essence of the human experience (Personal Narrative Group, 1989).

The use of stories within research impacts the researcher through the interview and interpretive analysis by attracting attention to the issues that are revealed, resulting in the reader reflecting about significance by personal involvement, ultimately transforming the reader (Van Maanen, 1990). However, the sharing of stories also impacts the research participant. Stories reveal the truth of the individual's experiences as they perceived them

to have occurred, and offers readers the opportunity to learn from the stories. For sharing of stories can serve as a method of healing (Sandelowski, 1994) and of gaining new insights into life experiences.

A critical mass of knowledge regarding the lives of women is missing throughout history (Mountford, 2003; Personal Narrative Group 1989). The emphasis of history has been reflective of the experiences and opinions of the male culture (Belenky et al., 1986; Personal Narrative Group, 1989). Historically, the voices of women regarding their experiences have been silenced and overlooked (Thorne & Varcoe, 1998). One area of research that is in “dire” need of investigation is that of the childbirth experience (Savage, 2001). Despite the richness of knowledge that is gained through story research, there is minimal research regarding anecdotes, narratives, and stories regarding pregnancy and birth (Carolan, 2006).

“Birth stories are everywhere” (Bylund, pg. 23, 2005). Though women have verbally shared their birth stories for as long as they have birthed children, the research and exploration of birth stories is a relatively new area of inquiry. There are numerous benefits to sharing and studying birth experiences.

The sharing of birth stories offers women opportunities to integrate the experiences into their lives, bond with other women, discuss fears and concerns regarding birth, understand their own personal strengths, and experience connections with other women (Callister, 2004a). Birth stories can serve as view into the past, can impact decision making regarding the future, and can affect how individuals are socialized about birth (Sterk et al., 2002). Healthcare providers may gain insight into their practices and the impacts on women (Harrod, 1998; Simkin, 1991; Simkin, 1992; VandeVusse, 1999a;

VandeVusse, 1999b). This insight may result in policy and institutional changes (Lee & Lamp, 2005). Listening to birth stories can enhance the learning of students, and serve as a method for integrating theoretical concepts (Lee & Lamp, 2005).

A feminist perspective was used in this qualitative study. As discussed in the previous chapter, a feminist perspective includes recognizing the oppression of women, valuing women and their experiences, and seeking social change.

Central to feminist research is the “appreciation and respect for the uniqueness of the experience of each woman, and the desire to present these unique experiences in a way that gives power to those without equal power in our society “(Torkelson, 1996, p. 124). Oakley’s feminist approach to the research interview was used. This approach includes the researcher presenting her own identity during the interview, with the reciprocity established facilitating additional insights from the participant. This interaction results in a participatory type of research which produces work that challenges the stereotypes usually assigned to the researcher and the participant (Landman, 2006). Ultimately, learning about the comparative experience of cesarean and VBAC can serve to enlighten those who provide care to women, resulting in increased knowledge and understanding for childbirth choice, and advocacy for increased availability of VBAC for all women.

### **Sample**

The study of birth stories of women who have experienced VBAC was purposively sampled from community hospitals and tertiary centers. The researcher made deliberate decisions to add diversity of settings. There were no requirements regarding education level, race, marital status, socioeconomic status, religion, sexual preferences, or



whether the woman's birth was attended by an obstetrician or Certified Nurse Midwife (CNM).

Participants were sought through letters to the offices of Certified Nurse Midwives (CNMs) and obstetricians who practice in the southeastern area of Wisconsin (Appendix A). Contact information for the CNMs and obstetricians was obtained through the Yellow Pages and the American College of Nurse Midwives' Membership Directory.

The first contact with the healthcare providers was through a letter of introduction and explanation sent to the offices of obstetricians and CNMs, requesting their assistance by posting information regarding the research project (Appendix A). Enclosed with the letter was a flyer (Appendix B) regarding the project, along with the researcher's contact information, to be posted in various locations within their offices. In addition to posting the flyers, some physicians and CNMs spoke about this study to their clients that met the inclusion criteria.

After women responded by phone as a potential participant, the researcher informed her of the purpose of the research, how the data would be used, answered any questions she had, and reviewed the inclusion criteria. Inclusion criteria included that participants would be at least 18 years of age, have experienced at least one cesarean section, and at least one VBAC. Children born from those deliveries should be living and in good health. The participant needed to be fluent in English. For the purpose of this study, the time limit between the VBAC and interview was less than 5 years.

While it has been shown that women accurately and vividly recall delivery details for 15-20 years (Simkin, 1992), this time limit of five years was set due to the current state of VBAC. While VBAC was encouraged in the mid-late 1990s, as explained

in Chapter 2, numerous barriers were placed in the 2000s. The researcher decided that through the sharing of birth stories from the last five years, barriers to VBAC, and solutions to those barriers could possibly be identified.

Once the inclusion criteria was reviewed and confirmed, and the woman consented to participate, the interview was scheduled at a time and place that was convenient for her. Participants were encouraged to pick a location that made them most comfortable in which they could easily converse. Six women requested that the researcher come to their home, one preferred her office, and the other six asked that we meet in various coffeehouses. The participants were informed that there were no time limits for the interview/data collection. The total time spent face to face ranged from approximately 30 minutes to 2 1/2 hours. Consent for participating in research was obtained and documented at the scheduled face-to-face interview (Appendix C and D).

Power differences exist when there are inequalities in education, socioeconomic status, and healthcare levels between the researcher and participant (Dancy et al., 2004). This power difference can result in mistrust. However, as discussed previously, Oakley's feminist approach to the research interview was utilized. The researcher introduced herself as a CNM, a mother, and actively listened to what was shared by the participant. The researcher's personal pregnancy and delivery experience was not shared with the participant until after the interview was concluded, if at all. This was done to decrease the risk of possibly biasing participants' responses, and resulted in a more participatory and conversational interview.

Sample size in qualitative research cannot be determined by computation or power analyses (Sandelowski, 1995). Rather, the aim of the sampling and the research

method should determine whether the data is complete (Sandelowski, 1995). While a sample size of 10 may be too large for some types of narrative analyses, it has been noted that beginning researchers often need more participants to discover the phenomena (Sandelowski, 1995). In previous qualitative VBAC studies utilizing interviews as data, sample size has ranged from 4 to 35. Larger samples sizes tend to reflect more brief interviews and smaller samples tend to be obtained for more in depth narrative studies. The researcher had initially planned for 12 interviews. By the eighth interview, thematic saturation occurred. An additional 4 interviews served as verification. After the conclusion of the 12<sup>th</sup> interview, the researcher received a phone call from a participant who was also interested in sharing her story. For this comparative study, the final sample size was 13.

### **Data Collection Methods**

After meeting each participant at the time and location of her choice, she was informed of the purpose of the research and assured of confidentiality. Formal written consent was obtained on two forms, and one copy was given to the participant. Each participant was informed of her right to withdraw from the study at any time. The individual interviews were audiotaped, using two separate machines to provide backup in case one malfunctioned. Participants were asked to share their cesarean and VBAC experiences. A skilled and experienced medical transcriptionist transcribed all interviews. Data collection took place within a single interview with no specified time limit. The participant was invited into the interview with the question/statement: “Tell me about your cesarean and VBAC experiences in any way that you wish”.

Demographic information was obtained at the time of the interview that included age, race, education level, marital status, dates/places of deliveries, and type of health care provider at delivery (Appendix E). Field notes were written after each interview, describing the researcher's observations of the woman's reactions to the interview.

The researcher has kept the tapes and transcripts in a locked, secure location, maintaining confidentiality of the participants. Potential identifying information such as the names of the participants, their family members, providers, and the facility where any delivery occurred as well as the date of any delivery were excluded from the transcripts. Each transcript was given a number, and a link between the participant name and number was kept in a locked file in the researcher's locked home office. Both paper and electronic copies of the transcripts have been maintained. The paper copies were single spaced with a three-inch margin for hand coding and making interpretive coding notes. To enhance reliability, the interview transcripts were cross-checked for accuracy by the researcher several times by listening to the audiotapes while simultaneously reading the transcripts line by line. This process was repeated during data analysis, and will be outlined in a subsequent section.

### **Methodological Rigor**

“Without rigor, research is worthless, becomes fiction, and loses its utility” (Morse, Barrett, Mayan, Olson, & Spiers, 2002. p.2). Therefore, much attention has been given to the concepts of rigor, reliability, and validity in all categories of research (Morse et al., 2002). In this section, methods that were employed to assure rigor within qualitative research are outlined. As this qualitative study has a feminist perspective, methods used to assure rigor within feminist inquiry are also discussed.

In their classic work, Lincoln & Guba (1985) substituted the term “trustworthiness” within qualitative research for reliability and validity. There are four components that are inherent within “trustworthiness” including credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985; Morse et al., 2002; Thomas, & Magilvy, 2011).

Credibility is the component that allows others to understand the experiences contained in the study through the participant’s experiences. In order to establish credibility in this study, the researcher reviewed each transcript several times while listening to the audiotaped interview, searching for similarities within and between participants and their experiences. The words of women were also used to strengthen the credibility of this study. In addition, the researcher reviewed the coding, findings, and themes with two members of the committee to further strengthen the credibility of the findings.

Transferability, or applicability, refers to the ability to transfer research findings from one group to another (Thomas & Magilvy, 2011). In this study, this was demonstrated by describing the demographics of the participants, their geographic locations, the type of hospitals they delivered in, indications for their cesareans, the type of healthcare provider they had for the VBAC, the use of epidural anesthesia, and the length of time since their cesarean and VBAC.

Dependability is demonstrated when one researcher can follow the audit trail of another (Thomas & Magilvy, 2011). In this study, dependability was demonstrated by providing the dissertation chair with a detailed description of the research methods, and keeping records of the analytic process. An audit trail was developed. An audit trail is a

“systematic collection of materials and documentation that would allow an independent auditor to come to conclusions regarding the data” (Polit & Beck, 2012, p.591). This audit trail consists of the interview transcripts, data reduction notes, field notes, and iterative drafts of the final report (Polit & Beck, 2012; p.591).

Confirmability is the result of credibility, transferability, and dependability being established (Thomas & Magilvy, 2011). Throughout the process, the researcher was reflective, self-critical, and self-aware as to her own biases, taking measures to strengthen credibility, transferability, and dependability of the study.

“Rigor in feminist inquiry includes the degree to which research reflects the complexity of reality” (Hall & Stevens, 1991, p. 23). This complexity of reality for the 13 participants was reflected in the diversity of their backgrounds, their pregnancy and delivery experiences, and in the wide range of identified subthemes. Rigor in feminist research is best evaluated by standards that address the adequacy of the entire inquiry, relative to the purpose of the study (Hall & Stevens, 1991). This level of adequacy was addressed by the researcher throughout the study by continuously analyzing the data while reflecting upon the research questions.

Rapport is necessary between the researcher and participant, as this reduces the power inequalities between the two, facilitating a more open and meaningful dialogue (Hall & Stevens, 1991). This rapport was facilitated through the researcher demonstrating genuine interest in each woman’s experiences, being respectful of her ability to share information, and being grateful for her sharing of time and effort (Hall & Stevens, 1991; Landman, 2006; Oakley, 1981). The process of building rapport began with the first phone contact with the participant during which the study was explained, a meeting was

set up at a time and place of her choosing, and she was thanked by the researcher for her time. Upon meeting in person, the process continued through a period of informal conversation prior to the informed consent process. The process of building rapport continued through the interview through a conversational tone, and the researcher's genuine interest in the participant. Once the participant had finished and the audiotapes stopped, she was again thanked for her time and sharing of her story.

**Researcher Bias.** The researcher, while being supportive of a woman's right to choose a TOLAC or a repeat cesarean, is a strong proponent of VBAC. The researcher believes that women do not consistently receive comprehensive informed consent prior to making decisions regarding a TOLAC or ERCS. As a CNM, the researcher has been a resource to women who are making decisions regarding their mode of delivery after cesarean. The researcher has personally experienced cesarean section, and while appreciative of the benefits that cesarean can provide, understands many of the short term and long term sequelae of this delivery method. The researcher's personal pregnancy and delivery experiences were not shared until after the conclusion of the interview, if at all. This was done deliberately to keep the focus on the research participant during the interview. These identified areas could be sources for potential bias in this study.

**Bracketing.** Bracketing is a method used in qualitative research by which researchers acknowledge their prior knowledge and experience with the area being studied, and continue to be aware of this prior knowledge throughout the entire research process (Morse & Richards, 2002; Tufford & Newman, 2012). In order to maintain the value of a study, the type of bracketing should be identified (Gearing, 2004). Reflexive cultural bracketing was utilized in this study. The focus of this type of bracketing is to

clearly identify the researcher's values, history, culture, and background before the investigation (Gearing, 2004).

Prior to meeting with participants, the researcher took time to reflect upon her background as a patient advocate, nurse-midwife, researcher, and mother. As previously mentioned, the researcher believes that women do not consistently receive unbiased information prior to making a decision about whether to have a VBAC or RCS. In all but one instance, the researcher personally knew the physicians or nurse midwives that cared for the women during their pregnancies or labors resulting in VBAC. The researcher is employed at a facility in which several of the primary cesareans and VBACs occurred, and has intimate knowledge of the institution's culture, guidelines, and policies. As a doctoral student, the researcher has extensive knowledge regarding the risks and benefits of VBAC, and is aware of previous qualitative research that has been done in this area of study. The researcher experienced a high risk pregnancy and emergent cesarean, did not have a second pregnancy, and therefore did not have the opportunity to VBAC. The researcher also acknowledged that by participating in this study, these women were, in all likelihood, looking favorably upon their VBAC experience.

These topics were written down, reflected upon prior to interviews, and again during the review of transcripts and audiotapes. The researcher made every attempt to remain neutral. This was done by reflecting upon her role as a researcher and student, being aware that she was no longer in the role of employee or colleague.

### **Data Analysis**

When analyzing qualitative data, there is a balance to be sought between the rigor of essence discovery and mindfulness to detail (Sandelowski, 1993). Qualitative analysis



begins with the reductionist organization of data (Polit & Beck, 2012). During reading of transcripts, which was often accompanied by simultaneous listening to the audiotapes, notes were taken regarding impressions and possible categorizations of data.

Categorization is a widely used procedure, and it is known to be a fluid process which may be added to or changed as the process of data organization and analysis progresses (Polit & Beck, 2012). It involves mindful reading, attentiveness to detail, and finding individual and clustered concepts within the data. These concepts were given a label that forms the category (Polit & Beck, 2012, p. 558).

Coding of data was done entirely by the researcher. Following the initial development of 8 categories and 39 subthemes, the data was then reexamined. All transcripts were reviewed again while listening to the audiotapes. Exemplar participant quotes for the themes and subthemes were extracted from the transcripts. After this review, themes and subthemes were reexamined, and discussed with the researcher's dissertation chair and another committee member for confirmation. This review and discussion resulted in the development of 4 themes and 21 subthemes that seem to adequately summarize the data.

### **Provisions for the Protection of Human Rights**

This study was submitted for IRB approval through Marquette University. Participants were protected from emotional harm during the research by the offering of debriefing sessions during which they could ask further questions after the conclusion of the interview.

For those who are sharing their birth experiences, study participation may result in revisiting a time when they were psychologically, emotionally, and/or physically

vulnerable. This may result in the uncovering of emotionally laden memories (Anderson & Hatton, 2000), and participants were informed that this was a potential effect of participation. Referral resources were available for those participants who might have experienced psychological distress after sharing their birth story. These resources included support groups from Milwaukee and Waukesha counties, as well as referral to a MCW psychiatrist specializing in women's mental health issues. However, no participants needed these referral resources.

Participants were assured of the confidentiality of their information, and the methods employed in the protection of it, including de-identification of their data. They were informed of their right to refuse to participate during any point in the process, to refuse to answer questions, or to withdraw completely from the process without fear of retaliation. No participant ended her interview before she indicated that she was done. Participants were treated respectfully, courteously, fairly, and without prejudice during all stages of the research process (Polit & Beck, 2012).

### **Limitations of the Study**

Diversity of health care providers is desired in this study, so both CNM and physician patients were interviewed. All participants were obtained from southeastern Wisconsin. Therefore, the limitations of the geographic area were reflective of regional practice influences.

Qualitative sample sizes are generally small (Ritchie, Lewis, & Elam, 2003). As discussed previously, the researcher had initially planned for a sample size of 12. Thematic saturation occurred by the eighth interview. Upon completion of the twelfth

interview, the researcher was contacted by a woman who was interested in sharing her story. The additional interviews served as verification.

The sample included only English speaking participants. Efforts were made to seek diversity in the types of healthcare providers, clients, and healthcare delivery settings.

### **Chapter Summary**

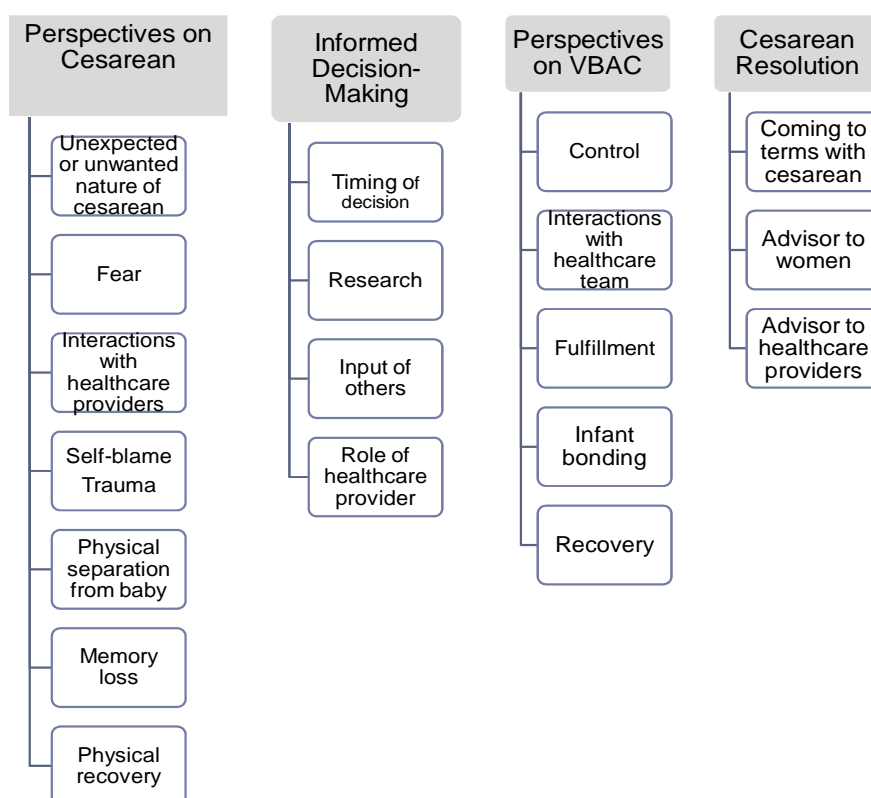
Throughout the research process, consistent with a feminist perspective, women and their interests remained central. It was the intention of the researcher that women feel valued and validated through participation. After obtaining an appropriate sample, studying transcripts, listening to audiotapes numerous times, using iterative coding, themes and subthemes were identified and reviewed with faculty. In Chapter 4, the findings of the research are discussed.

## Chapter 4 Findings

This chapter contains the study findings. The demographics, obstetric, cesarean birth and VBAC history of the participants are described first. Participants were generous in sharing of their time, experiences, and perspectives. In keeping with the feminist philosophical framework, quotes of the participants are used to describe their perspectives. Four major themes emerged from the analysis of participant descriptions of their prior cesarean and VBAC experiences. These include perspectives on cesarean, informed decision-making, perspectives on VBAC, and cesarean resolution. Each theme and its related subthemes, shown in Figure 3, will be described, followed by exemplar quotes from participants.

Figure 3

### *Themes and Subthemes*



## Demographics

Thirteen participants ranged in age from 24 -40, with a mean age of 30.9 years. Nine were married, and four were single. The education levels of participants varied, with two identifying themselves as high school graduates, four reporting some college, one with an associate's degree, one with a Bachelor's degree, four with a Master's degree, and one with a Doctorate. Three participants identified themselves as African American or Black, and 10 identified themselves as Caucasian or White. Three had received care from CNMs at some point during their pregnancies or birth, and 10 exclusively saw obstetricians. Participants experienced VBAC at five hospitals in southeastern Wisconsin. Three of the hospitals were tertiary level hospitals, and two were community hospitals. Eleven of the VBACs occurred in tertiary settings, and three occurred in level 2 community hospitals. One participant had experienced 2 VBACs. Two participants were pregnant at the time of the interview, and both were planning on another VBAC.

The indications for each participant's cesarean are outlined in Table 31. The time between cesarean, and the time since the VBAC are also presented in Table 31. The length of elapsed time since the last cesarean ranged from two years to seven years. The time from the last VBAC (one participant had experienced two VBACs) ranged from one month to three years. Nine participants had experienced VBAC within the last year prior to their interviews.

Table 31 *Participants' Obstetric History*

| Participant | # of Prior NSVDs | # of Prior CS | # of VBAC | Cesarean Preceded By Elective Induction | Indications for Initial Cesarean (s)                  | Time Since CS (yrs) | Time Since VBAC | Epidural for VBAC | VBAC Attendant |
|-------------|------------------|---------------|-----------|---|---|---------------------|-----------------|-------------------|----------------|
| 1           | 0                | 1             | 1         | No                                      | Breech in labor                                       | 4                   | < 1 yr          | no                | Physician      |
| 2           | 0                | 1             | 1         | No                                      | HELLP   | 5                   | <1 yr           | yes               | Physician      |
| 3           | 0                | 1             | 1         | No                                      | Arrest of descent in second stage, fetal tachycardia  | 4                   | <1 yr           | yes               | Physician      |
| 4           | 0                | 2             | 2         | No                                      | Arrest of dilation X2                                 | 5                   | <1yr            | no                | Physician      |
| 5           | 2                | 1             | 1         | No                                      | Placenta previa                                       | 2                   | <1yr            | yes               | Physician      |
| 6           | 0                | 1             | 1         | No                                      | Oligohydramnios, fetal intolerance of labor           | 7                   | 3 yrs           | yes               | CNM            |
| 7           | 0                | 1             | 1         | No                                      | Maternal fever, arrest of dilation                    | 6                   | 1 yr            | no                | Physician      |
| 8           | 0                | 1             | 1         | No                                      | Prolonged second stage, failed forceps, failed vacuum | 2                   | < 1yr           | no                | CNM            |
| 9           | 0                | 1             | 1         | No                                      | Breech at 36 weeks, version attempted, scheduled CS   | 5                   | 2 yrs           | yes               | Physician      |
| 10          | 0                | 1             | 1         | No                                      | Breech at 39 weeks, no version                        | 4                   | < 1 yr          | yes               | Physician      |
| 11          | 0                | 1             | 1         | Yes                                     | Arrest of dilation, fetal intolerance of labor        | 4                   | <1yr            | yes               | Physician      |
| 12          | 0                | 1             | 1         | No                                      | Breech at 36 weeks, no version by maternal choice     | 4                   | 2 yrs           | yes               | Physician      |
| 13          | 0                | 1             | 1         | Yes                                     | Arrest of dilation, fetal IOL                         | 2                   | <1yr            | yes               | Physician      |

### Theme 1: Perspectives on Cesarean

The first theme was perspectives on cesarean. As shown in Figure 4, within this theme were 8 subthemes of the unexpected or unwanted nature of cesarean, fear, interactions with healthcare providers, self-blame, trauma, physical separation from the baby, memory loss, and physical recovery.

Figure 4

*Theme 1: Perspectives on Cesarean*



**Unexpected or unwanted nature of cesarean.** For most (9) of the participants who had experienced a “normal” pregnancy, the cesarean was an unexpected event. One

participant reported “it was totally, you know, a surprise”. In at least two instances, their visions of their desired birth experiences were so strong that they overshadowed information given to them in childbirth classes, which they ignored. The reason stated by one was as follows: “because I don’t really know anyone who has had one [cesarean], and so I just kind of assumed that I’d have a vaginal birth like everybody I knew”. Another stated, “I was like daydreaming about babies and all this other... I’m not going to have that [cesarean]”.

Four women had cesareans at full term that were planned due to a pregnancy complication. Participants expressed their initial disappointment and resistance to the decisions. Even in instances in which a cesarean was anticipated, when women had time to contemplate the process, they described it being unexpected. For example, two women shared their perspectives on the unexpected or unwanted nature of their cesareans when they were diagnosed with term breech presentations. As one explained, “He was frank breech a week before my due date and so that was very, very disappointing for me and it was a hard time”. A second woman with a similar situation reported:

The OB met with me and she’s like, “okay, here are the options, we can do a version you know or you can just schedule a C-section”, and I’m like, “well heck no, I’m not scheduling C-section, let’s get this baby turned.” So I scheduled a version....I was really disappointed that it didn’t work, and so I cried a lot for those couple weeks coming up.

**Fear.** In addition to being unexpected, the process preceding cesarean was accompanied by fear for the wellbeing of themselves or their babies. As one woman stated:

Well, it was kind of unexpected, my [baby] came [preterm]. So, I ended up at [hospital], and it was really no question that it was going to have to be a C-section because of how much



danger I was in. I had [life-threatening condition of pregnancy].

Women explained that fear of potentially negative birth outcomes for their babies

was made clear to them. They viewed this as the rationale for their cesareans:

I had only dilated to 3 and hadn't made any more progress...I just remember hearing the beeping, rapid beeping on the monitor and they were saying that [baby's] heart rate was different and so [baby] was trying to descend but wasn't making much progress, and then [baby] was trying to recover and it was just too difficult of a situation and they didn't want to put [us] at risk much longer.

Another woman had concerns about her baby during labor. She shared the following story:

I went in for ultrasound and my fluid was low in my bag so they had they made me go into labor that day. But my [baby] wasn't cooperating with the contractions, heart rate was dropping. And when they busted my water bag then that's when they noticed there was no fluid in my bag, so they had to put a mask on my face, oxygen machine, and they had said I had to get a C-section.

Some participants' fears were further compounded by less than favorable interactions with healthcare providers. Participants reported that these interactions left them feeling unsupported at a time in which they needed that.

**Interactions with healthcare providers.** Participants shared their perspectives of interactions with healthcare providers during the labor experience leading to their cesarean. Two women who experienced unplanned cesareans shared instances in which their concerns were not heard, or they felt unsupported during labor. The following are examples of the participants' perspectives on interactions with healthcare providers:

I was feeling a lot of pressure and I kept saying to the nurse...I feel kind of like I have to go to the bathroom and she was like well, you know that's probably just the baby pushing down and well with each contraction you are just feeling a lot

more pressure and then it kept for another half hour and my contractions were really very strong by that point, so I kept saying I have a lot pressure and I really feel like I have to go to the bathroom so finally the nurse checked me and I was 9 cm. dilated and [baby] was breech and that's when she was like... we're not going to have a vaginal birth. We are going to have an emergency C-section.

Another woman shared her experience with her providers. She shared a story about pushing during the second stage of labor.

It was late at night and I kind of felt a little rushed during the whole thing when I said I was ready to start pushing. I pushed for about 2 and ½ hours and [baby] wasn't coming out. They assumed [baby] was stuck because of [baby's] size cause they thought [baby] was so large and so they took me in for a C-section. At that point I really didn't care.

As reported, some women described interactions that resulted in them feeling unsupported and not heard. Other women blamed themselves for their cesarean.

**Self-blame.** Women expressed feelings of self-blame related to their cesarean.

One woman explained it as, "I just couldn't believe that I was failing...". Other participants blamed themselves for a perceived lack of preparedness for labor, as well as not fully recognizing the risks associated with induction of labor and cesarean. This perception of self blame extended to challenges encountered with a newborn, and the influence that the cesarean may have had on the baby. One woman shared her perspective in the following exemplar quote.

I always feel a regret that I made, I felt like I made [baby] come out early, [baby] had trouble breastfeeding, [baby] had trouble pooping, trouble sleeping, [baby] had reflux. I feel like all these things, if I had [baby] vaginally, would I have saved [baby] from having this... I can't blame everything on the cesarean with this child on that.

**Trauma.** Several women used the word “trauma”, or a related term, to describe their cesarean birth experience. This subtheme of trauma was described as being physical, psychological, and emotional. For one woman, unable to receive an epidural due to a preexisting condition, the process of being put under general anesthesia for an emergency cesarean was traumatic. She had labored to complete dilation with a breech presentation. Another woman, receiving information from a new physician after review of her cesarean records, came to the realization that her first cesarean was probably not necessary. This resulted in feelings of having been put through unnecessary trauma. Another participant shared her memory of the emotional and psychological trauma she experienced while observing her complicated cesarean in an operating room mirror:

We didn't know if he was going to be alive or he would have cerebral palsy, we didn't know if he'd have some kind of nerve damage. So the last thing I saw was his neck wrenching every time they tried to pull, so it was kind of horrific... You know I don't think about it every day but when I do talk about it, I feel shaky and still feel upset.

This perspective of trauma was not only experienced by the participant, but by their loved ones as well. Four women shared that their loved ones had identified the experience as traumatic. One woman stated, “I think he was worried, more worried after the fact you know, he was telling me that ‘I thought you were dying’.” For another couple, the experience was so difficult they decided to wait longer than they had previously intended before becoming pregnant again. For some participants, trauma was further complicated by a physical separation from their baby.

**Physical separation from the baby.** The perspective of cesarean included a physical separation from the baby within the delivery room. The physical separation that was experienced had negative ramifications on bonding and breastfeeding. Furthermore,

it was emotionally distressing and a source of disappointment to the women. One woman shared her perspective in the following words:

I remember not even feeling like I was bonding with the baby because I just frankly, I felt like I could barely get ahold of myself let alone focus on... I remember them bringing [baby] over in the C-section room, and I was just like get that baby away from me, because I'm going to die right now.

Women were distressed by being physically separated from their babies shortly after delivery. At times, this distress was accompanied by memory loss.

**Memory loss.** Five participants described a sense of memory loss, of not being entirely aware of what was happening during the cesarean and for hours following the surgery. Two women experienced the birth and events surrounding it as “a blur”. One participant had general anesthesia and needed morphine postpartum for pain control and stated, “they had me on morphine, basically, for the first 24 hours after my daughter had been born, I don't remember”. Another reported, “I remember going into the Cesarean, I remember seeing her, and that's about it”.

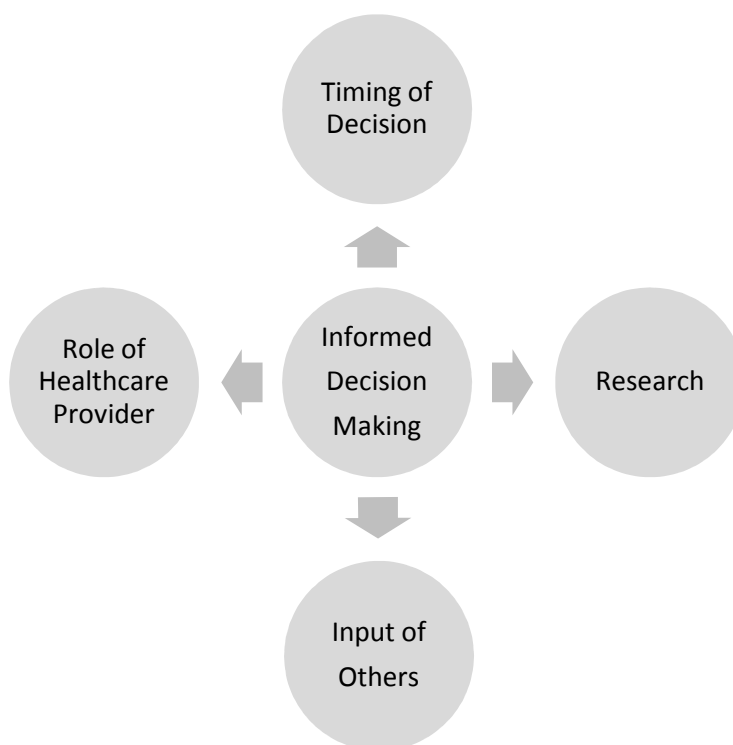
**Physical recovery.** The physical recovery of cesarean was painful, difficult, and accompanied by a need for assistance with self and newborn care. One woman shared, “It was nerve wracking because you're not quite sure which ways you're supposed to move, what you're supposed to do, you're going to hurt your incision, what can you lift, what can't you lift...” . Another woman stated, “Recovery from the C-section was rough. It was bad, but you know I really didn't know any different”. The physical recovery often took longer than women expected. Three women gave estimates of total recovery time that ranged from 8 months to several years.

**Summary.** The perspectives on cesarean were complex. The subthemes of unexpected or unwanted cesarean, fear, interactions with healthcare providers, trauma, self-blame, physical separation from infant, memory loss, and physical recovery were experienced in differing degrees and combinations among participants. Not one participant described their cesarean as a wholly positive experience.

## **Theme 2: Informed Decision Making**

The second theme, shown in Figure 5, was informed decision making. Subthemes included timing of the decision, research, the input of others, and role of the healthcare provider. Each participant described her own individual process of TOLAC decision making. Each woman's story differed in timing of the decision, the research involved, and the weight given to the input of others. However, by far the most influential factor in the decision to have a TOLAC was the role of the healthcare provider sharing information, especially the discussion of risks versus benefits.

Figure 5

*Theme 2: Informed Decision Making*

**Timing of the decision.** The timing of the decision varied greatly among the women. Eleven participants had decided to attempt TOLACs prior to the onset of labor. Four of them described that their decisions to VBAC were made prior to their subsequent pregnancies. One woman stated, “I think I just I wanted a VBAC before I was even pregnant... I just really wanted a completely different experience”. Another participant explained, “I think just automatically I felt after I had my first daughter in a C-section I just knew me and my husband were going to have another one...I was going to do vaginal birth.”

Two women decided to attempt a TOLAC while in labor. Both had planned and scheduled repeat cesarean deliveries. One participant had ongoing discussions with her

physician about VBAC, and she had decided to have a repeat cesarean. However, after going into spontaneous labor, she was again counseled regarding a VBAC and was encouraged by her physician to receive an epidural, get relief from her pain, and then make a final decision:

I kind of on the whim decided let's just do it and you know I got to the hospital at 7 cm. dilated already... And it just seemed that I didn't know which one was the safest route...I didn't want to be selfish in my choice. I didn't want to be like I want vaginal birth...I didn't want to be all about me. I wanted it to be you know the best for the baby and if the C-section would have been best, I would have done it.

The other participant had arrived at the hospital and had planned on a repeat cesarean with a tubal ligation. Though she had experienced other vaginal deliveries prior to her cesarean, she did not think that she could deliver vaginally after a cesarean, as her physician had simply scheduled a repeat cesarean. A different physician was on call when she went into labor:

the doctor that was there when I was in labor she actually kind of mentioned you don't have to have a cesarean 'cause they was prepping for me to do an emergency c-section because my water had broke...and, so I decided to talk it over with my spouse, and I came to the conclusion that I'm going to have him vaginally. I don't want no c-section.

As discussed, women varied in the timing of the decision. The participants also varied a great deal in the range of research that they did in making their decision.

**Research.** Research on VBAC decision-making was highly variable among the participants. Four women discussed how they sought information to assist them in their decision. One woman explained that she was encouraged by reading other women's stories, but that she tried to avoid other internet information that might be frightening or

inaccurate. Another participant shared that, “The ICAN website was key....what totally calmed my fears was reading the book *Silent Knife*”. Another stated, “I started researching when my daughter was about two...doing the internet and then I read the *VBAC Companion*”. Participants’ methods of researching VBAC varied, and they indicated their abilities to filter the information that was most helpful to them. However, they did not filter the input of others, but rather took it into consideration.

**Input of others.** Participants described the input of others in making their decisions to have TOLACs. Participants spoke warmly about the support they received from their partners, understanding that the partners might have their own fears. One woman stated, “He knows how stubborn I am... he better be on my side. I’m on a bandwagon on this one”. Another participant shared that her partner also researched VBAC, “we looked up research together, and we were trying to make the decision mutually but he kept saying this is your body...whatever you want to do it is your body...I’ll support you”. One woman explained that she discussed VBAC with her partner “I talked to him about the pros and the cons but, I don’t know if he just trusted me because I’m the mom or because I’m a medical provider, but... he never questioned my decision”. The partner of another participant was fearful during labor, “so he was just scared, scared about what happens if it happens again, but then once I got in there and started pushing, he was all for it.” Partners agreed with the participants’ decisions, and were reassured at various points in the process. In turn, the participants were reassured by the information they received from their healthcare providers in making their decisions to have VBACs.



**Role of the healthcare provider.** Participants spoke at length about the central role of their healthcare provider in making the decision to attempt a TOLAC. These discussions also involved a discussion of risk, which women consistently remembered as centering on the risk of uterine rupture. Despite the risk of uterine rupture, women were reassured by the balanced information that was shared with them by their healthcare providers. The discussions occurred as early as prior to the first cesarean, began early in the next pregnancy, and were identified as occurring throughout pregnancy and labor. Women recalled feeling encouraged and supported by their healthcare providers in their VBAC decision. One woman shared, “[Healthcare provider] kept telling me ‘you’re young, athletic, you should try this, you should do this. I think that it’s safe for you... you’re a perfect candidate to do a VBAC...’”. Another participant shared the individualized counseling that she received:

So at seven weeks when I went into see [healthcare provider], God bless [healthcare provider], that was one of the first things [healthcare provider] asked ...”you had a C-section. Let’s talk about how you want to deliver”, and before I was even in an exam room, we just sat at [healthcare provider’s] desk in the office....talked about the risk and benefits of each and I just thought that was exceptional in terms of the time spent with the patient... [Healthcare provider] really was extremely thorough, and didn’t you know, sugar coat what the risks were, but given my reasoning for the first C-section, thought I was a good candidate.

One participant had two prior cesareans, one that had followed an unsuccessful TOLAC, and actively sought out a healthcare provider that would support her in her desire to attempt another TOLAC. She was in one physician’s office for a consultation when she received a phone call from another physician who agreed to assist her in a TOLAC after two prior cesareans:

I'm not sure what made me even think about a VBAC was possible. There was a lot of prayer involved I remember that and I'm not entirely sure why I thought this was even an option...I couldn't imagine trying to juggle the family having to submit to the knife every time. I was in Dr. [name]'s office when I got the phone call from Dr. [name]'s that "I will try this with you as long as you have the right scar.... won't induce, but I'll augment, and that is all that I will do."

A participant who had already decided to have a TOLAC was seen for a prenatal visit by a physician partner of her primary physician. This participant had researched TOLAC, was supported in her decision by her primary physician, and was given the following information from her physician's partner:

...I said I'm not scheduling a C-section I'm having a VBAC and she said "oh well you know there's a 1% risk of uterine rupture", like just boom... and of course I knew that, but like just the negative scare tactic connotation versus with a C-section I have a fairly high risk of blood loss and .... blood clots...and all that other kind of thing that goes along with major surgery. Of course she didn't mention any of that she just said, "you know there's a 1% risk of uterine rupture."

This exchange revealed the VBAC practice differences that may exist within groups of healthcare providers. Despite this interaction, the participant remained committed to the decision that she reached with her primary healthcare provider.

One participant reported a particularly negative interaction with a physician who was not her primary healthcare provider at 41 ½ weeks gestation during a routine antenatal testing session. Her regular provider, a CNM, had been supportive of her decision to await spontaneous labor and attempt a TOLAC. Despite this negative physician interaction, the participant remained committed to the decision she reached with her CNM:

[Physician] looks right at me as I'm sitting in this chair, and [physician] doesn't have a good bedside manner, and ...

[physician] goes you know babies can die in there right? And I go yah, well this one's not. [Physician]'s like we have to be prepared.... I am bawling, and I left so, so angry, and of course my husband is freaking out, my mom is freaking out.

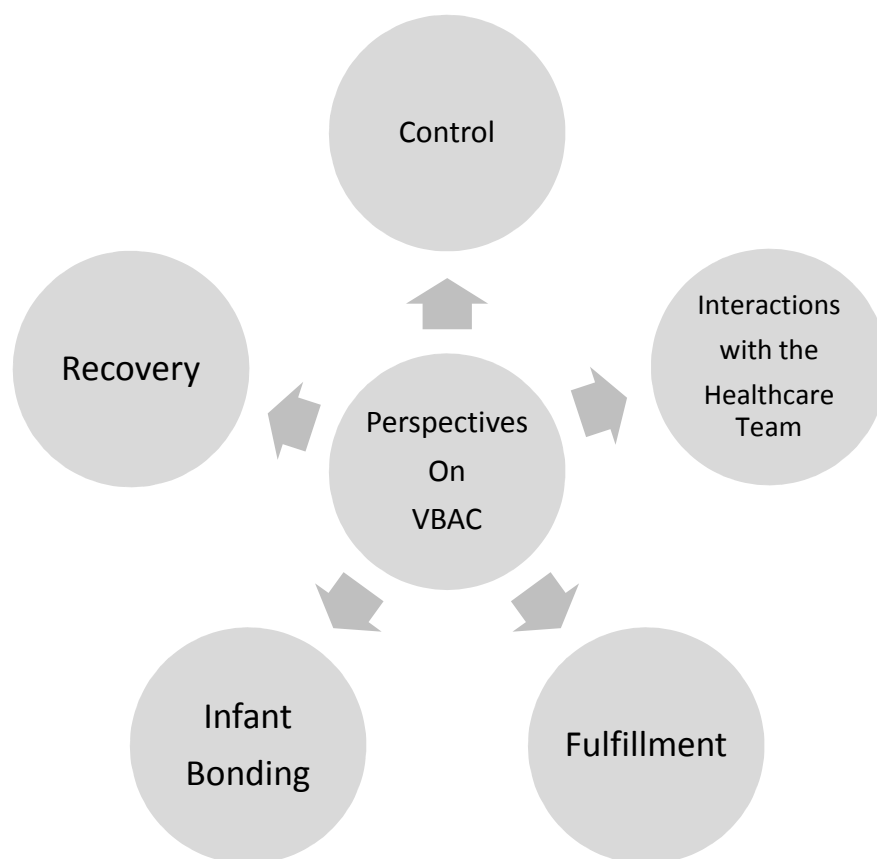
This participant proceeded to go into spontaneous labor within the next 24 hours. This physician with whom she had the negative experience was present for her VBAC. While she had this previous negative interaction with the physician, the support she received from the nurses counteracted this, and contributed to a supportive birth environment.

**Summary.** Each woman had a unique way of reaching her decision to attempt a TOLAC. For some, the decision was reached after doing their own research from a multitude of sources, and others based their decisions largely on the recommendation of their healthcare providers. Women felt supported by their partners in their decisions, and in their decisions to change their minds. Some women wanted to attempt a TOLAC even before becoming pregnant again, while two women changed their mind about a planned repeat cesarean during labor and subsequently had VBACs.

### **Theme 3: Perspectives on VBAC**

The theme of perspectives on VBAC, shown in Figure 6, encompasses the physical, emotional, and psychological aspects of the experience. Identified subthemes include control, interactions with the healthcare team, fulfillment, infant bonding, and recovery.

Figure 6

*Theme 3: Perspectives on VBAC*

**Control.** Nine participants described specific aspects of their subsequent pregnancies and TOLAC in which they exerted control within their experience. In some instances, their actions were in direct conflict with “routine” prenatal medical advice and practice. One participant identified that additional ultrasounds were sources of stress to her, so she “kinda got out of it”. Another participant who had experienced a failed TOLAC, delayed the onset of prenatal care until her fifth month of pregnancy to avoid a discussion of repeat cesarean.

Participants described taking control over their labor experiences, and acting as their own advocates. It was as if they were taking actions to prevent the previous experience(s) from reoccurring by caring for themselves during labor. One woman explained her decision to eat prior to going to the hospital, as she knew the hospital staff would not allow her to eat once she arrived. Another woman who arrived in early labor decided to leave the hospital, much to the consternation of the staff, and return when she felt symptoms of active labor. A third participant shared that she requested no resident physicians care for her, to avoid possibly encountering one who had performed her cesarean.

Women exerted control during the second stage of labor. One woman shared a desire to prove that she could deliver vaginally, and to overcome a negative perception:

So you're in this stigma that you can't do it and obviously I wanted to prove everybody wrong that I can do it....I chose to just wait with the second one instead of as soon as I felt that pressure. I didn't stay hey I need to push like I just I waited, and the second one he was down a lot farther, and I pushed for 15 minutes and he was out. It was so easy.

Another participant described control and self-advocacy after delivery. She had sustained some lacerations, and her healthcare provider recommended repairing them. The participant requested that nothing be done, and her physician respected her wishes. This positive interaction with the healthcare provider was one of many that were experienced by participants.

**Interactions with the healthcare team.** Participants described interactions with the healthcare team during their labors that were overall very positive. These interactions appeared to normalize the birth experience for several women, as described in the following quotes from two women:

When I started pushing it was so quiet in the room...nothing like you see on TV... I said “everybody’s so calm” and then they all started laughing and said “you’re the one having the baby”. Anyhow, it was just so peaceful... everyone is so quiet...they were so encouraging...

It was just two nurses, [healthcare provider], and my husband. They took off the end of the bed and [healthcare provider] just kind of perched on the end, it was just very low key. The nurses were on my side, my husband was on the other side...we were all just kind of chatting.

Women shared instances in which they felt supported by members of the healthcare team. They spoke of positive interactions with OBGYN physicians, CNMs, a nurse- midwifery student, and anesthesiologists. When women’s narratives specifically addressed nursing care, their perspectives were also positive. Participants shared that the nursing staff seemed impressed and amazed by VBAC, even though they worked in a hospital with a high volume of births. One nurse brought a “very calming presence which was good” into the VBAC experience. One participant, having delivered in the same facility less than two years earlier, spoke of the nurses as “old friends”. Another participant shared “You could tell they were all rooting for me to have this baby vaginally...they all knew that I wanted to have the vaginal birth.” Women’s perspectives of their interactions with members of the healthcare team resulted in feelings of being supported, valued, and validated in their decision to VBAC.

In a previous section regarding the role of the healthcare provider in the decision making process, a negative experience of a participant with a physician was discussed. The participant reported a discussion regarding the length of gestation and increased risk of fetal death. She stated that this discussion frightened her. This physician was on call when this participant went into labor. The prior interaction negatively impacted the participant’s perception of the physician and contribution to her care. However, she spoke

highly of the nurses that cared for her, and wistfully of what it might have been like had her primary provider been present.

The nurses were pretty cool...In fact, it was the same one that checked me when I first came in. She was like, “You came back. I was hoping to have you.” That was pretty cool. [Physician] just wasn’t like present....It wasn’t like [physician] wasn’t supportive, [physician] wasn’t not encouraging. [Physician] was just like non-there....I did it, and like “couldn’t you celebrate a little bit more like [primary healthcare provider] would have been celebrating!”

The interactions with the healthcare team were for the most part, very positive. Nurses were influential in creating a safe, calm environment for the participants. This contributed to the women’s perception of fulfillment.

**Fulfillment.** When discussing their VBAC experience, every participant was animated and positive. There was much laughter, and five women were moved to tears. Descriptions of VBAC included the words “euphoria”, “exhilarating”, “spectacular”, “awesome”, “incredible”, “amazing”, “poetic”, and “powerful”. The following excerpts are from the narratives of three women:

[As one said,] I felt kind of powerful...I’d gone through labor...and I pushed it out....my husband always says, I love him for this, “you’re just such a strong woman and to see you go through that and to push her out was amazing”.

[The second stated,] I mean it was the crowning achievement of my life. Of my life. Oh boy, really, it was the most beautiful experience of my entire life and I did it drug free.... You know, it was really profound, it was moving. I mean it was a profound change in my life. It gave me such self acceptance....And I just felt like I am so contributing to womankind.

[And the third,]...and I had in my head the things that I wanted, my bucket list, climb a mountain, run a marathon, birth a baby. And when I had the C-section I was really pissed, I’m like you just took away and now I’m like almost

[age]. I'm not going to have a chance to birth a baby.... I've already ran a marathon, I birthed a baby, and I've got Mount Kilimanjaro ready to go in my mind...I was basically euphoric afterwards and you know just it couldn't have been better...I mean I like wanted to shout from the rooftop. I got my VBAC! and it was awesome!....

The experience of VBAC was one of fulfillment for the participants. This fulfilling experience continued with prolonged periods of contact with their infants.

**Infant bonding.** Participants described positive, prolonged periods of bonding with their newborns following their VBACs. They spoke of their babies not being taken from them, and of this being very different from their cesarean experiences. One woman shared, “ They never took [baby] from me....So that was really, really nice...big surprise to the two of us because... it wasn't like that before at all”. One participant who experienced memory loss after meeting her child after her cesarean reported remembering every part of her subsequent VBAC. This prolonged period of infant bonding post VBAC resulted in two participants describing ease of breastfeeding initiation. One participant was very open with her perspectives on bonding differently with her two children. Another verbalized her belief that her children are different because of the ways in which they were delivered. Although participants contemplated differential effects based on type of delivery, they remained unsure of expressing a causation connection. The positive experiences of VBAC and infant bonding were followed by a recovery period that differed from their cesarean recovery.

**Recovery.** Participants described a range of physical levels of energy in the early hours of their recovery. Some were tired, some were physically exhilarated to the point of being unable to sleep, and two described feeling both tired and exhilarated. All participants reported easier long term postpartum recoveries, though one participant



stated that her VBAC recovery length was “not a lot quicker” in duration, due to an extensive vaginal/perineal laceration and repair. All women verbalized being able to move much easier after a VBAC, which positively impacted being able to care for themselves and their children. One participant shared “I felt like superwoman, like my body did it and I’m healing and everything, it was easy, everything was just easier the second time around with the VBAC”.

**Summary.** Within the theme of perspectives on VBAC, all participants exerted control through their conscious choice to attempt a TOLAC. Many shared specific examples of self-advocacy and self-care during the decision making process, as well as during labor, delivery, and recovery. As discussed in the prior section, the relationship with the primary health care provider was pivotal not only in making the TOLAC decision, but in remaining resolute when faced with intimidating challenges to this decision.

Participants, with one exception, spoke highly of the health care team with whom they interacted. They felt supported and encouraged by the nurse-midwives, nurses, and physicians who cared for them. Nurses were consistently identified as positive for their support, and at times being able to counteract a negative physician interaction.

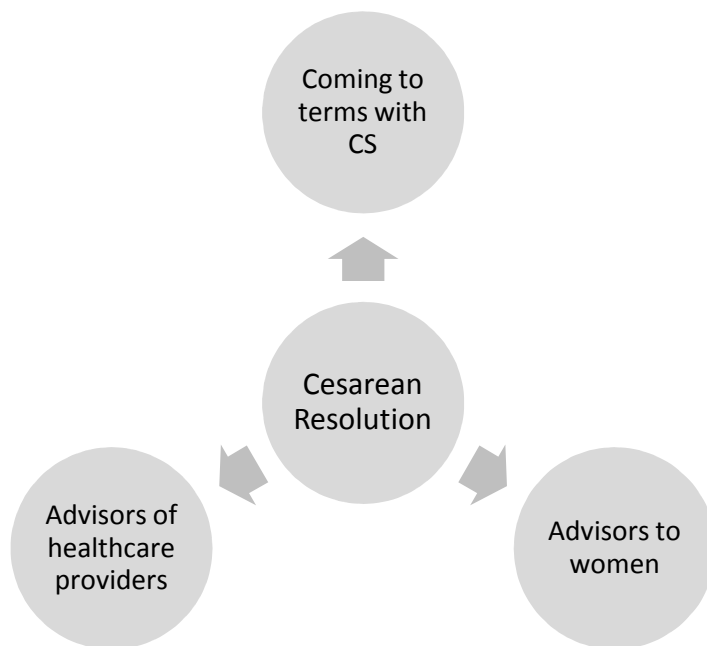
All women described their VBACs as positive experiences, and two pregnant participants were planning to have another. The experience of VBAC was described as powerful, life changing, and altered how women perceived themselves. They reported VBACs resulted in increased opportunities for infant bonding, improved initiation of breastfeeding, and earlier resumption of activity due to less pain and no need for major abdominal surgical recovery.

#### Theme 4: Cesarean resolution

Participants shared a process of cesarean resolution, shown in Figure 7, which was an individual process of coming to terms with their cesarean births. Subthemes included coming to terms with cesarean, advisors to women, and advisors of healthcare providers. Women shared their experiences, and the knowledge they had gained, acting as advisors to women and to healthcare providers.

Figure 7

*Theme 4: Cesarean Resolution*



**Coming to terms with cesarean.** Four women spoke of understanding the necessity of their cesarean deliveries, of acceptance of their experiences, and of the value of the VBACs. One participant stated, “for her safety and for mine... that was best decision (cesarean)...For safety purposes, I’m glad I did it... At that point in time, I didn’t see a different option.” After a difficult cesarean experience, the VBAC resulted in

one participant being able to “push that memory (cesarean) aside, and I have the memory of this really, really positive experience and all these wonderful people that took care of me”. This experience, and others similar to it, resulted in women wanting to encourage others to have VBAC.

**Advisors to women.** Every participant verbalized that they were glad they chose to have VBACs , and two pregnant participants intended to repeat their decisions. Participants shared their gained knowledge, and had much advice and encouragement to share with other women. One woman stated, “I think a lot of women need to understand that there is the alternative out there...people are doing it basically every day...”. Another participant advised, “If your doctor says it is healthy and you know that you’re are good candidate for it...you should go for it ‘cause it really is a wonderful experience...”. When thinking about uterine rupture risk, another participant stated:

The uterine rupture risk makes people so scared, and when you look at the actual statistics in terms of a .08% chance of uterine rupture, and the chances of that actually being catastrophic were even lower. I just think that sometimes that’s used as a scare tactic.

Advice they shared was not solely about choosing VBAC, but also included wisdom about pregnancy, labor, books to read, the need to do research, and inner strength. While all participants were pleased with their VBAC experience, as one participant advised:

... go with what you feel is best for you. Go with what you take into consideration, what other people’s stories may be, but your own story is what matters. Whatever you feel best and comfortable for yourself is what you need to do, and create that story for yourself.

Women also had advice to share with healthcare providers. Specific recommendations for patient education were shared.

**Advisors of healthcare providers.** Participants also shared knowledge they had gained and recommendations with healthcare providers. For two women, their desire to teach healthcare providers about VBAC was so strong that they felt compelled to invite students, residents, and other providers to participate in their labors and births in an effort to make them comfortable with the idea. Women also had suggestions for healthcare providers who counsel women about VBAC. One participant recommended that healthcare providers should be “encouraging and supportive and give as much information as possible”. Another woman recommended that cesarean should not be “such as easy option for people because it is a serious surgery and I don’t really feel like I was quite prepared for the risks and the recovery afterward...”

**Summary.** Within the theme of cesarean resolution, women spoke of coming to a sense of acceptance about their cesarean. They also gave advice that may prove valuable to other potential VBAC/TOLAC candidates, including the importance of making one’s own decisions, and suggesting resources. Participants also had concrete recommendations for healthcare providers on how to encourage and support women in their decision making.

## **Chapter Summary**

In this chapter, the results of the research were presented. The 4 major themes of perspectives on cesarean, informed decision making, perspectives on VBAC, and cesarean resolution were reviewed. Each major theme had multiple subthemes that were illustrated with representative quotes from participants. In the upcoming chapter, the

comparative experiences of cesarean and VBAC will be explored in relationship to currently existing research.

## Chapter 5 Discussion

In this chapter, the research questions are answered, and comparative experiences of cesarean and VBAC are explored. The themes of perspectives on cesarean, informed decision making, perspectives of VBAC, and cesarean resolution, as well as their related 21 subthemes, are integrated throughout the answers to research questions and in the subsequent discussion. Results are examined for their theoretical and practical implications, importance, clinical significance, and congruence with existing research. Finally, the strengths and weaknesses of the study will be explored, and areas of recommended future inquiry are outlined.

### Research Question #1

#### How will women describe the experience of VBAC?

Participants' descriptions of VBAC were universally positive. The psychological and emotional experience was described as healing, euphoric, life altering, and fulfilling. The participants described the profound impact VBAC had on their self-perception and confidence as women and mothers, and how it positively impacted maternal-infant bonding and breastfeeding. These findings were consistent with those of two other qualitative studies of VBAC experiences where women described VBAC as a "significant life event" (Fenwick et al., 2007, p.1565) and "as a significant aspect of their femininity" (Phillips et al., 2010, p.882). In this study, participants were overwhelmingly positive about their VBAC experiences.

Women shared their VBAC experience as a journey that began with their decision to seek it out as an option. For some, this began prior to becoming pregnant with the child

they would eventually deliver by VBAC. For others, the decision was made during labor. In the course of the VBAC journey, women described exerting control. All participants demonstrated control over the decision making process. This exertion of control extended into prenatal care and labor and delivery experiences, as they worked through barriers towards VBAC, and acted as self-advocates. This is similar to the findings of VandeVusse (1999a) in which women's birth stories were studied for meanings of control and decision making. It was found that the more participants were able to share in the decision making, the more positive were their emotional responses to their birth experience.

Overall, participants in this study felt supported during their journey to VBAC, beginning with informed decision-making. This support came from both primary healthcare providers and family members who either provided information that was critical in their decision-making, and/or supported their decision to VBAC. In a telephone interview survey, women who experienced successful VBAC identified the input from family and friends as being influential in their decision making (Fenwick et al., 2007). However, the support that participants in this study received from their healthcare providers during decision making stood in stark contrast with the experiences of women in two other studies. Women in these other studies perceived that their decisions were met with resistance from their healthcare providers (Fenwick et al., 2007; McGrath et al., 2010). The differences in the experiences between the studies may be due to a current shift in practice that is resulting from questioning the safety of repeat cesareans and some of the associated morbidities.

An important finding within participants' stories of success was their personal resolve to have a VBAC. When faced with challenging or threatening information from others, the information and support participants received from their primary healthcare providers served as reinforcement. Additionally, during labor, the caring support they received from healthcare providers, especially nurses, resulted in calm, positive birth environments which normalized the experience for them. The influential role of nurses' caring behaviors on a positive birth experience was similar to that found by previous researchers (Hanson, VandeVusse, Harrod, 2001; Harrod, 1998; MacKinnon, McIntyre, & Quance, 2005; VandeVusse, 1999a; VandeVusse, 1999b).

Participants described the physical experience of VBAC choosing powerful words including intense, exhilarating, hardcore, and peaceful. In some cases, it was likened to an athletic event, a desired physical challenge that was overcome. In all stories, women shared that they were happy with their decision to have VBACs, and for two pregnant participants, they both intended to VBAC once again. In a recent metasynthesis of qualitative VBAC studies, while VBAC was described as empowering, there were no descriptions of the powerful physical VBAC experience (Lundgren et al., 2012).

### **Summary of Question #1**

As described in the third theme in Chapter 4, the experience of VBAC was overwhelmingly and consistently positive. Women were supported in their decision to VBAC by significant others and their healthcare providers. VBAC was described as being psychologically, emotionally, and/or physically beneficial by participants. The impact of VBAC was not limited to the time of the delivery and postpartum recovery, but



was a healing experience that brought increased confidence, self acceptance, and profound change to lives of women.

### **Research Question #2**

#### **How will women compare their experiences of CS with VBAC in their birth stories?**

Cesarean was universally described by participants as unwanted and/or unexpected. The cesarean was often described as frightening, traumatizing, disappointing, and culminating in feelings of failure. Women remembered feelings of frustration, detachment, and a sense of not being heard by healthcare providers. Participants grieved for the vaginal birth experience that had been desired and anticipated. These descriptions are consistent with findings of other studies outlining women's perceptions of cesarean section as described in Chapter 2 (Fenwick et al., 2003; Fenwick et al., 2007; Phillips et al., 2010; Ryding et al., 1998). For those that breastfed, the cesarean recovery made it more difficult. Postoperative memory loss further compounded the negative emotional and psychological experience for several participants. This phenomena has been previously described as possibly being an indicator for trauma experienced during childbirth (Kennedy & MacDonald, 2002; Ryding et al., 1998).

The cesarean recovery period was consistently described as a negative experience involving significant pain. Women reported decreased mobility, fatigue, and a reliance on others for physical assistance in caring for themselves and their infants. These findings were consistent with two prior studies where women discussed their cesarean and VBAC recovery experiences (Meddings et al., 2007; Fenwick et al., 2007). The issues of cesarean recovery also had a negative effect on breastfeeding. These findings were

congruent with those of a study by Zanardo et al. (2010) where cesarean birth was associated with delayed initiation and lower rates of exclusive breastfeeding. Three participants of this study described postoperative pain that lasted 8 months to several years after their cesarean. This finding was similar to those of Loos et al. (2008) in which two years after a Pfannensteil incision for cesarean or hysterectomy, one-third of their participants reported experiencing chronic pain.

In comparison, VBAC was chosen and desired by all participants. While the informed decision making process was unique for each woman, central to all informed decision making was the role of a trusted healthcare provider, and a valued conversation regarding the risks and benefits of VBAC. The role of a supportive healthcare provider in the decision making was similar to that described by Ridley et al. (2002). In their small study sample of five women, physician support was found to be an influential factor in the decision to VBAC. In this study, the informed decision making process empowered women to make choices that were best for them, not necessarily reflecting those most convenient for their healthcare provider. These findings were in stark contrast to those of McGrath et al. (2010), in which the healthcare providers were viewed by the women as pro-Cesarean, and over-emphasizing the risks of VBAC. Similarly, Goodall et al. (2009) found that prospective VBAC clients did not have enough knowledge to make an informed decision, were limited by statistical probability based information, received indirect and sometimes leading communication, and ultimately relinquished control to the health professionals involved in their care. However, women in this study experienced highly participative informed decision-making, including ongoing support that

contributed to their successful VBACs. This may reflect changes in practice patterns in the past few years.

As was discussed in the section regarding research question #1, the physical process of VBAC, including the recovery period, was described as overwhelmingly positive. Conspicuously absent from the women's narratives were descriptions of debilitating labor pain. None of the women, including the four women who labored without epidural, described an inability to cope with the pain of labor. These participants, to avoid the certain pain of a RCS and recovery, chose to experience the pain of labor. The VBAC experience was associated with decreased levels of postpartum pain, earlier resumption of normal activity, and the reports of women's abilities to care for themselves and their children more readily. Participants therefore described levels of independence and self-sufficiency that were in sharp contrast to their stories of cesarean recovery.

The emotional and psychological benefits of VBAC extended beyond the time of birth. For several participants, VBAC was perceived as a life goal that was met, and a challenge that was conquered. Several women spoke of this being a profound experience in their lives that resulted in self-acceptance and happiness. The ability to care for themselves and their families resulted in descriptions of empowerment and pride. The opportunity to experience prolonged periods of bonding and easier initiation of breastfeeding was highly valued by the participants and their families. A recent meta-synthesis of 8 studies of differing aspects of women's experiences described VBAC as an empowering "meaningful experience of importance for them as women" (Lundgren et al., 2012, p.7), which concur with the findings of this study. For those women who had experienced memory loss with cesarean, the VBAC was associated with mental clarity.

## Summary of Question #2

Study participants described their cesarean as being unexpected/unwanted, frightening, disappointing, and often accompanied by feelings of failure and memory loss. The cesarean and recovery period were accompanied by unexpected levels of intense pain, in some cases chronic, difficulty with breastfeeding, decreased mobility, and dependence on others.

In stark comparison, the VBAC was chosen and desired. The experience was emotionally fulfilling, and in some instances, described as life altering. Women felt supported and empowered in their decision making. The VBAC recovery was described as much easier and shorter in duration. Women reported that they were self-sufficient and independent in caring for themselves and their children, which resulted in increased levels of self confidence.

## Theoretical and Practical Implications

**Vulnerability.** Based on gender alone, women are a vulnerable population. Pregnancy adds another layer of perceived or real vulnerability. Pregnant women who have experienced a prior cesarean may be vulnerable to manipulation by fear during the VBAC decision-making process. If the healthcare provider over-emphasizes risk, or withholds information necessary for truly informed consent, then a woman is manipulated into making a decision that serves the interest of the healthcare provider.

**Feminism.** The principles of feminism outlined in Chapter 2 guided this research. Women and their interests were central to every aspect of this study. The processes of listening to women share their experiences, while considering the deeper meanings of

their stories during analysis, was a major strength of this study. The gap that was identified in the evidence concerning women's comparative experience of VBAC and cesarean (Cunningham et al., 2010a) is a feminist issue. It is another example of women's interests being excluded from medical research, and to date this topic has remained largely unexplored. Only women who have experienced both caesarean and VBAC can provide this valuable insight. This study serves to begin to fill the gap in needed comparative research.

Feminist research seeks to create social change (Stevens, 1991). This study sought to inform a change in the balance of power surrounding the VBAC experience by informing women about emotional, psychological, and physical benefits of VBAC as told by the participants. A pivotal first step in women taking control of their VBAC experience is their conscious informed decision to choose it. Specifically, if women have more appropriately informed participation in the decision-making process, the VBAC option might be more frequently chosen versus repeat caesarean. As discussed previously, the women in this study were informed of the risks and benefits of VBACs, and their decisions were encouraged and supported by their primary healthcare provider.

This study sought social change through informing healthcare providers about the largely unexplored benefits of VBAC from the perspective of those who experience it. It will inform healthcare providers about the meaningfulness of the VBAC experience in the lives of women. The words of participants in this study will also serve to remind healthcare providers of the trust that women have in them at vulnerable times in their lives. It is hoped that this study will also serve to contribute to research that results in increasing positive perceptions of VBAC.

As outlined in Chapter 2 (p.33), the Wittman-Price Theory of Emancipated Decision Making in Women's Healthcare (WPTEDMIWH) identifies specific attributes that must be present in order for a woman to make a truly free choice. These attributes include reflection, personal knowledge, empowerment, awareness of social norms, and a flexible environment.

Reflection is the process in which women consider their alternatives in healthcare. In this study, there was a process during which they considered the options of RCS or VBAC, and it varied between individuals.

Personal knowledge is a woman's awareness of the alternatives in relationship to herself. Each considered the alternatives within the context of her life, and how each outcome would impact it.

Empowerment is reflected in this theory as being the information and resources that women are given by their healthcare providers, or their reactions to information that they found on their own. Women in this study were empowered in their decision making, and through the support they received for their decisions.

Awareness of social norms is defined as being aware that society places more value on one or more of the alternatives being provided. When women are emancipated in their decision making, they are able to make a decision that serves their interests, even if it is not socially popular.

A flexible environment is one that is conducive to change, and is one that allows women to make an unopposed enactment of a chosen decision. This was demonstrated in this study by the facilities and staff being supportive of VBAC. Flexibility was also

demonstrated by women changing their mind about VBAC, and being supported in their decisions.

Aspects of emancipated decision-making were described by most of the participants in the study. Ultimately, emancipated decision making was associated with their VBAC success.

### **Practical Implications: Listening to Women as Lessons for Healthcare Providers**

Throughout the narratives, women had knowledge that they wished to share with healthcare providers. In this section the impact of cesarean and the informed consent process are described.

**Impact of Cesarean.** The narratives revealed dramatic stories of the unexpected nature of the cesarean. Even when the cesarean was planned, it was described as unwanted. As these women reported, cesarean is not only accompanied by physical pain and a prolonged recovery, but is often accompanied by significant, ongoing emotional and psychological pain. This psychological and emotional pain often occurred without being addressed or acknowledged by their healthcare providers.

One participant shared that while her cesarean was unexpected and unwanted, she did recall positive aspects of it, as she felt connected to the surgical process through the communication and actions of the surgeon. The surgeon had an ongoing conversation with her, describing the progress, and alerting her to what she might be feeling. This participant was able to see her baby immediately after the delivery, held her baby as soon as possible, and had prolonged periods of contact in the OR and recovery room. While her cesarean was unexpected and unwanted, she did identify positive aspects about the surgery.

If a cesarean is necessary, there should be active and ongoing communication with the woman throughout the surgery whenever possible. This could result in inclusion in the experience, and decrease the possibility of maternal feelings of detachment. Whenever possible, maternal-infant bonding and breastfeeding should be encouraged and supported within the environment of the OR and the recovery room.

Communication during the immediate postpartum period ideally would be supportive and affirming, with acknowledgement of the struggle to incorporate the cesarean experience into each woman's reality. Many participants described being ill prepared for the profound pain, fatigue, and physical dependence on others during their cesarean recovery. Women need to be given frank anticipatory guidance regarding postpartum and postoperative care, so they do not perceive their fatigue and pain as personal shortcomings. Although the participants described tremendous support from family and/or significant others, this may not be the case for all women who experienced cesareans. Women and their families need high quality information about the full scope of various impacts of the cesarean birth experiences. Finally, early and ongoing dialogue about VBAC for future births may be considered helpful by women as they consider their options for subsequent pregnancies.

**Informed consent.** The participants in this study described a process in which they reflected upon the option of VBAC versus RCS, the risks and benefits of each, and how these outcomes would influence their lives. Participants described a process of emancipated decision-making in which they were active participants. Some participants came to the conversation empowered with knowledge and information to discuss with their healthcare providers. Others received information from their healthcare providers



that served as a basis for informed decision-making. Despite perceived social norms and recent practice patterns that might have seemed to favor RCS, participants chose to VBAC, understanding the risks and benefits of VBAC/RCS. All participants received support for their VBAC decisions from their healthcare providers. With one exception, throughout the antepartum experiences, women described continued support for their VBAC decision. Supportive intrapartum care from nurses and providers served to reinforce their VBAC decisions.

The participants gave birth in flexible healthcare environments that supported them and their decisions. The option to change their decision was available. In fact, two women who had planned RCS changed their minds during labor, and had successful VBACs. In both of these cases, the healthcare providers offered them VBAC as an option and supported their new decision, even though it may be less convenient for the provider. For example, a repeat cesarean can typically be performed within one to two hours, including patient preparation for the operating room, anesthesia, surgery, and moving to a postoperative recovery area. In comparison, VBAC may take significantly longer. In addition, despite the latest guidelines outlining that surgeons do not need to be immediately available during a TOLAC, most facilities still require that there is a surgeon present who is capable of performing an emergent cesarean if a woman is experiencing labor after a prior cesarean. If the hospital did not have an in-house surgeon or obstetrician available at all times, this would result in one being called in to be present.

Informed consent relies on evidence-based unbiased information where the best interests of the woman are held as central. In this study, women's successes with their VBAC experiences were based on well-informed, unopposed decision-making processes.

## **Clinical Significance**

The participants' descriptions of the profound physical and emotional experience of both cesarean and VBAC can inform healthcare providers to better serve childbearing women. This insight offers healthcare providers opportunities to reassess current practices, and the effects that they have on women's birth experiences. The impact of birth experiences on the lives of women cannot be underestimated. It can shape how she sees herself, how she interacts with her child, and can have a long term positive or negative impact on her views of the experience, as identified by prior research (Simkin, 1991). As described by one woman in this study, her cesarean experience was positive because she was an active participant in the birth process. The surgeon used words and actions to guide the woman through the cesarean, similar to a midwife guiding a woman through a vaginal birth. Healthcare providers can make each birth experience, regardless of mode of delivery, positive and affirming for women and their families.

## **Implications for Nursing Practice**

In this study, several participants described feelings of being unsupported and not heard during labor, which they identified as contributing either to their need for cesarean, or to a negative cesarean experience. Labor support is an evidence-based intervention that has been shown to reduce the need for cesarean (Hodnett, Gates, Hofmeyr, & Sakala, 2013). Similarly, women were unprepared for the pain and length of the post-operative recovery. Anticipatory guidance regarding pain management and expectations for recovery could benefit women following this unexpected major surgery. Almost all of the women described the cesarean experience as profoundly negative. Effective therapeutic

communication is recommended to decrease the likelihood of negative emotional outcomes. Some participants recalled prolonged, emotionally painful separation from their infants following cesarean. Nursing care that promotes maternal-infant bonding and breastfeeding is essential, beginning in the operating room and extending throughout the hospital stay.

Intrapartum nursing care that keeps the woman as central is both safe and satisfying. The participants described a high level of caring, a sense of camaraderie, with their nurses during the labor that led to their successful VBACs. In this study, the participants described that their nurses advocated for them, in some cases protected the immediate environment, and created safe spaces for their VBACs. Even though a VBAC holds some inherent risk and requires additional nursing surveillance, the women did not report perceiving an increased level of stress, as their nurses remained calm and supportive. Women perceived that their nurses were in agreement with their decisions to VBAC. This kept them feeling supported and validated throughout their birth experiences.

### **Implications for Nurse-Midwifery Practice**

Although the findings were not analyzed by birth attendant type, three of the participants were clients of Certified Nurse Midwives (CNMs), either for prenatal care, intrapartum care, or both. The participants described their CNMs as being supportive of their decisions to VBAC, and were a valuable resource during the decision-making process. CNMs have had a long standing philosophic tradition of advocating for and supporting woman-centered, evidence-based care that includes VBAC.

### **Implications for Nursing Education**

Nurses at all levels of education and experience need to be aware of VBAC, especially as it pertains to risks, benefits, and patient safety. Evidence-based nursing care requires a balanced understanding of the actual risks of VBAC in relation to those of RCS. Nurse educators can teach sound decision making strategies, as they form a solid foundation for evidence based intrapartum care that can promote successful VBAC. Nurses need to appreciate the value of keeping women central in the decision making process, as it positively impacts patient safety and satisfaction. For nurses regardless of level of experience, this study demonstrated the valued role that nurses had in advocating for the participants, and in the importance of nurse-patient relationships during the childbirth experience.

### **Implications for Nursing Research**

This study begins to fill an identified gap in the evidence of the comparative experience of cesarean and VBAC from the woman's perspective, and may serve as a resource to others investigating similar topics in the future. This study may serve as a resource for other nurse researchers investigating issues central to women's interests and healthcare. As qualitative evidence becomes widespread and available to inform this study may also serve as a resource to other qualitative researchers.

### **Strengths and Limitations**

**Strengths.** As discussed previously, the National Institutes of Health (NIH) has identified the area of "comparative long-term maternal and perinatal biological and

psychological outcomes following VBAC” as a critical gap in the evidence (Cunningham et al., 2010a). This study directly addresses this issue.

Using feminism as the guiding philosophy was a major strength. This study sought not only to inform others about the subject, but to value women and validate their experiences throughout the research process.

The researcher is an experienced CNM clinician, with over two decades of experience within labor and delivery. As a result, the researcher understands not only the clinical risks and benefits of VBAC/RCS, but is aware of the barriers that women may need to overcome in choosing VBAC.

Participants in this study had experienced VBAC in the last 5 years, which was a deliberate research decision to reflect contemporary VBAC practice. Bracketing was intentionally done to limit researcher biases. Rigor was maintained through establishing rapport prior to and during interviews, audio-taping interviews, construction of field notes, careful transcription, reviewing each transcribed interview multiple times for accuracy, the use of an audit trail, and data reduction notes. Initial coding was verified by the dissertation chair and one committee member. Final coding was simplified and verified by the chair of the committee and the researcher.

**Limitations.** This was a qualitative study, the sample size was small, and therefore not representative of all women who have had successful VBACs. Due to the fact that all participants were all from the same geographic area, regional practice influences may have impacted the study findings. Although there were 3 African American women and 10 Caucasian women in the study, the sample lacked Latina participants, which would have contributed to a more accurate reflection of the diversity

in the geographic area. Women who chose to participate in this study may have had more positive experiences than those that chose not to participate. Physicians and CNMs who displayed flyers in their offices and spoke to patients about the study may have been more supportive of VBAC as an option, compared to providers in the general population. VBAC was supported in all hospitals in which women gave birth, though this may reflect a regional influence on health care. While the researcher is an experienced CNM clinician, she was new to qualitative methods.

### **Recommendations for future research**

Women's experiences of VBAC deserve more attention and further research. In some areas, women need to actively search for a provider or hospital setting that offers a VBAC option. The experiences of women who must overcome these barriers to experience VBAC are absent from the scientific literature. Studies of attributes of healthcare providers and settings that support women's choice to VBAC are needed to contribute to ever-expanding options for women and their families. A qualitative study of the provider motivations to provide VBAC services is also needed.

Additional inquiry is needed in women's experiences of cesarean birth. For example, more study of the aspects of the cesarean experience that are valued and useful is needed. Ultimately, an intervention study could test approaches that foster a more meaningful, fulfilling, and interactive cesarean birth experience.

Research regarding the experience of failed VBAC, or unsuccessful TOLAC is also needed. Information gained may help improve care to women having VBACs or cesareans. Additionally, studies of various approaches to informed consent are needed, especially those that follow the woman through her choice to the mode of birth, whether

her choice is VBAC or a RCS. This could elucidate how providers present information that supports a woman in an emancipated decision making process.

### **Summary**

In this study, women consistently reported VBAC as a positive physical, emotional, and/or psychological experience in their lives. Participants reported feeling supported and empowered in their decision to VBAC, as well as during the time of their labor and birth. This stood in stark contrast to the majority of cesarean experiences in which women reported negative physical, emotional, and/or psychological experiences. One participant shared a story of her cesarean in which she was guided through it by the surgeon, and was made to feel included in the experience. The words of women shaped recommendations for understanding the impact of cesarean and the process of informed consent. The fact that the comparative experience of cesarean and VBAC has not been extensively explored is a feminist issue, as this is yet another area of research in which women's preferences have been overlooked. By listening and learning from women, healthcare providers can become enlightened about the significance of birth, whether cesarean or vaginal, in the lives of women. This can serve as a catalyst for changing attitudes towards birth, making care more woman-centered, and ultimately, empowering women to have positive birth experiences.

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## Appendix A

Elizabeth Hill-Karbowski, PhD(c), CNM  
12415 W. Forest Drive  
New Berlin, WI 53151

Name of Health Care Provider  
Address of Office  
City, State Zip Code

January 28, 2013

Dear Health Care Provider,

I am a Nurse-Midwife, and a doctoral student at Marquette University College of Nursing. My doctoral dissertation pertains to women's comparative experience of vaginal birth after cesarean (VBAC) and cesarean section. I am seeking participants who are willing to speak to me about their birth experiences during a single in person interview. The interview will be held at the participant's convenience, at a time and place of their choosing.

I would greatly appreciate your assistance in identifying potential participants, specifically women who have experienced a successful VBAC of a healthy child. Enclosed is a flyer regarding the study, and my contact information. I would appreciate it if you would post this information in your office waiting room and exam rooms.

In addition, the participant's confidentiality will be ensured, and their consent will be obtained prior to the interview. Please note that this research study has received IRB approval from Marquette University

Thank you for your consideration.

Regards,

Elizabeth Hill-Karbowski, PhD(c), CNM



## Appendix B

## Did you have a vaginal birth after cesarean (VBAC) in the last 5 years?

Would you like to share your knowledge of the experience?

I am a Certified Nurse-Midwife and doctoral student at Marquette University studying vaginal birth after cesarean (VBAC). The study involves a single interview at a time and place of your choosing.

I would appreciate the opportunity to speak with you about the study, and to answer any questions that you might have about possible participation.

Elizabeth Hill-Karbowski  
414-840-4845



## Appendix C

MARQUETTE UNIVERSITY  
 AGREEMENT OF CONSENT FOR RESEARCH PARTICIPANTS

A Feminist Perspective on Listening to Women: Birth Stories of Vaginal Birth  
 Following Previous Delivery

Elizabeth Hill-Karbowski  
 Marquette University-College of Nursing

You have been invited to participate in this research study. Before you agree to participate, it is important that you read and understand the following information. Participation is completely voluntary. Please ask questions about anything you do not understand before deciding whether or not to participate.

**PURPOSE:** The purpose of this research study is to gain insight into the experience of vaginal birth after cesarean (VBAC) from the woman's perspective, and to contribute knowledge in a needed area of study.

**PROCEDURES:** We will meet for an in-person interview, at a time and place of your choosing. A form will be filled out. This form includes personal information such as your name, age, race, education level, the years of your deliveries, and type of OB health care provider. All of this personal information will be kept confidential in a locked safe. You will be audiotaped during the interview portion to ensure accuracy. The audiotape will be transcribed. Your personal information will not be audiotaped, and will be kept separate from your transcription. The data, transcripts, and research records will be kept indefinitely. However, all of your personal information will be destroyed within two years.

**DURATION:** Your participation will consist of one session. It will take as long as you wish. On average, this would be about 1-2 hours.

**RISKS:** The risks associated with participation in this study are no more than what you would experience in everyday life when you share your birth stories with others. Sharing stories with others may result in recalling memories that may be disturbing to you. If this occurs, please let me know immediately. If during the course of this study, I become privy to information that triggers mandatory reporting requirements for child abuse, child neglect, elder abuse, or intent to harm yourself or others, I must follow through with reporting it.

**BENEFITS:** The benefits associated with participation in this study include those associated with sharing birth stories. Sharing your birth stories can help you find new meaning of the experiences, and to see them in a different way. The process of sharing these meaningful experiences can be helpful to those of us who work in healthcare, as we

become aware of the process from the patient's perspective. Your contribution can make a difference in the healthcare of others.

**CONFIDENTIALITY:** All information you reveal in this study will be kept confidential. All your data will be assigned an arbitrary code number rather than using your name or other information that could identify you as an individual. When the results of the study are published, you will not be identified by name. The data, research records, and transcripts will be kept indefinitely. However, all of your identifying information will be destroyed within two years. Your research records may be inspected by the Marquette University Institutional Review Board or its designees, and (as allowable by law) state and federal agencies.

**EXTRA COSTS TO PARTICIPATE:** The cost to you would be the cost of transportation to the site of the interview.

**INJURY OR ILLNESS:** Marquette University will not provide medical treatment or financial compensation if you are injured or become ill as a result of participating in this research project. This does not waive any of your legal rights nor release any claim you might have based on negligence.

**VOLUNTARY NATURE OF PARTICIPATION:** Participating in this study is completely voluntary and you may withdraw from the study and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled.

**CONTACT INFORMATION:** If you have any questions about this research project, you can contact Elizabeth Hill-Karbowski at 414-840-4845. If you have any questions or concerns about your rights as a research participant, you can contact Marquette University's Office of Research Compliance at (414) 288-7570.

I HAVE HAD THE OPPORTUNITY TO READ THIS CONSENT FORM, ASK QUESTIONS ABOUT THE RESEARCH PROJECT AND AM PREPARED TO PARTICIPATE IN THIS PROJECT.

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Participant's Name

\_\_\_\_\_  
Researcher's Signature

\_\_\_\_\_  
Date

## Appendix D

## Demographic Information

Name\_\_\_\_\_

Age\_\_\_\_\_

Race\_\_\_\_\_

Marital status\_\_\_\_\_

Highest level of education completed\_\_\_\_\_

Year/location/method of delivery (Cesarean, vaginal, vaginal birth after cesarean,  
forceps, vacuum)

1.\_\_\_\_\_

2.\_\_\_\_\_

3.\_\_\_\_\_

4.\_\_\_\_\_

5.\_\_\_\_\_

6.\_\_\_\_\_

7.\_\_\_\_\_

Type of OB health care provider (OBGYN physician, FP physician, Certified Nurse

Midwife\_\_\_\_\_

## Appendix E

### List of Possible Questions

The participant will be invited into the interview with the statement “Tell me about your cesarean and vaginal birth after cesarean experiences in any way that you wish.” Additional possible questions include:

Tell me about your initial cesarean... Why did it occur?

Tell me about your decision to attempt VBAC including how and when you decided...

Did you ever experience second thoughts about your decision to VBAC?

Tell me about how your partner/family/friends react to your decision...

Tell me about your VBAC labor experience...

Tell me about how you how you felt immediately following the VBAC...

Did your VBAC recovery in the hospital differ from your cesarean recovery? If so, how did it differ?

Did your overall recovery from the VBAC differ from your cesarean recovery?

If so, how did it differ?

## Appendix F



Office of Research Compliance

Schroeder Complex, 102  
P.O. Box 1881  
Milwaukee, Wisconsin 53201-1881P 414.288.7570  
F 414.288.6281  
W [marquette.edu/researchcompliance](http://marquette.edu/researchcompliance)

January 24, 2013

Ms. Elizabeth Hill-Karbowski  
Nursing

Dear Ms. Hill-Karbowski:

Your protocol number HR-2527, titled, "*A Feminist Perspective on Listening to Women: Birth Stories of Vaginal Birth Following Previous Delivery*" was expedited on January 17, 2013, by a member of the Marquette University Institutional Review Board.

Your IRB approved informed consent form is enclosed with this letter. Use the stamped copies of this form when recruiting research participants. Each research participant should receive a copy of the stamped consent form for their records.

Subjects who go through the consent process are considered enrolled participants and are counted toward the total number of subjects, even if they have no further participation in the study. Please keep this in mind when conducting your research. This study is currently approved for 20 subjects.

If you need to increase the number of subjects, add research personnel, or make any other changes to your protocol you must submit an IRB Protocol Amendment Form, which can be found on the Office of Research Compliance web site: <http://www.marquette.edu/researchcompliance/research/irbforms.shtml>. All changes must be reviewed and approved by the IRB before being initiated, except when necessary to eliminate apparent immediate hazards to the human subjects. Any public advertising of this project requires prior IRB approval. If there are any adverse events, please notify the Marquette University IRB immediately.

Your approval is valid until January 16, 2014. Prior to this date, you will be contacted regarding continuing IRB review.

An IRB Final Report Form must be submitted once this research project is complete. The form should be submitted in a timely fashion, and must be received no later than the protocol expiration date.

If you have any questions or concerns, please do not hesitate to contact me. Thank you for your time and cooperation.

Sincerely,

Benjamin Kennedy  
Research Compliance Officer-Human Subjects & Radiation Safety

cc: Dr. Christopher Okunseri, IRB Chair  
Dr. Lisa Hanson, Nursing  
Ms. Sherri Lex, Graduate School

Enclosure

## Appendix G



Office of Research Compliance

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P.O. Box 1881  
Milwaukee, Wisconsin 53201-1881

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F 414.288.6281  
W [marquette.edu/researchcompliance](http://marquette.edu/researchcompliance)

February 7, 2013

Ms. Elizabeth Hill-Karbowski  
Nursing

Dear Ms. Hill-Karbowski:

The amendment you submitted on February 4, 2013, for your protocol number HR-2527, titled, "*A Feminist Perspective on Listening to Women: Birth Stories of Vaginal Birth Following Previous Delivery*," received expedited approval on February 6, 2013, from a member of the Marquette University Institutional Review Board.

This amendment revises the recruitment letter and recruitment flyer.

Your protocol is valid until January 16, 2014. Prior to this date, you will be contacted regarding continuing IRB review. Any public advertising of this project requires prior IRB approval. If there are any changes in your protocol or adverse events, please notify the IRB immediately.

If you have any questions or concerns, please do not hesitate to contact me. Thank you for your time and cooperation.

Sincerely,

Amanda J. Ahrndt, RN, MS, MSN, CIM, CIP  
IRB Manager

cc: Dr. Christopher Okunseri, IRB Chair  
Dr. Lisa Hanson, Nursing

Enclosure

AA/r



## Appendix H



Office of Research Compliance

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P.O. Box 1881  
Milwaukee, Wisconsin 53201-1881

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F 414.288.6281  
W [marquette.edu/researchcompliance](http://marquette.edu/researchcompliance)

April 17, 2013

Elizabeth Hill-Karbowski  
Nursing

Dear Ms. Hill-Karbowski:

The amendment you submitted on April 16, 2013, for your protocol number HR-2527, titled, "*A Feminist Perspective on Listening to Women: Birth Stories of Vaginal Birth Following Previous Delivery*," received expedited approval on April 17, 2013, from a member of the Marquette University Institutional Review Board.

This amendment adds phone/in-person solicitation of health care providers of potential subjects. The amendment also adds the option of potential participants to self-refer to providers for the study; providers would then contact the researcher.

Your protocol is valid until January 16, 2014. Prior to this date, you will be contacted regarding continuing IRB review. Any public advertising of this project requires prior IRB approval. If there are any changes in your protocol or adverse events, please notify the IRB immediately.

If you have any questions or concerns, please do not hesitate to contact me. Thank you for your time and cooperation.

Sincerely,



Amanda J. Ahndt, RN, MS, MSN, CIM, CIP  
IRB Manager

cc: Dr. Christopher Okunseri, IRB Chair  
Dr. Lisa Hanson, Nursing

AA/ds



## Appendix I



Office of Research Compliance

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January 7, 2014

Ms. Elizabeth Hill-Karbowski  
Nursing

Dear Ms. Hill-Karbowski:

Your protocol number HR-2527, titled "*A Feminist Perspective on Listening to Women: Birth Stories of Vaginal Birth Following Previous Delivery*" received expedited continuing approval for January 16, 2014, from a member of the Marquette University Institutional Review Board.

You are approved to recruit a total of 20 subjects of which you have recruited 13.

Any changes to your protocol must be requested in writing by submitting an IRB Protocol Amendment Form. All changes must be reviewed and approved by the IRB before being initiated, except when necessary to eliminate apparent immediate hazards to the human subjects. Any public advertising of this project requires prior IRB approval. If there are any adverse events, please notify the Marquette University IRB immediately.

Your approval is valid until January 15, 2015. Prior to this date, you will be contacted regarding continuing IRB review.

An IRB Final Report Form must be submitted once this research project is complete. The form should be submitted in a timely fashion, and must be received no later than the protocol expiration date.

Contact the IRB office if you have any further questions. Thank you for your cooperation and best wishes for a successful project.

Sincerely,

Benjamin Kennedy  
Research Compliance Officer-Human Subjects & Radiation Safetycc: Dr. Christopher Okunseri, IRB Chair  
Dr. Lisa Hanson  
Dr. Sherri Lex, Graduate School

BK/jn