

---

Spring 4-30-2012

# An Investigation of Obstetrical Practice Patterns Through Secondary Data Analysis and Qualitative Inquiry

Barbara Shippey McAlister

Follow this and additional works at: [http://scholarworks.uttyler.edu/nursing\\_grad](http://scholarworks.uttyler.edu/nursing_grad)



Part of the [Nursing Commons](#)

---

## Recommended Citation

McAlister, Barbara Shippey, "An Investigation of Obstetrical Practice Patterns Through Secondary Data Analysis and Qualitative Inquiry" (2012). *Nursing Theses and Dissertations*. Paper 26.  
<http://hdl.handle.net/10950/72>

This Dissertation is brought to you for free and open access by the School of Nursing at Scholar Works at UT Tyler. It has been accepted for inclusion in Nursing Theses and Dissertations by an authorized administrator of Scholar Works at UT Tyler. For more information, please contact [tbianchi@uttyler.edu](mailto:tbianchi@uttyler.edu).

This page left intentionally blank

AN INVESTIGATION OF OBSTETRICAL PRACTICE PATTERNS  
THROUGH SECONDARY DATA ANALYSIS AND QUALITATIVE INQUIRY

by

BARBARA SHIPPEY MCALISTER, Ph.D. (c), RN, CNM

A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
Department of Nursing

Sally Northam, Ph.D., RN Committee Chair

College of Nursing and Health Sciences

The University of Texas at Tyler  
May 2012

The University of Texas at Tyler  
Tyler, Texas

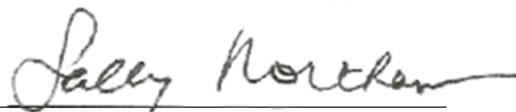
This is to certify that the Doctoral Dissertation of

BARBARA SHIPPEY MCALISTER

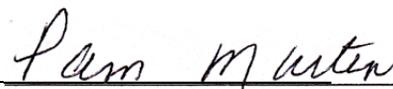
has been approved for the dissertation requirement on  
April 5, 2012

for the degree of Doctor of Philosophy in Nursing

Approvals:



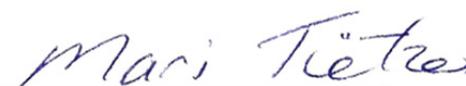
Dissertation Chair: Sally Northam, Ph.D.



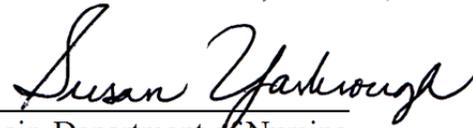
Member: Dr. Pamela Martin, Ph.D.



Member: Dr. Paul Roberts, Ph.D.



Member: Dr. Mari Tietze, Ph.D.



Chair, Department of Nursing



Dean, College of Nursing and Health Sciences

© Copyright by Barbara Shippey McAlister 2012  
All rights reserved

## Acknowledgments

I wish to extend thanks to my colleagues and family members who supported and encouraged me during my doctoral studies. To The University of Texas at Tyler faculty especially: Dr. Sally Northam, Dr. Barbara Haas, Dr. Susan Yarbrough, Dr. Gloria Duke, Dr. Pam Martin and Dr. Paul Roberts who helped me believe that I could make a difference in the world for mothers and babies. To my incredibly talented 2009 UT Tyler cohort: I am convinced God hand-picked us to walk this road together. To my Texas Woman's University family, especially: Dr. Mari Tietze, Dr. Gloria Byrd, and Dr. Stephanie Woods who exhibited steadfast faith in me. To Rebecca Burpo, CNM and Amy Giles, CNM who are my inspiration and set the gold standard for quality obstetrical care. To my children, Meredith and Gavin, who impel me to follow my dreams, and to my husband Jim, thank you for advising me to engage in full-time study; without your sage advice, this would not be over yet. And lastly to the many women who have granted me the privilege to journey with them through pregnancy and childbirth: I would not be who I am if not for your profound impact on my life.

## Table of Contents

List of Tables .....	ix
List of Figures .....	x
Abstract .....	xi
Chapter One: Overview of the Research Study .....	1
Overall Purpose of the Study .....	2
Introduction of the Articles .....	3
Chapter Two: Vaginal Birth by Maternal Choice Following the Implied Antepartum Diagnosis of Inevitable Labor Dystocia .....	5
Abstract .....	5
Manuscript .....	6
Background and Significance .....	6
Review of Literature .....	8
Maternal-fetal health consequences of cesarean section .....	8
Practice Patterns .....	9
Theoretical Framework .....	11
Methods .....	11
Case Study 1: Megan .....	12
Case Study 2: Abby .....	16
Physiologic Realities .....	21
Discussion .....	22
Nurses' Potential Impact .....	22

Conclusion .....	25
References.....	26
Chapter Three: Early Term Birth: The Impact of Practice Patterns on Rates and Outcomes <sup>1</sup> .....	29
Abstract.....	29
Manuscript .....	30
Theoretical Frameworks .....	31
Gestational Physiology .....	31
Quality Health Outcomes Model .....	33
Review of Literature .....	34
Preterm Infants.....	34
Early Term vs. Term Gestation.....	35
Shifting Trend in Gestational Ages.....	36
Practice Patterns.....	37
Design .....	39
Methods.....	39
Sample.....	40
Instruments.....	41
Statistical Analysis.....	43
Strengths and Limitations .....	44
Strengths .....	44
Limitations .....	45
Results.....	45
Demographics of Study Population .....	45
Hypotheses .....	48
Discussion.....	54

Hypothesis One.....	54
Hypothesis Two .....	54
Hypothesis Three .....	55
Hypothesis Four .....	57
Conclusion .....	58
References.....	60
Chapter Four: Summary and Conclusions.....	65
Implications for the Future.....	67
References.....	68
Appendix A: Case Study IRB Approval.....	70
Appendix B: Informed Consent.....	71
Appendix C: IRB for Protected Health Information Use.....	75
Appendix D: Secondary Analysis IRB Approval .....	79
Appendix E: IRB for Department of State Health Services .....	80
Appendix G: Biographical Sketch .....	81

## **List of Tables**

Table 1 : Summary of Client Health Data .....	20
Table 2: Birth Advocacy Resources .....	24
Table 3: Demographics: 2008-2009 Births at 37-41 Weeks.....	47
Table 4: Early Term (ET) versus Full Term (FT) Births 2008 –2009 by Elective Procedure and Associated Outcome .....	50
Table 5: NICU Admission by Birth Type.....	58

## **List of Figures**

Figure 1. Adapted Quality Health Outcomes Model .....	34
Figure 2. Percent of NICU Admissions Following Elective Delivery.....	58

## **Abstract**

### EXPLORING OBSTETRICAL PRACTICE PATTERNS FOR ELECTIVE DELIVERIES THROUGH SECONDARY DATA ANALYSIS AND QUALITATIVE INQUIRY

Barbara Shippey McAlister, Ph.D. (c), RN, CNM

Dissertation Chair: Sally Northam, PhD, RN

The University of Texas at Tyler  
May 2012

Mothers and their unborn are a vulnerable population. Despite overwhelming advances in health care and technology, the United States' indicators of maternal and infant mortality are dismal. To lay the foundation for a research trajectory ultimately aimed at improving the experiences and outcomes of pregnancy, two research projects were undertaken to investigate the impact of practice patterns for elective delivery on the current obstetrical paradigm. A qualitative clinical case study explored antepartum recommendations for cesarean section following the implied diagnoses of inevitable labor dystocia secondary to maternal physical stature in two healthy women. The women's perspectives on their experiences of leaving the traditional medical model of obstetrical care, along with their actual antepartum and intrapartum medical record data should spur conversation between all perinatal health care stakeholders. To obtain a broad view of the current obstetrical milieu, a large secondary data analysis was conducted on two years of birth certificate

data from 2008-2009 in one large southwestern United States county with high delivery rates. The study was designed specifically to explore the impact of obstetrical practice patterns across hospitals on the phenomenon of early term birth at 37-38 weeks gestation. Early term infants have consistently been reported as incurring higher rates of neonatal morbidity and mortality compared to their full term counterparts. Differences in rates of early term births across hospitals resulting from elective deliveries revealed the need for continuing education of health care providers, nurses and the child-bearing population.

## **Chapter One: Overview of the Research Study**

Despite availability of advanced technology in the American health care system, maternal and infant mortality rates are staggeringly low. According to the Central Intelligence Agency (CIA) World Factbook (2012), 50 countries demonstrate less maternal mortality than the United States. Infant mortality rates are only marginally better; the United States ranks 49<sup>th</sup> in infant mortality with approximately 6 babies dying per 1000 live births (CIA World Factbook, 2012). Changing demographics of childbearing in recent years hamper evaluation of the true picture of maternal-fetal/neonatal wellbeing. Increasing rates of plurality, delayed childbearing, and births to immigrant mothers and unwed mothers are just a few of the confounding issues that impact the obstetrical landscape (Vanderweele, Lantos, & Lauderdale, 2011).

Changing demographics alone cannot be solely responsible for the epidemiologically apparent lack of maternal-newborn health in the United States. Yet it is impossible to fully extricate the changing demographics from the parallel phenomenon of evolving obstetrical practice. Assisted Reproductive Technologies, advanced fetal surveillance techniques, inductions of labor and cesarean sections are among the drivers of the highly interventive American obstetrical paradigm. An awareness exists that interventions are likely to transpire in clusters; the term obstetric “intervention cascade” has been recognized in the literature and suggests that one intervention often begets another and yet another, not always with an optimal outcome (Cherniak & Fisher, 2008).

Debates surrounding the use of technical interventions in childbirth have escalated in recent years most often in response to the rising rate of surgical birth (Cherniak & Fisher, 2008). Cesarean delivery is the most commonly performed major surgical procedure in the United States (MacDorman, Declercq, & Menacker, 2011). Between the years 1996 to 2007, the United States cesarean section rate surged by fifty percent; there are no indications that the current rate will significantly decline in the near future (Zhang et al., 2010). Inductions are on the rise as well and have been linked as a major contributing factor to the increasing cesarean rate (Zhang et al., 2010). The Consortium of Safe Labor study across nineteen hospitals found that fifty percent of cesareans that occurred following induction of labor were performed before maternal cervical dilatation of six centimeters was reached. Subsequently, the concept of clinical impatience as a potential contributing factor to the rising surgical birth rate was introduced (Zhang et al., 2010). The management of pregnancy and labor can be an exceedingly subjective process; mothers and their unborn deserve to have evidence guide the obstetrical decisions made on their behalf.

### **Overall Purpose of the Study**

This research was undertaken to form the foundation for an anticipated research trajectory that will target improving the experiences and outcomes of pregnancy and childbirth. Following my decision to pursue doctoral study in order to learn how to best serve mothers and their unborn through research, I evaluated my options for academic programs. The University of Texas at Tyler was the obvious choice because the doctoral program was designed to build on the inherent strengths of their students. My strengths are passion for and commitment to the vulnerable maternal-fetal population

## Introduction of the Articles

The first manuscript is a qualitative clinical case study report that relates the perspectives of two women of disparate physical statures who refused their health care providers' antepartum recommendations for cesarean section. Actual antepartum and intrapartum data from the women's health records illustrate clearly that cesarean sections can be suggested by health care providers prior to the onset of labor without sufficient justification. Two powerful women prevented themselves and their offspring from becoming casualties of their health care providers' highly interventive practice philosophies. Their stories raise meaningful questions about patient self-advocacy, women's rights to attempt vaginal deliveries, and current obstetrical practice patterns.

The second manuscript provides a broad perspective of current obstetrical practice patterns. It details the results of a secondary data analysis of over 85,000 births from 2008-2009 in one densely populated southwestern United States county. The focus of the study was to investigate the impact of obstetrical practice patterns on rates and outcomes of early term birth. Early term infants, those born at 37-38 weeks gestation, incur higher rates of morbidity and mortality compared to their full-term counterparts (Fleishman et al., 2010). Insight into the related trends of increasing inductions, cesarean deliveries, and early term births has only occurred in the last 5 years. In an effort to inform obstetric health care providers about the dangers of early term birth, the March of Dimes launched the *Less Than 39 weeks Toolkit* in 2010 to assist hospitals in eliminating elective deliveries without maternal-fetal indication (March of Dimes, 2011). The March of Dimes has also engaged leaders, researchers, and clinicians from the 5 highest delivery states (Texas, Florida, California, Illinois, and New York) to examine the problem. This

initiative has been termed the Big 5 Prematurity Collaborative (Berns, 2009). As a participant in the Big 5 Collaborative, my doctoral advisor, Dr. Sally Northam is coordinating the dissemination of the results of this research to the March of Dimes so that the results may be used to guide educational efforts and refinement of practice patterns.

**Chapter Two: Vaginal Birth by Maternal Choice Following the Implied  
Antepartum Diagnosis of Inevitable Labor Dystocia**

**Abstract**

Two healthy pregnant women received antepartum recommendations from their health care providers to schedule cesarean births. In response, both women, one obese and one of extremely small stature, decided to seek health care providers who would support their desire to attempt vaginal birth. The women's perspectives on their successful vaginal birth experiences along with the pertinent medical record data from their pregnancies and deliveries provide a glimpse into current controversial obstetrical practices.

*Keywords: advocacy, birth center, birth choice, cesarean, natural birth, informed consumer, nurse-midwives, vaginal birth*

## **Manuscript**

Despite the apparent growing acceptance of cesarean section without medical indication, some women still consider vaginal delivery the preferred method of childbirth. This article expands the dialogue regarding the impact that informed obstetrical consumers can have upon their own health care outcomes. The stories of two women, one with a Body Mass Index (BMI) of 38.3 and one of extremely small stature, who received antenatal recommendations for cesarean sections from their hospital-based health care providers (one an Obstetrician, the other a Certified Nurse Midwife) are recounted. Both women left these health care providers and transferred their care to new providers who agreed to support their desire for vaginal birth. The unique combination of the clinical case study model coupled with the narrative case study approach reveals the actual data from maternal-newborn health records as well as the women's perspectives on their decisions to pursue vaginal birth.

### **Background and Significance**

According to 2011 National Vital Statistic Reports, the average rate of cesarean section births in the United States for 2009 was 32.9% (Martin, et al., 2011). This figure represents an almost 60% increase in national cesarean rates since the most recent low in 1996 (Martin et al., 2011). According to the National Vital Statistic Reports the repeat cesarean delivery rate was nearly 90% in 2003 (Menacker, 2005). Today surgical delivery is viewed by many health care professionals and consumers as a desirable option (Hewer, Boschma, Hall, 2009; McAra-Couper, Jones, & Smythe, 2010).

Increasing cesarean rates and the emerging socio-cultural acceptance of surgical birth have been influencing both research and controversy. Cesarean sections were formerly reserved only for select high risk maternal-fetal dyads and failed attempts at vaginal birth (Sewell, 1993). However in the 1990's the term "elective cesarean" began appearing in the medical literature with some regularity. Popular media began devoting significant attention to this new concept of cesarean by maternal choice. Yet Childbirth Connection's *Listening to Mothers II* survey indicated that out of nearly 1600 women, only one reported that despite lack of Obstetrical/medical complications, she had requested a scheduled cesarean birth (DeClerq, Sakala, Corry, & Applebaum, 2007). Meanwhile the American Congress of Obstetricians and Gynecologists (ACOG) estimated that 2.5% of all cesareans could be attributed to maternal request (2007). Adams et al. (2010) contended that although the actual numbers of Cesarean Deliveries by Maternal Request (CDMR) are thought to be quite low, it is the mere recognition of CDMR as an acceptable paradigm in obstetrics that heralds the demise of long held psychological barriers to cesarean delivery. "If a physician elects a cesarean delivery for no indication, why hesitate when there is an equivocal indication?" (Adams et al., 2010, p. 36).

Although there is now much to be found in the scientific literature about cesarean delivery on maternal request, there is negligible information available on the topic of vaginal delivery by maternal choice or vaginal delivery for maternal philosophy. The case studies that follow relate the story of two women, who, had it not been for belief in both their health and innate power to birth, would have become contributors to the rising cesarean rate. The primary purposes of this article are to provide a venue for these stories

to be told, inspire frank conversations among nurses regarding the intricacies of the rising cesarean rate, incite nurses to become involved in maternal-fetal advocacy and education efforts, and ultimately to provide foundation for future research into the topic of highly interventive obstetrical practices.

## **Review of Literature**

### **Maternal-fetal health consequences of cesarean section**

The obvious question and arguably the most crucial one involves the safety of cesarean section for both the mother and her newborn in comparison to vaginal birth in the low-risk client. As the number of cesarean sections rises, concern about short and long term maternal-fetal complications grows (Clark & Silver, 2011). The surging primary cesarean section rate and the accompanying declining vaginal birth after cesarean (VBAC) rate of less than ten percent (MacDorman, Menacker, & DeClerq, 2008) demonstrate that for women with a primary cesarean who desire more than one infant, repeat surgical birth is to be anticipated.

Mounting evidence suggests that maternal-fetal risks increase with every subsequent cesarean birth. Repeat surgical birth has been linked to a variety of maternal complications, including but not limited to adhesions, bladder injury, hysterectomy, infection and infertility (Adams, Hirsch, Macgregor, Kirschner & Silver, 2010; Lyell, 2011). The risk of abnormal placentation increases with each subsequent cesarean and has been linked to serious complications such as hemorrhage, hysterectomy and maternal death (Bauer & Bonano, 2009; Boutsikou & Malamitsi-Puchner, 2011; Clark & Silver, 2011; Yang et al., 2007).

Mothers do not incur the increased risks of cesarean section in isolation. Neonates have demonstrated increased incidence of persistent pulmonary hypertension (Winovitch et al., 2011), respiratory morbidity, special care admissions, and mortality (De Luca et al., 2009). Long term potential risks of cesarean for the newborn include breastfeeding difficulties (Zanardo, 2010), as well as increased likelihood of developing asthma and Type I diabetes (Steer & Modi, 2009). Large cohort studies over the past decade have produced conflicting evidence regarding the relationship of repeat cesareans to stillbirths and highlight the need for more investigation of this potentially devastating outcome (Clark & Silver, 2011).

### **Practice Patterns**

Influences upon the increasing rates of surgical birth are of paramount interest to maternal-fetal researchers. A large secondary analysis of a decade of birth certificate data explored factors contributing to the rising rate of primary cesareans. After controlling for a wide variety of potential risk factors such as maternal age, parity, race/ethnicity, infant birth weight and a host of antepartum and intrapartum risks, no maternal medical risk profile for surgical birth was found (Declercq, Menacker, & MacDorman, 2006). Rather, the researchers surmised that shifting trends in obstetrical provider practice patterns were the predominant drivers of the increasing primary cesarean rate (Declercq et al., 2006). Healthcare provider practice patterns not only influence the timing and mode of delivery, but also impact maternal and neonatal outcomes (Oshiro, et al., 2009; The Ohio Perinatal Quality Collaboration Writing Committee, 2010).

This pervasive issue of provider practice patterns is becoming more widely discussed within the healthcare community and scientific literature. Physician practice

patterns in the context of cesarean section were investigated through a fifteen year longitudinal study; heterogeneity within markets was revealed, while notable similarities were demonstrated across markets (Epstein & Nicholson, 2009). Attributes such as gender, race, and location of obstetrical residency had little effect on physicians' adjusted cesarean rates. One-third of the variations in practice were linked to the individual perceptions of physicians regarding the suitability of obstetrical management approaches (Epstein & Nicholson, 2009). This finding both highlights the wide range of provider philosophies encountered by women in their communities and reinforces the importance of women being well equipped with evidence based information before their first encounter with a potential obstetrical provider.

The American Congress of Obstetricians and Gynecologists (ACOG, 2008) advises physicians to explore and address patient concerns when cesareans are requested without medical indication. Still ACOG contends that in light of a dearth of substantive research, "it is currently not ethically necessary to initiate discussion regarding the relative risks and benefits of elective cesarean delivery versus vaginal delivery with every pregnant patient" (2008, p. 246). This guideline then summarily conveys that the United States' professional organization of obstetrical care providers does not recognize vaginal delivery as the optimal mode of childbirth. If obstetricians do not believe there is yet convincing data to support a trial of labor for every potentially capable client, it follows then that women themselves must be well informed about their prospective childbirth choices.

## Theoretical Framework

The Quality Health Outcomes Model provides the framework through which this case study was conceptualized. The four constructs represented in the model are: *system* (individual, organization, or group), *interventions*, *outcomes*, and *client* (individual, family, or community); each construct interacts reciprocally, with the exception of *interventions* and *outcomes*. These two components interact exclusively through the mediation of the *system* and/or *client* (Mitchell, Ferketich, & Jennings, 1998). In this case study, both of these *clients* were offered *interventions* by the *system*, rejected the recommended *interventions* for their baby's birth, and in doing so produced *outcomes* for themselves and their newborns. According to the Quality Health Outcomes Model, the *outcomes* for each client will have repercussions not only for themselves, their family and community (*client*), but also for the *system* (hospitals, physicians, nurses) (Mitchell et al., 1998).

## Methods

Institutional Review Board approval was obtained from the university, the birth center, and the participants. Both women's cases were known to the researcher through her previous professional affiliation with the birth center. They were initially chosen because each woman was offered a cesarean, but was not convinced of the validity of the indications for the recommendation and subsequently changed providers. Sandelowski (2010) explained, "Although cases are initially selected for study because they are deemed to represent a certain larger class of cases, what these case studies are ultimately considered to represent is a key outcome of case studies" (p. 3). The researcher's reflection on what these cases have come to represent will be discussed later.

Each audio-taped interview lasted approximately 90 minutes. Interviews were conducted solely between the researcher and the client during non-business hours at the birth center where the clients delivered their newborns. Interviews were transcribed verbatim immediately following the interview appointments in order that content would be readily familiar to the researcher. Both clients were given the opportunity to validate the content of their stories and to confirm, delete or amplify content. The clients' stories along with their actual medical records were analyzed for similar themes and implications for informing and impacting the System, Clients, Interventions and ultimately Outcomes.

### **Case Study 1: Megan**

Megan was a 5 feet, 8 inch, 247 pound Gravida 2, Para 0 whose mother and sisters had given birth naturally. Megan considers serving as the videographer at her sister's natural birth an especially formative experience during her adolescence. When she began planning for her own childbirth experience, she was very open to all the options available for labor and delivery. Her friends were seeking their prenatal care from obstetricians. Megan decided that she should do the same, believing that she was choosing the safest option for herself and her baby. As soon as her pregnancy was confirmed she began frequent, regular visits to her local library and starting educating herself on all things related to birth. It was from these resources that Megan learned about doulas.

*“It was during my fourth or fifth visit to the obstetrician when I asked her what she thought about the use of doulas. Her immediate response to me was, “I hate it.” My husband and I fired her immediately. We knew we wanted a health care provider that would at least engage in a dialogue about birth options.”*

Next Megan found a certified nurse midwife (CNM) who had hospital privileges in a physician led practice. She thought that she had found the best of both worlds, the individualized care that is one of the hallmarks of midwifery, along with the safety of a back-up physician and a hospital. The prenatal care visits were going well, but one day Megan arrived at her appointment to find that her midwife had left the practice and that there was a another midwife in her stead. The new midwife recommended a third trimester sonogram to assess for fetal weight. Although Megan did not feel this was necessary, she acquiesced. During the follow-up visit, the CNM told Megan that the fetus was already 8 pounds, and that by term Megan could expect her son to weigh ten pounds. The midwife determined vaginal birth would be unsafe and recommended to Megan that she should schedule her cesarean.

*“My jaw dropped to the floor. I remember thinking “this is insane.” I talked to my husband, my sisters, and my mother. With their support, I called a local birth center that afternoon and threw myself at their mercy. I begged the midwives to please take me on as client even though it was so late in the pregnancy. This is when I learned that planning for childbirth was not about “shoulds;” it was about believing in what my body was designed to do. This is when I really started to question medicine and societal norms.”*

Megan remembers feeling an incredible sense of relief when the midwives accepted her as a client. She described the midwives in the birth center practice as supportive, affirming, knowledgeable and experienced.

*“Suddenly there was a huge weight off my shoulders. I suppose it had always been in the back of my mind that at the hospital my attempt at natural labor would not really be supported. Sure changing providers again, especially at the end of pregnancy felt a bit*

*scary, but I knew I was finally with the health care providers who would help me achieve the birth I wanted.”*

Friends and co-workers were uneasy about her choice. Megan recalls her news being greeted with lots of raised eyebrows. Her active questioning and abandonment of the traditional medical model of childbirth made her peers uncomfortable. Although Megan’s BMI classified her as obese, she reports never considering herself a high risk client. She ate extremely carefully during her pregnancy, but did not diet, and she walked regularly. Despite being overweight, Megan was normotensive throughout her pregnancy. She maintained an active lifestyle and recalls consistently feeling healthy and capable throughout her pregnancy.

*“I felt confident about my health and the health of the baby.”*

Labor began with a lengthy prodromal phase. Megan describes the long build up to regular contractions as “very, very fun.” With her husband wearing a stop watch around his neck, timing the sporadic contractions, they stayed up through the night in anticipation of the formal start of active labor. By morning they decided they should go to the birth center to be assessed; she had progressed to 3cm dilation, but was still not experiencing a regular contraction pattern. So Megan, her husband and mother went to a local office supply store to shop and pass the time. When they returned to the birth center, Megan’s cervix was 5cm and she was coping quite well. She characterized her labor as very relaxed and gradual.

*“When we first got back to the birth center, I just hung out downstairs with my husband, mom, and the midwives. There was no drama. No rushing around. No frenzied paperwork completion. I was very relaxed. Eventually I went upstairs to the birthing suite. It never*

*crossed my mind that my body wouldn't work. Before long I was pushing out our eight pound son. It was a physical and emotional release. I felt very empowered. Our son's birth ended up being exactly everything I ever wanted."*

Megan described her reflections on her experience during the weeks that followed her son's delivery.

*"I felt so empowered and inspired by my experience. When I think of what I went through during my pregnancy, it makes me sad and worried for other women. I realize that if this happened to me, the recommendations for cesarean sections must be being made to lots of other women. Birth is treated as a medical condition. The women who don't know better are missing out on a beautiful experience. I have friends and peers now who are pregnant and in great physical shape who are being encouraged by their health care providers to schedule their primary cesareans, even in the first and second trimester. This just floors me."*

Megan credits her mother for instilling in her the belief that she could do anything she set her mind to do. She feels that her mother's belief in her ability to birth, along with extensive self-education, was the key contributor to her success. She describes herself as always having been a confident woman, but that childbirth took her confidence to new heights.

*"I know that I gave my son the best gift possible, a natural birth. No one else could provide that for him but me, and I did it. I really did something meaningful for our son at the very beginning of his life!"*

The confidence and empowerment that Megan gained from her son's birth have remained with her. She explained that she was in an unacceptable work situation and

knew that it was time to resign. Megan shared that prior to her son's birth, she would have written a letter and slipped it under her boss' door without any confrontation. She credits her childbirth accomplishment as giving her the strength to stand up for herself, look her boss in the eye, and resign.

*“Pursuing and achieving the birth I envisioned has paid lasting dividends. Being able to advocate for myself through that uncomfortable work situation was amazing. Taking care of myself and my family in that way is a great feeling.”*

Megan remains a committed birth advocate and is always willing to share if someone asks to hear her birth story. She wishes that she could encourage all healthy women to have this same kind of life changing birth experience that she did.

*“To any woman whose health care provider is suggesting a cesarean, I would say: “Do your research. Ask questions. Get different people's perspectives.” I would tell my story. I would show them the science-their body is built to birth.”*

### **Case Study 2: Abby**

Abby was a 26 year old, 4 feet, 10.5 inch, 95 pound primigravida. Six years prior, the client's sister had experienced her first pregnancy. Frequent communication with her older sibling regarding her choice to experience natural childbirth piqued Abby's own curiosity about childbirth. Consequently she began independently researching and educating herself about the topic. By the time Abby became pregnant, she had established her own philosophy about pregnancy and determined that she wanted to understand what was happening to her body and her fetus.

*“In matters of great importance such as growing and delivering my baby, I wanted to know everything there was to know...not necessarily control everything, but be completely informed and involved. Childbirth was something I wanted to do.”*

Thrilled to be pregnant, she sought prenatal care at eight weeks gestation having chosen her health care provider based upon insurance coverage and proximity to her home. Her routine obstetrical visit records revealed a completely negative medical/surgical history and an entirely normal physical examination. Following her physical exam, Abby and her spouse discussed their desire for natural childbirth with their newly selected obstetrician. Abby recalls directly asking her female physician if she believed in her ability to birth vaginally. The physician responded that due to Abby’s short stature, she would definitely recommend birth by cesarean section. Instead of feeling anger toward the physician, Abby views the obstetrician’s frankness as ultimately positive in her case. Abby is convinced that had the doctor not admitted her lack of faith in Abby’s ability to birth, that the physician–client relationship would have eventually become antagonistic secondary to their lack of shared perspective regarding the desired outcome.

*“My doctor made it clear that she believed a woman of my size would not be able to deliver vaginally, much less naturally.”*

Committed to her well developed vision of natural childbirth, the client sought care at a local birthing center staffed by certified nurse midwives. Abby recalls feeling very comfortable, safe and cared for by the CNMs. The practice was minutes from a well respected hospital and the CNMs enjoyed a collegial relationship with a local obstetrician. Trustworthiness, professionalism and respectfulness are the attributes of the

midwives that Abby recalls from their first meeting. Thankfully Abby's husband agreed with her impressions of the obstetrician and supported her desire to find another provider. He was open to the idea of out of hospital birth and fully engaged with the pregnancy, attending many antepartum visits and Bradley prepared childbirth classes. Abby's mother, despite her oldest daughter's natural birth, was still at first quite hesitant about Abby's prospective of out of hospital birth. However, after meeting the midwives, witnessing the personalized care that was afforded her daughter, and hearing her granddaughter's heartbeat for the first time, Abby's mom became more open to her daughter's choice of birth location.

*“My mom was impressed with the birth center's statistics on maternal-newborn health outcomes. She had all her questions answered by the midwife. After that prenatal visit with me, mom never said another negative word about my choice of birth locations.”*

Beyond her immediate family, Abby's friends and co-workers provided mixed reactions about her decision to receive care from a team of certified nurse midwives and deliver at a freestanding birth center. She remembers seeing expressions of shock on their faces and hearing comments such as “better you than me.”

*“Overall I would describe the reactions as cautious, leery, and disbelieving. People are hesitant to accept the unknown. They have absolutely no idea what they are missing. But I work at a hospital and see that birth is most often treated as an ailment, not a blessing. This awareness just strengthened my resolve to have a different kind of experience. I remember reflecting on birth and postpartum scenarios that I witnessed while working at the hospital and thinking that I want much more for myself and my*

*baby. I wanted to be an active participant and decision maker throughout my pregnancy and childbirth experiences, not merely told what to do.”*

Abby shared that she did have friends who were a bit interested in the concept, but just didn't believe they could handle the rigors of natural childbirth. She commented that some women merely follow tradition and evidently don't care enough about the actual process to invest the time it takes to adequately investigate the evidence. Abby concluded her speculations about women by thoughtfully stating that maybe some women feel that they just cannot ask their partner to support them in such an intense way.

Eventually Abby's due date came and went. Her concern turned from thoughts of what labor would be like, to whether or not the natural vaginal birth was really going to happen. She reported being a “hysterical mess” at the prospect of having to go the hospital for an induction. She and her husband consulted with the CNM about options. They decided to use a regimen of blue and black cohosh to attempt to stimulate labor. Eventually contractions started in the late afternoon; by the time she arrived at the birth center for an examination she was dilated to 3 centimeters. She coped with early labor downstairs at the birth center and was formally admitted to the upstairs birthing suite when her cervix was 4-5 centimeters dilated.

*“It was surreal. I was calm, controlled and not afraid. My husband lit candles and we listened to Enya. I felt ready. Nothing was going to stand in my way. I had my full armor on. It just flowed. I got in the shower. The midwife made sure I stayed hydrated. I felt safe in the care of my husband. The CNM was very hands on, but most of all she encouraged us to work together as a couple. I got out of the shower, and walked around in between contractions; eventually they got more intense, so I got in the birthing tub. My*

*husband got in with me and I leaned back on his chest. Soon I felt like pushing; I didn't have to push long at all; it was less than 15 minutes. I heard my husband announce, "It's a girl.""* Her face lit up as she concluded, *"I have not been the same ever since."*

Table 1: Summary of Client Health Data

	Client 1/Megan	Client 2/Abby
Age	29	26
Height	5'8''	4'10.5''
Weight (entry into care)	247	94
Weight (at delivery)	252	123
Medical History	Non-contributory	Non-contributory
Obstetrical History	G2P0	G1P0
Antepartum Physical	Within normal limits	Within normal limits
Pregnancy Complications	UTI/treated at 33.4 weeks	Group B Strep +/treated with 2GM Ampicillin per IV during labor
Blood pressure 36 wks.	114/77	110/62
Blood pressure at term	108/66	118/78
Gestational age at delivery	40 2/7	41 2/7
Onset of labor	Spontaneous	Blue & black cohosh
Amniotic fluid	Clear	Clear
Blood pressure: labor	118/70	100/60
Fetal Heart Tones: labor	130's -150's-no decelerations	140's-160's – no decelerations
Pain relief:	Nalbuphine	None
Pharmacological Pain relief:	hydrochloride 10 mg	
Non-Pharmacological	Ambulation, shower, birthing ball, tub	Ambulation, position changes, tub
Length of Stage One	8 hours, 25 minutes	7 hours, 45 minutes
Length of Stage Two	45 minutes	11 minutes
Length of Stage Three	30 minutes	19 minutes
Estimated Blood Loss	500cc	<500cc
Perineal Integrity	1 <sup>st</sup> degree vaginal laceration repaired with 3-0 Absorbable suture/5cc 1% Lidocaine	Labial laceration repaired with 3-0 Absorbable suture/3cc 1% Lidocaine
Postpartum Complications	None	None
Apgars at 1 & 5 minutes	9/9	8/9
Newborn Weight	8lbs. 0oz.	7lbs. 10oz.
Newborn Complications	None	None
Maternal/Fetal complications first 6 weeks after delivery	None	None

## **Physiologic Realities**

As meaningful as autonomy, empowerment, and the fulfillment that comes from living out the realization of one's vision for birth are, the most crucial consideration must be the health and safety of the maternal-fetal unit. As the data from Table 1 indicate, both of these women enjoyed normal labor and delivery experiences. One began labor naturally, the other after a regimen of black and blue cohosh. Both women maintained normal vital signs throughout labor, and their not yet born infants maintained normal fetal heart rates. They both utilized a variety of comfort measures throughout labor including ambulation, position changes, the birthing ball and hydrotherapy. One relied solely on non-pharmacological methods of pain relief, while the other received one 10 mg dose of Nalbuphine hydrochloride intramuscularly to take the edge off of the contraction discomfort. The time from onset of active labor to through delivery was under ten hours for each of these primiparas. Of note, also were the short second stages of labor, 45 minutes for Megan, and only 11 minutes for Abby. Blood loss for both clients was within normal limits. Both sustained first degree lacerations which were easily repaired by the certified nurse midwife following administration of local anesthesia. It is worth noting that Megan's baby, predicted by sonogram to be ten pounds at term, weighed only eight pounds. Neither of the new mothers incurred postpartum complications. Both of their infants made smooth transitions to extra-uterine life and remained free of complications during the months following their births.

The maternal-fetal outcomes for these two birth scenarios illustrate very different realities than would have transpired if each woman had not actively engaged in the decision making process about their child's birth. Cesarean sections would have deprived

Abby and Megan of what they consider to be pivotally empowering experiences. Each woman would have incurred major abdominal surgery, increased pain, longer recovery time, increased costs, and diminished likelihood of fully enjoying their initial bonding experiences with their newborns. Perhaps most significantly, they would have sacrificed their opportunity to ever attempt vaginal birth, a process which both Abby and Megan have each had the joy of experiencing for a second time.

### **Discussion**

Experienced labor and delivery nurses know when a laboring woman on either end of the size spectrum enters the intrapartum unit, the likelihood for complications and an intervention is increased. Indeed the literature is replete with examples of how disparities in maternal habitus heighten the chances of complications of labor and delivery and subsequently, cesarean sections (Barau et al, 2006; Benjamin, Daniel, Kamath, & Ramkumar, 2012; Bergholt, Lim, Jorgensen, & Robson, 2007; Bohlman, et al., 2010; Fyfe et al., 2011). However, both of these case studies clearly illustrate that neither small stature nor obesity alone should relegate a pregnant woman to scheduled pre-labor surgical birth.

### **Nurses' Potential Impact**

When a client arrives on the labor and delivery unit for a scheduled cesarean that has been recommended by her provider, it is too late for the nurse to begin attempting to empower the woman to question the wisdom of this plan of care. Such interference could easily be considered disrespectful to the health care provider, and quite possibly even labeled insubordination and grounds for dismissal. Neither would such a conversation benefit the client in that moment. She and her significant other have presumably arrived

on the unit with a sense of peace that cesarean birth is the right decision for the right reasons. In great anticipation of meeting their baby, they have placed their complete trust and confidence in the obstetrical team's commitment to provide them optimal care. The nurse suggesting otherwise at this juncture would be potentially damaging to the client's physiological and psychological responses to the impending surgery.

So then are nurses impotent to stem the tide of the rising cesarean rate for those clients who are capable and willing to achieve vaginal birth? Hardly. As members of the most trusted profession in the country, (Jones, 2010) savvy nurses are crucial stakeholders in the health care arena. In the context of the Quality Health Outcomes Model (Mitchell et al., 1998) nurses are both members of the community (*clients*) and the *system*. By capitalizing on their simultaneous dual roles, nurses can influence the existing model of obstetrical health care delivery. The high school or college classroom, the family dinner table, health fairs, library events, book or journal clubs, and age appropriate Sunday School classes are all possible vehicles through which nurses can enlightening the public. Opportunities to influence the future childbearing client and the obstetrical paradigm at large are only limited by nurses' imaginations. One thing is for certain, the vast majority of these opportunities will not present themselves; nurses must embrace the responsibility for envisioning and creating scenarios to convey evidence-based childbirth information. Abundant resources are available for expanding nurses' expertise in birth advocacy efforts. (Table 2)

Table 2: Birth Advocacy Resources

Organizations	Links
American College of Nurse-Midwives	<a href="http://www.acnm.org">www.acnm.org</a>
Childbirth Connection	<a href="http://www.childbirthconnection.org">www.childbirthconnection.org</a>
Choices in Childbirth	<a href="http://www.choicesinchildbirth.org">www.choicesinchildbirth.org</a>
Coalition To Improve Maternity Services	<a href="http://www.motherfriendly.org">www.motherfriendly.org</a>
Videos	Links
Natural Born Babies	<a href="http://www.naturalbornbabies.com/main/trailer">www.naturalbornbabies.com/main/trailer</a>
The Truth About C-Sections	<a href="http://www.youtube.com/watch?v=7zDnigbvPvk">www.youtube.com/watch?v=7zDnigbvPvk</a>
Book Titles	Authors
Birth Models That Work	Robbie Davis-Floyd
Born in the USA: How a Broken Maternity System Must be Fixed to Put Mothers and Infants First	Marsden Wagner
Pushed: The Painful Truth About Childbirth and Modern Maternity Care	Jennifer Block
Understanding the Dangers of Cesarean Birth	Nicette Jukelevics

The origins of both Megan and Amy’s decisions to pursue vaginal birth can be traced to someone informing them about the maternal-fetal benefits of vaginal birth. As the number of women who have experienced vaginal birth dwindles, the number of women who can potentially share their birth stories to enlighten future mothers is concurrently declining. This truth only heightens the need for nurses to consider their spheres of influence and quickly become involved in childbirth advocacy efforts. Nurses, by investing only small increments of their time, can together positively impact the current culture of highly interventive obstetrics.

## **Conclusion**

The literature does indicate an increased risk of primary cesarean section for those nulliparas of either short stature or high BMI. Nevertheless, those statistics do not provide sufficient justification for depriving otherwise healthy women of disparate sizes the opportunities to attempt vaginal birth. The stories of Megan and Abby remind us that women of all sizes and shapes have bodies quite capable of birthing safely and should be afforded the chance to do so. Preventing “unnecesareans” will yield physiological, psychological, and fiscal benefits. Society passionately promotes a woman’s right to use contraception and obtain safe abortions. Where is our collective passion for reminding women that exploring their body’s capacity to birth is a worthwhile pursuit?

## References

- Adams, M.G., Hirsch, E., Macgregor, S.N., Kirschner, C.V. Silver, R.K. (2010). How should we respond to the trend of increasing cesarean delivery? *Contemporary OB/GYN*, 55(6), 30-38.
- American Congress of Obstetricians and Gynecologists. (2007). ACOG committee opinion no. 394: Cesarean delivery on maternal request. Retrieved from [http://www.acog.org/Resources\\_And\\_Publications/Committee\\_Opinions/Committee\\_on\\_Obstetric\\_Practice/Cesarean\\_Delivery\\_on\\_Maternal\\_Request](http://www.acog.org/Resources_And_Publications/Committee_Opinions/Committee_on_Obstetric_Practice/Cesarean_Delivery_on_Maternal_Request)
- American Congress of Obstetricians and Gynecologists. (2008).ACOG committee opinion no. 395: Surgery and patient choice. *Obstetrics and Gynecology*, 111(1), 243-247.
- Barau, G., Robillard, P., Hulsey, T.C., Dedecker, F., Lafitte, A., Gerardin, P., Kauffmann, E. (2006). Linear association between maternal pre-pregnancy body mass index and risk of caesarean section in term deliveries. *British Journal of Obstetrics and Gynaecology*, 113(10), 1173-1177.
- Bauer, S. T. & Bonano, C. (2009). Abnormal placentation. *Seminars in Perinatology*, 33(2), 88-96.
- Benjamin, S.J., Daniel, A.B., Kamath, A., Ramkumar, V. (2012). Anthropometric measurements as predictors of cephalopelvic disproportion. *Acta Obstetrica et Gynecologica Scandinavica*, 91(1), 122-127.
- Bergholt, T., Lim, L.K., Jorgenson, J.S., Robson, M.S. (2007). Maternal body mass index in nulliparous women in spontaneous labor. *American Journal of Obstetrics and Gynecology*, 196(2), 163.e1-5.
- Bohlman, M.K., Luedders, D.W., Beyer, D., Kavallaris, A., Baumann, D., Diedrich, D., Hornemann, A. (2010). Nulliparous patients with small stature delivering at term have an increased risk of secondary cesarean section. *Archives of Gynecology and Obstetrics*, 282 (3), 241-244.
- Boutsikou, T. & Malamitsi-Puchner, A. (2011). Cesarean section: impact on mother and child. *Acta Paediatrica*, 100(12), 1518-1522.

- Clark, E.A.S. & Silver, R. M. (2011). Long-term maternal morbidity associated with repeat cesarean delivery. *American Journal of Obstetrics and Gynecology*, 205(6), S2-10.
- Declercq, E., Menacker, F., MacDorman, M.F, (2006). Maternal risk profiles and the primary cesarean rate in the United States, 1991-2002. *American Journal of Public Health*, 96, 867-872.
- De Luca, R., Boulvain, M., Irion, O., Berner, M., & Pfister, R.E. (2009). Incidence of early neonatal mortality and morbidity after late-preterm and term cesarean delivery. *Pediatrics*, 123, e1064-e1071.
- Epstein, A.J. & Nicholson, S. (2009). The formation and evolution of physician treatment styles: An application to cesarean sections. *Journal of Health Economics*, 28, 1126-1140.
- Fyfe, E.M., Anderson, N.H., North, R.A., Chan, E.H., Taylor, R.S., Dekker, G.A., McCowan, L.M.(2011). Risk of first-stage and second-stage cesarean delivery by maternal body mass index among nulliparous women in labor at term. *Obstetrics and Gynecology*, 117(6), 1315-1322.
- Hewer, N., Boschma, G., & Hall, W.A. (2009). Elective caesarean section as a transformative technological process: players, power and context. *Journal of Advanced Nursing*, 65(8), 1762-1771.
- Jones, J.M. (2010). Nurses top honesty and ethics list for 11<sup>th</sup> year. Gallup Economy. Retrieved from <http://www.gallup.com/poll/145043/Nurses-Top-Honesty-Ethics-List-11-Year.aspx>
- Lyell, D.J. (2011). Adhesions and perioperative complications of repeat cesarean delivery. *American Journal of Obstetrics & Gynecology*, 205(6), S11-18.
- MacDorman, M.F., Menacker, F., Declercq, E. (2008). Cesarean Birth in the United States: Epidemiology, Trends, and Outcomes. *Clinics in Perinatology*, 35, 293-307.
- Martin, J. A., Hamilton, B.E., Ventura, S. J., Osterman, M.J.K., Kirmeyer, S., Mathews,T.J., Wilson, E. (2011). Births: Final Data for 2009. *National Vital Statistics Reports*, 60(1), 1-104.
- McAra-Couper, J., Jones, M., Smythe, E. (2010). Rising rates of intervention in childbirth. *British Journal of Midwifery*, 18(3), 160-169.
- Menacker, F. (2005). Trends in cesarean rates for first births and repeat cesarean rates for low-risk women: United States, 1990-2003. *National Vital Statistic Reports*, 54(4).

- Mitchell, P., Ferketich, S., & Jennings, B. (1998). Quality health outcomes model. *Journal of Nursing Scholarship, 30*(1), 43-46.
- Oshiro, B.T., Henry, E., Wilson, J., Branch, D.W., & Varner, M.W. (2009). Decreasing elective Deliveries before 39 weeks of gestation in an integrated health care system. *Obstetrics & Gynecology, 113*(4), 804-811.
- Sandelowski, M. (2011). "Casing" the research case study. *Research in Nursing and Health, 34*(2), 153-159.
- Sewell, J. (1993). Cesarean section: A brief history. Retrieved on February 19, 2012 from <http://nlm.nih.gov/hmd/pdf/cesarean.pdf>
- Steer, P.J., Modi, N. (2009). Elective cesareans-risks to the infant. *The Lancet 374*(9691), 675-676.
- The Ohio Perinatal Quality Collaborative Writing Committee. (2010). A statewide initiative to reduce inappropriate scheduled births at 36 0/7-386/7 weeks' gestation. *American Journal of Obstetrics and Gynecology, 202*, 243e1-8.
- Winovitch, K., Pakilla, L., Ghamsary, M., Lagrew, D.C., Wing, D. (2011). Persistent pulmonary hypertension of the newborn following elective cesarean delivery. *Journal of Maternal-Fetal & Neonatal Medicine, 24*(11), 1398-1402.
- Yang, Q., Wen, S.W., Oppenheimer, L., Chen, X.K., Black, D., Gao, J., Walker, M.C. (2007). Association of cesarean delivery for first birth with placenta praevia and placental abruption in second pregnancy. *British Journal of Obstetrics and Gynecology, 114*(5), 609-613.
- Zanardo, V., Svegliado, G., Cavallin, F., Giustardi, A., Cosmi, E., Litta, P. Revisanuto, D. (2010). Elective cesarean delivery: Does it have a negative effect on breastfeeding? *Birth, 37*(4), 275-279.

## **Chapter Three: Early Term Birth: The Impact of Practice Patterns on Rates and Outcomes<sup>1</sup>**

### **Abstract**

ACOG guidelines discourage elective deliveries before 39 weeks gestation, but clinicians continue to schedule elective inductions and cesareans resulting in births at 37 0/7-38 6/7 weeks gestation. These “early term” (ET) infants incur more morbidity and mortality than their 39-41 week counterparts. Using the Quality Health Outcomes Model, 4 hypotheses were tested: Among hospitals in one southwestern US county there are different rates of: ET births; ET births preceded by elective labor induction; ET births preceded by elective cesarean section; and NICU admissions of ET infants. Analyses of 75,625 birth certificates involved 26,199 ET and 49,426 full term (FT) births in 16 hospitals. Chi Square analyses revealed significant differences in rates among hospitals for ET births, ET births preceded by elective labor induction, and ET births preceded by elective cesarean section, but no significant differences in NICU admissions. Wide variance across hospitals demonstrated practice patterns amenable to improvements.

*Keywords:* cesarean section, early term, elective, induction, practice patterns

<sup>1</sup>Dr. S. Northam, doctoral committee chair, and Dr. M. Tietze, committee member, contributed in part to this manuscript.

## Manuscript

The field of obstetrics occupies a unique place in the realm of health science. Other medical specialties are traditionally associated with detecting and correcting underlying pathology. Yet uncomplicated pregnancy is merely an experience on the continuum of life and health. Perhaps it is this very normalcy that explains why the fundamental issue of the optimal length of human gestation has been largely unexamined for decades. The convention of classifying 37 weeks as the line of demarcation between preterm and term has been traced to the Second European Congress of Perinatal Medicine held in 1970 (Fleischman, Oinuma, & Clark, 2010). Recent research suggests that this dated boundary between preterm and term gestation should be carefully examined and re-conceptualized because of its implications for maternal-fetal health care management and neonatal outcomes (Fleischman et al., 2010; Reddy et al., 2011). Mortality rates of (early term) neonates and infants of 37<sup>0/7</sup> through 38<sup>6/7</sup> weeks gestation are significantly higher than the mortality rates of infants 39 through 41 weeks gestation (Reddy, Ko, & Willinger, 2006). Furthermore, provider practice patterns such as elective labor inductions and elective cesarean sections are significantly contributing factors to these increasing rates of early term births (Ohnsorg & Schiff, 2010; Oshiro, Henry, Wilson, Branch, & Varner, 2009).

The purpose of the research study was to explore early term birth trends as well as the impact of provider practice patterns for elective inductions and cesarean deliveries on these trends. Rates of NICU admissions for early term versus full term infants provide insight regarding immediate neonatal outcomes by gestational age. Two years of birth certificate data for one United States county where birth rates are among the highest in

the country, (Texas Department of State Health Services (TDSHS), 2010) provided a substantial data set for this study.

## **Theoretical Frameworks**

### **Gestational Physiology**

Determination of the fetal gestational age is one of the most crucial contributions obstetric health care providers make toward safeguarding pregnancies. The gestational age enables clinicians to determine the due date and enables mothers to anticipate and plan for the delivery (Hunter, 2009). The gestational age calculation also guides maternal-fetal testing and provides a guideline for assessment of fetal growth (Hunter, 2009). During the third trimester when many obstetrical complications arise, sound dating criteria can provide support for pivotal decisions such as management of spontaneous rupture of membranes, rising maternal blood pressure, or suspected intrauterine growth restriction (Ananth, 2007).

For over two centuries, the first day of a woman's last normal menstrual period (LMP) has been the customary date used to calculate the length of human gestation (Varney, Kriebs, & Gegor, 2004). This basic method for calculating the estimated due date of a pregnancy is attributed to nineteenth century German Obstetrician, Frederich Naegele (Varney, et al., 2004). The simple mathematics of adding 7 days to the first day of a woman's LMP and subtracting three months, results in a predicted end of gestation after approximately 280 days or 40 weeks (Varney et al., 2004). Despite the confounding factors that diminish the reliability of this calculation such as irregular ovulation, contraceptive use or breastfeeding, Naegele's rule is still widely accepted today as the appropriate formula when using LMP for dating a pregnancy (Hunter, 2009). Technology

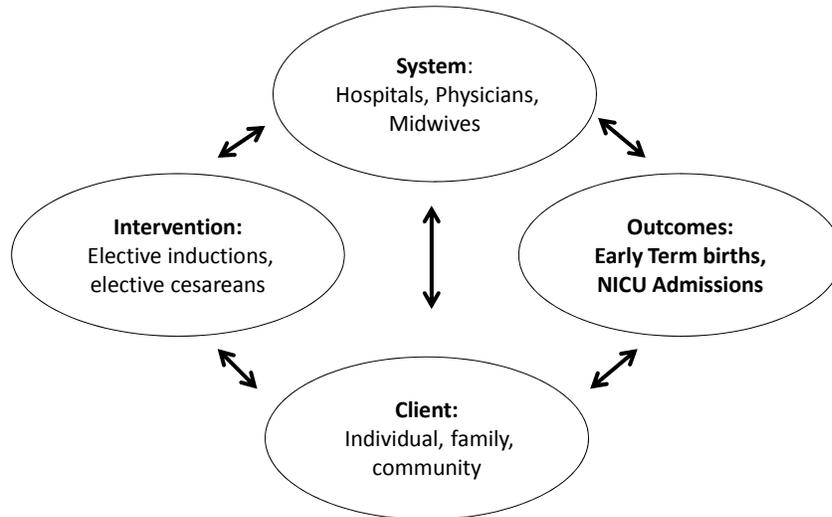
has provided some notable refinement to the process of dating pregnancies. First trimester ultrasound has been shown to provide the most accurate estimation of gestational age (Hunter, 2009). However variables such as maternal habitus, fetal position and sonographer skill can all impact dating precision (Hunter, 2009). Furthermore, not every pregnant client receives a first trimester sonogram. Some women do not enroll in prenatal care until after the first semester, while some obstetrical providers do not espouse ultrasound without medical indication. As a result of inherent flaws in both the LMP calculation and sonography, it is possible that dating discrepancies can span up to two weeks. It is then plausible that a “newborn expected to be 38 weeks could in fact be 36 weeks and at risk for conditions related to prematurity” (Bakewell-Sachs, 2007, p.68).

Barring untoward maternal-fetal complications, the physiological and developmental challenges that impact the early term infant provide rationale for health care providers to strive to maintain healthy pregnancies until at least 39 weeks. Recently the American Congress of Obstetricians and Gynecologists (ACOG) revised their labor induction guidelines to recommend that pregnancies lacking clinical indication for early delivery should not be induced before 39 weeks gestation or the establishment of fetal lung maturity (2009). ACOG (2009) also noted that fetal lung maturity alone does not constitute sufficient cause for providers to offer elective delivery. One of the strongest cases for attempting to keep the healthy unborn in utero relates to particularly critical aspects of fetal growth and development. The fetal brain undergoes marked increases in both mass and nerve growth (corticoneurogenesis) during the final weeks of pregnancy, a process best left undisturbed by unnecessary iatrogenic interventions (Adams-Chapman, 2009).

## Quality Health Outcomes Model

The Quality Health Outcomes Model (QHOM) (Mitchell, Ferketich, Jennings et al., 1998) was used to guide this study. Inspired by Donabedian's 1966 work on structure, process and outcome, the QHOM was based on the original model but changed it from being predominantly linear into a reciprocal model. The four principal components of the QHOM are: *system* (individual, organization, or group), *client* (individual, family, or community), *interventions and outcomes* (Mitchell et al., 1998). In this study, the *system* refers to the hospitals/physicians/providers and their practice patterns. *Outcomes* are the rates of early term versus full term birth and rates of NICU admissions. Elective induction and elective cesarean delivery are the *interventions* addressed by this study. The *client* component of the model represents women, their infants and their demographic or sociological attributes. (Figure 1)

# Adaptation of the Quality Health Outcomes Model



Adapted from: Mitchell, P.H., Ferketich, S., Jennings, B.M. (1998)  
Quality Health Outcomes Model. Image : Journal of Nursing Scholarship, 30(1), 43-46.

Figure 1. Adapted Quality Health Outcomes Model

## Review of Literature

### Preterm Infants

Understanding the challenges of the preterm infant provides foundation for appreciating the wisdom of maintaining healthy pregnancies until 39 weeks gestation. The preterm birth rate in the United States has increased by 36% in 25 years (Howson, Merialdi, Lawn, & Requejo, 2009) and has been identified as a research priority by the Centers of Disease Control and Prevention (Williamson et al., 2008). Preterm infants, those born at less than 37 weeks gestation, are consistently viewed as a vulnerable population. Their potential morbidities include respiratory distress syndrome (RDS), hypoglycemia, hypothermia, and hyperbilirubinemia (Bird et al., 2010; Davidoff et al.,

2006). Apnea, seizures, and feeding problems have also been identified as possible physical challenges for these fragile newborns (Raju, Higgins, Stark, & Leveno, 2006). Even more severe complications such as intraventricular hemorrhage, sepsis, white matter injury, and long-range neuro-developmental deficits are more common in preterm infants (Rebarber et al., 2009).

Health care consumers' understanding of prematurity, at least on a foundational level, has been enhanced by the media. Images of tiny newborns attached to multiple tubes while confined to isolettes contained within a neonatal intensive care unit have contributed to social awareness of these delicate infants. The March of Dimes, the internationally renowned research and advocacy organization, adopted prematurity prevention as its primary mission in 2003 and has subsequently done much to educate the public (March of Dimes, 2011). Although preterm infants exhibit a range of complications and challenges, it is widely accepted that they require expert, individualized attention to optimize their potential well-being.

### **Early Term vs. Term Gestation**

Much obstetrical and neonatal research about preterm birth uses term newborns as the comparative reference group. Although clearly further along the continuum of viability, "term gestation" is increasingly becoming an elusive concept, not only for health care consumers, but also for many health care professionals as well (Bakewell-Sachs, 2007; Ohnsorg & Schiff, 2010). These infants are frequently described as those who are at least 37 through 41 weeks gestation (Abe, Shapiro-Mendoza, Hall, & Satten, 2010; Bird et al., 2010; Qin, Hsia & Berg, 2008). Yet disparities in neonatal morbidity and length of stay have been demonstrated between those infants who were delivered

across the stratified spectrum of “term,” 37 to 41 weeks. Among infants whose mothers were induced without medical indication, both increased morbidity and length of stay were associated with those delivered electively at less than 39 weeks gestation (Clark et al., 2008; Engle & Kominiarek, 2008). Thus newborns at 37 to 38 weeks gestation incur variations of the same physiological challenges as those infants considered preterm (Reddy et al., 2011). According to Gouyon et al. (2010) neonatal morbidity and related health care costs decrease weekly until the marker of 39 completed gestational weeks. These documented differences in neonatal outcomes across gestational weeks have inspired the emergence of the classification, “early term” in the Obstetric and Pediatric literature (Engle & Kominiarek, 2008; Fleischman et al., 2010).

### **Shifting Trend in Gestational Ages**

The impact of early term birth is becoming more evident as the average duration of human gestation in the United States shortens. Birth rates for both the 34-36 weeks and 37-39 weeks groups have increased, while births beyond 40 weeks are decreasing (Davidoff et al., 2006; Martin et al., 2009). In the ten years from 1992 to 2002, the average gestational age shifted dramatically from 40 to 39 weeks (Damus, 2008). This shift was concurrent with “...a significant decline in spontaneous vaginal births and a 41% increase in interventions (i.e. inductions and cesareans) with no change in preterm premature rupture of membranes (PPROM) rate of about 3% (Damus, 2008, p. 591). The origins of this epidemiological shift are not well documented in the literature. To date no physiological evolutionary mechanism has explained why fetuses are spending less time in utero. Engle and Kominiarek (2008) purport that the gestational length shift can be linked to a wide variety of factors: the erroneous belief by health care providers and

pregnant women that fetal maturity occurs at 34 weeks' gestation, maternal autonomy, and practice patterns including elective induction or cesarean section without maternal-fetal indication. One driving force behind the growing phenomenon of maternal requests for scheduled delivery is the perceived benefit of controlling the timing of birth (Oshiro et al., 2009). Although it is widely held that most mothers would make health care decisions based on the likelihood of optimum outcomes for their infants, the majority of women have not been apprised of the dangers of early term birth (Sinha, Bewley, & McIntosh, 2011).

### **Practice Patterns**

Physician practice patterns such as induction and cesarean section directly impact the timing of deliveries and consequently neonatal outcomes (Oshiro et al., 2009; The Ohio Perinatal Quality Collaboration Writing Committee, 2010). A fifteen year longitudinal study of physician practice patterns with the subject of cesarean section as the exemplar revealed a greater variation within health care markets, as opposed to across markets (Epstein & Nicholson, 2009). Analysis of adjusted cesarean section rates by individual physician revealed that gender, race, and location of obstetrical residency program only minimally affect physicians' treatment styles. Epstein and Nicholson interpreted that almost 30 percent "... of practice variation is due to idiosyncratic physician perceptions regarding the appropriateness of specific treatments (2009, p. 1127).

Throughout the years of education, residency and practice, obstetricians' emotional and intellectual responses to patient interactions become transformed into their personal obstetric worldview, which in turn reciprocally guides their practice patterns

(Cherniak & Fisher, 2008). The unique socialization of physicians involves cognitive learning and skill development which translate into “new behaviors which are subsequently unchallenged, reinforced and presumed to be normative” (Cherniak & Fisher, 2008, p. 271.) This model of physician education can ultimately lead to the “group think” of commonly held patient care philosophies and practice styles. It is this collective professional identity that causes some physicians to eschew the research evidence and maintain practice patterns which are not supported by the scientific literature (Cherniak & Fisher, 2008).

Despite published guidelines by the ACOG that healthy pregnancies should be maintained until 39 completed gestational weeks, Oshiro et al. (2009) found that interventional practices prior to this recommended gestational marker persisted. The researchers attributed physicians’ disregard for guidelines at least in part to the reality that obstetricians are not involved in management of the care for the neonate and accordingly never associate their personal practice patterns with newborn outcomes (Oshiro et al, 2009). Other factors contributing to highly interventional practice patterns include: office hour and surgery schedule management, fiscal reward, physician convenience, and patient preference (Oshiro et al., 2009).

Recent research increasingly suggests that practice patterns impacting neonatal outcomes such as induction of labor and cesarean section should be explored. A meta-analysis by Mozurkewich, Chilimigras, Koepke, Keeton and King (2009) reported that widely utilized practice patterns related in induction of labor are not grounded in scientific evidence. A Dutch retrospective study of over 20,000 cesarean sections of singletons spanning seven years revealed a 50% elective induction rate accompanied by

significantly higher neonatal morbidity and mortality among the <39 weeks gestational age cohort (Wilmink et al., 2010). This comprehensive research elicits the question of whether or not interventions exist that can positively impact practice patterns (Macones, 2010). The Ohio Perinatal Quality Collaborative (2010) effort that resulted in a reduction of rates of elective delivery without medical indication for gestations of 36<sup>0/7</sup> through 38<sup>6/7</sup> weeks' gestation from 25% to less than 5% suggests that physician practice patterns are amenable to change.

### **Design**

Data are collected on all U.S. births by delivery sites and transmitted to state health departments. A retrospective secondary data analysis was utilized to explore the early term births in all hospitals of a large southwestern county. Birth certificate data for deliveries of singleton infants without congenital anomalies at 37<sup>0/7</sup> to 41 gestational weeks' were analyzed (TDSHS, 2009). This data set facilitated comparisons between early term births (37<sup>0/7</sup>-38<sup>6/7</sup> weeks) and those births occurring at 39 completed weeks' through 41 completed weeks' gestations by hospital. Hospital coding was maintained as confidential information that will not be published but will foster insight into practice patterns affecting gestational age outcomes.

### **Methods**

The research questions/hypotheses for the study represent a quantitative approach to the proposed inquiry. Hypotheses: Among hospitals in the study county:

H<sub>1</sub>: there are different rates of early term births.

H<sub>2</sub>: there are different rates of early term births preceded by elective labor induction.

H<sub>3</sub>: there are different rates of early term births preceded by elective cesarean section.

H4: there are different rates of Neonatal Intensive Care Unit admissions of electively delivered early term infants.

### **Sample**

All county birth certificate data for 2008-2009 comprised the accessible population. Birth certificates of single live gestation infants with gestational ages from 37 weeks through 41 weeks were included. Although the primary focus of the study was early term birth, gestations at 39 to 41 weeks served as the comparative reference group. Birth certificate data from multi-fetal pregnancies, pregnancies resulting in infants born with major birth anomalies, and infants born at less than 37 weeks and greater than 41 weeks were excluded. Following Institutional Review Board approval by the Principal Investigator's doctoral institution, approval was then obtained through the Texas Department of State Health Services (DSHS) Institutional Review Board. The Texas DSHS removed all identifying infant, maternal and paternal information. Official birth certificate data is unalterable by anyone outside of the DSHS system.

There are numerous hospitals with obstetrical services throughout the county. This research study reflects data for sixteen entities, although two of them represented here have been purchased by or merged into other entities. The decision was made to include all of the hospitals who were providing obstetric care during the years 2008-2009. Of the sixteen hospitals, only four are designated as 'for-profit' while the remaining twelve are 'not for profit;' two of them considered primarily teaching institutions (TDSHS, 2012). There number of licensed beds per facility ranged from 60 to 852. The mean number of licensed beds was 359, with a median of 251 and a standard deviation of 260 (TDSHS, 2012). Six of the hospitals do not have their own Neonatal Intensive Care

Unit. Newborns delivered at those facilities in need of intensive care services were transferred out to neighboring hospitals equipped with the appropriate resources. The hospitals reflect an eclectic mix of payer distribution trends. According to the Texas Health Care Information Center for Health Statistics (2011) over one-third of the hospitals in the county are predominantly providers of Medicaid reimbursed care; others cater primarily to privately insured patients either through a Health Maintenance Organization (HMO) or Preferred Provider Organization (PPO). However the majority of hospitals providing obstetrical care receive payment from variety of funding sources.

### **Instruments**

Birth certificates (BC) are federally devised documents designed to gather population data on births and issue an abbreviated certificate of live birth to parents documenting their infant's citizenship. The form has 65 items with some minor variance across states on items involving abortion. A list of all demographic and health related variables recorded on the Texas Certificate of live birth form can be obtained through the TDSHS website. The certificate is completed in hospitals and birth delivery sites, entered into a standardized computer program, and transmitted to both a local office that issues the birth certificate to parents and to the state department. The computer program rejects incomplete certificates thereby forcing completion of all data. All states compile the data annually and generally have a lag time of 9 to 12 months to compile all data and transmit it to the National Center for Health Statistics (NCHS). NCHS, a part of the Center for Disease Control (CDC), uses the data for analysis and reporting of national maternal and fetal health trends (Northam, Polancich, & Restrepo, 2003).

Birth certificates are the most widely used measure of infant birth and were derived by national experts who determined the items on the form (NCHS, 2001). The form is reviewed regularly by a National Center for Health Statistics committee composed of representatives from state departments of health. That committee reviews, revises, and agrees that the form is a valid measure of infant births and includes items that adequately cover the content domain so the derived data provide insight into the constructs of birth, gestational age, infant weight, and other important epidemiologic data. The data derived from the birth certificate facilitates insight and comparisons across hospitals, regions, and the U.S. (NCHS, 2001).

Criterion validity studies of birth certificate data compared the data to the medical record which is considered the gold standard (Ananth, 2005). Errors have been documented in gestational age (Martin, 2007) and obstetric procedures (Schoendorf & Branum, 2005) which are variables this study will evaluate. Systematic error that may undermine validity is recognized as a limitation when birth certificate data are used (NCHS, 2001).

Despite the shortcomings of birth certificate data, the involvement of experts in its development and revisions, the use of a consistent form by all states, the rejection of incomplete forms, and the training required of data collectors foster reliability and validity of the data. Electronic data management has unleashed significant potential for examining details of maternal-child health that were not previously possible (Ananth, 2005; Schoendorf & Branum, 2005). When used to gain a broad perspective about a perinatal phenomenon, such as rates of early term birth, use of birth certificates is appropriate (Roohan et al., 2003; Siri & Cork, 2009).

## Statistical Analysis

Descriptive statistics were used to assess maternal demographics including age, education, ethnicity, marital status and payer status. These variables were analyzed for the general study population as well as the two cohorts who incurred either elective inductions or elective cesareans at 37-38 weeks gestation (see Table 3). Operational definitions of elective inductions and elective cesareans are included below. Gestational age based on data reported in line 59 of the Texas birth certificate was utilized to categorize early term and full term births for each hospital in the county with obstetrical services. Frequencies of early term births (37-38 weeks) for each hypothesis were calculated as a proportion of total births from 37 through 41 weeks; subsequently Chi square ( $\chi^2$ ) analyses were employed to ascertain if differences exist between hospitals for each of the four hypotheses addressed. The hypothesis involving NICU admissions was explored in terms of inductions and cesareans separately.

Specific maternal health conditions and obstetric complications were conceptualized as conservative indicators of acceptable risk for induction of labor. The acceptable risk factors for induction were chosen to reflect the pregnancy risk indicators listed in section 49 of the birth certificate, 'Risk Factors in Pregnancy.' The only one of these risk factors that was eliminated was previous premature birth, since previous premature birth should not heighten a parturient's likelihood of elective induction. Premature rupture of membranes was also included as an acceptable indication for induction. Next those cases which demonstrated acceptable risk of induction were excluded from the population for Hypothesis Two. Chi Square analysis was done to

compare the differences among hospitals for elective inductions occurring for early term infants versus the full term infant cohort.

Acceptable indicators for cesarean delivery were also established from a conservative perspective. All of the acceptable risk factors delineated above for Hypothesis Two were combined with complications of labor including: chorioamnionitis, moderate to heavy meconium, non-vertex presentation, induction, augmentation, prolonged labor, fetal intolerance to labor, failed forceps, failed vacuum and previous cesarean to comprise the acceptable indicators for cesarean section. These risk factors are among those delineated in Section 54, 'Characteristics of Labor and Delivery' on the birth certificate. The population at low risk for surgical birth was identified after all those cases with identifiable risk factors were removed. Subsequently Chi Square Test of Independence comparison for differences in rates of cesarean section by hospital for early term versus full term infants was conducted.

### **Strengths and Limitations**

#### **Strengths**

Analyzing maternal-child epidemiological data is crucial to the assessment of population health. State health department records for the densely populated, socially diverse county provided a broad yet realistic glimpse of current obstetrical practices. The high volume of cases contained in this birth certificate data set facilitated substantive perinatal surveillance and educational planning efforts. This study was conceptualized in accord with the research presented at the Annual Meeting of the Society for Maternal-Fetal Medicine in 2010, which suggested that elective deliveries at <39 weeks lead to

untoward neonatal outcome and that attempts to change practice patterns should be pursued (Macones, 2010).

### **Limitations**

Select items recorded on birth certificates possess inherent challenges to reliability. For example, the variable of gestational age can be documented inconsistently. Estimated gestational age can be calculated from one or a combination of many factors: maternal recall of last menstrual period, bi-manual clinical examination or ultrasound measurements (Qin et al., 2008). Depending on the medical record management practices of providers and hospitals, there may be several conflicting recorded gestational ages. There is no way to determine if the most accurate EGA is the one being documented into the vital statistics database. Another related variable, elective induction, was reported by Bailit (2010) to be inflated eleven percent when birth certificates were compared to the corresponding medical records. Despite their shortcomings, birth certificates do provide valuable information appropriate for examining the problem of early term births across a variety of hospitals.

## **Results**

### **Demographics of Study Population**

The complete data set of births from the large southwestern United States study county during 2008 and 2009 contained 85,272 cases. The study population consisted of 75,625 birth certificates for deliveries occurring at 37-41 weeks gestation. (See Table 3) The maternal age range was 12 through 55 years. More than half of the births were to mothers between 20 and 29 years of age. Nearly one-third of the mothers were 30 through 39 years old at the time of delivery. Over 43 percent of the maternal population

achieved either their Graduation Equivalency Diploma (GED) or their high school diploma as their ultimate education. Baccalaureate education was completed by 13 percent of the mothers. The study cohort was comprised of over fifty percent Hispanic mothers, which is considerably higher than the comparative national average of one-third of the birthing population (Martin et al., 2011); white (23.6%) and black (18.1%) ethnicities cumulatively contributed to just over forty percent of the study population. Only slightly more than half, (52.2 percent) of the study group mothers were married, compared to 59% of married mothers nationally (Martin et al., 2011). Payer distribution for the study group was primarily divided into three classifications: Private insurance (42 percent), Medicaid (35.7 percent) and Self-Pay (21.8 percent).

Table 3: Demographics: 2008-2009 Births at 37-41 Weeks

	Study population		Inductions without indicated risk		Cesareans without indicated risk	
	Count	Percent	Count	Percent	Count	Percent
Mother's age						
12-19 years	9,395	12.4	522	13.5	311	7.5
20-29 years	39,773	52.6	2,059	53.1	1,855	45.0
30-39 years	24,773	32.8	1,216	31.4	1,796	43.5
40-49 years	1,679	2.2	82	2.0	163	4.0
50-55 years	5	0.0	0	0.0	0	0.0
Mother's education						
8th grade or less	2,399	3.2	98	2.5	34	2.2
9-12th grade	11,734	15.5	619	16.0	155	9.8
High School graduate/GED	32,953	43.6	1,205	31.1	397	25.1
Some college	11,403	15.1	916	23.6	293	18.6
Associate's degree	2,452	3.2	187	4.8	90	5.7
Bachelor's degree	9,901	13.1	585	15.1	406	25.7
Master's degree	3,543	4.7	197	5.1	146	9.2
Doctorate	1,213	1.6	72	1.9	58	3.7
Unknown	27	0.0	-	-	-	-
Mother's ethnicity						
White	17,839	23.6	1,284	33.1	685	43.4
Black	13,714	18.1	791	20.4	355	22.5
Hispanic	39,532	52.3	1,554	40.1	425	26.9
Other	4,540	6.0	250	6.4	114	7.2
Mother's marital status						
Yes	39,439	52.2	2,181	56.2	1,068	67.6
No	36,186	47.8	1,698	43.8	511	32.4
Payor						
Private insurance	31,758	42.0	1,680	43.3	390	24.7
Medicaid	27,006	35.7	1,760	45.4	1,047	66.3
Self pay	16,451	21.8	411	10.6	140	9.0
Other	384	0.5	26	0.7	1	0.0
Unknown	26	0.0	2	0.0	1	0.0

## Hypotheses

*Hypothesis One: Among county hospitals there are different rates of early term births.* Based on Chi Square analysis, the expected proportion of early term (ET) births to full term (FT) births was 34.6 ET: 65.4FT (See Table 4). A significant difference was found across facilities  $X^2(15, n=75,625) = 885.307, p < .001$ , two-tailed. Cramer's  $V = .108$  indicated a small effect size. Standardized residuals calculated at the  $< .001$  level of significance demonstrated that of the 16 hospitals evaluated, two had lower rates of early term births than were anticipated, while eight of the facilities reported early term births above the expected levels (Field, 2009). The lowest proportion of early term birth (22 percent) was found at Hospital A. The highest proportion of early term delivery occurred at Hospital O where 47.9 percent of their deliveries within the EGA range of 37-41 transpired between 37-38 weeks.

*Hypothesis Two: Among county hospitals there are different rates of early term births preceded by elective induction.* The anticipated proportion of early term deliveries to full term deliveries preceded by elective induction was ET 27.6: FT 72.4. Significant differences were demonstrated by nine of the study hospitals  $X^2(15, n=14,060) = 541.756, p < .001$ , two-tailed. Cramer's  $V = .196$  denoted a small effect size. Standardized residuals evaluated at the  $< .001$  significance level revealed that five hospitals had fewer elective early term inductions than expected. Four hospitals performed labor inductions more often than would be statistically expected. As could be anticipated based on the overall population proportion of early term births by hospital calculated for Hypothesis 1, Hospital A maintained the lowest elective induction

proportion at a mere 11.1 percent. Hospital P was associated with the highest proportion of elective induction of early term fetuses at 41.1percent.

*Hypothesis Three: Among county hospitals, there are different rates of early term births preceded by elective cesarean section.* Significant differences were detected among the study population  $\chi^2 (15, n=4125) = 74.804, p < .001$ , two-tailed. Cramer's  $V = .135$  showed a small effect size. Residuals evaluated for significance at the  $p < .001$  level, indicated that three of the hospitals performed cesareans sections outside of the expected range. Only one site, Hospital L, had lower than expected proportions of early term deliveries preceded by elective cesarean section. The data reported that two facilities, Hospital O at 53 percent and Hospital E at 65.2 percent perform cesareans on early term fetuses at a higher rate than their peer institutions.

*Hypothesis Four: Among county hospitals there are different rates of Neonatal Intensive Care Unit admissions of electively delivered early term neonates.* This hypothesis was examined for the elective induction and the elective cesarean cohorts separately. Chi Square analysis did not produce statistical significance for either NICU admission following elective induction  $\chi^2 (14, n=350) = 20.268, p = .122$ , or NICU admission following elective cesarean,  $\chi^2 (9,185) = 7.721, p = .563$ .

Table 4: Early Term (ET) versus Full Term (FT) Births 2008 –2009 by Elective Procedure and Associated Outcome

	Total births		Inductions without risk		NICU following induction without risk		Cesareans without risk		NICU following cesarean without risk	
	ET	FT	ET	FT	ET	FT	ET	FT	ET	FT
Hospital A										
Count	160	568	20	160	0	2	16	40	0	0
% Within hospital	22.0	78.0	11.1	88.9	-	100.0	28.6	71.4	-	-
Hospital B										
Count	85	143	21	48	0	2	6	9	0	0
% Within hospital	37.3	62.7	30.4	69.6	-	100.0	40.0	60.0	-	-
Hospital C										
Count	1,362	1,766	248	687	9	17	4	7	0	0
% Within hospital	43.5	56.5	26.5	73.5	34.6	65.4	36.4	63.6	-	-
Hospital D										
Count	2,134	4079	324	723	16	26	94	131	7	9
% Within hospital	34.3	65.7	30.9	69.1	38.1	61.9	41.8	58.2	43.8	56.3

continued on next page







## Discussion

### Hypothesis One

Early term births comprised 30.7 percent of the complete 2008-2009 data set for the county. This is approximately three percent higher than the national average of 27.7 for the same years (Martin et al., 2011). When viewed solely as a proportion of singleton births without congenital anomalies from the 37-41 week gestation population, the percent rose to 34.6 early term infants. (Table 4) These early term births which appear to occur for reasons outside of medical indications have been referred to as “iatrogenic” deliveries (Murthy, Grobman, Lee, & Hall, 2011).

The wide variance of the proportion of early term births to full term births by hospital of 22 percent to 47.9 percent suggests that a variety of practice patterns are involved. These disparate findings provide evidence of the unique *system* component in the Quality Health Outcomes Model. Teaching institutions were represented in both the above and below the expected norm category for early term births. Neither did profit status appear to produce an impact on early term birth rates. Even hospitals within the county that function under the same corporate umbrella reported significant differences in the occurrence of early term birth.

### Hypothesis Two

Elective induction of labor has been frequently cited as an antecedent to iatrogenic early term birth (Murthy et al., 2011; Ohnsorg & Schiff, 2010; Oshiro et al., 2009). In 2009 the national average for induction of labor was 23.2 percent (Martin et al., 2011); for the two years from 2008-2009 the rate of induction for the study group (37-41 weeks gestation) averaged 23 percent, mirroring the national average. Of the 17,520

inductions that occurred within the study population, 14, 060 of those lacked documentation of medical indication; early term infants comprised more than 27 percent of the induced without medical indication cohort. Even if Bailit's (2010) warning is accurate that birth certificates inflate numbers of elective induction by eleven percent, over 12,500 neonates from the study group were potentially induced without cause.

Significant differences between hospitals for the proportions of early term births preceded by elective induction indicate a connection between practice patterns and interventions. According to Murthy et al., (2011) the rising rates of electively induced early term births are disproportionate to the degree of change that could be logically associated with "... changes in medical practice such as improved dating by ultrasound or a rise in the severity of illness in the gravid population, both suggest that non-medical factors are present and influential " (p.435.e5). The three hospitals with the largest numbers of deliveries all performed less elective inductions of early term infants than the amount expected to be demonstrated by individual hospitals. This could possibly be attributed to the large number of providers on staff at these facilities contributing to the heterogeneity of provider practice patterns. Profit status, teaching status, and corporate affiliation did not demonstrate effects on rates of elective induction of early term infants.

### **Hypothesis Three**

Besides elective induction of labor, elective cesarean delivery is the intervention most frequently associated with iatrogenic early term birth. The 2009 Cesarean rate according to the National Center for Vital Statistics was 32.3 percent (Martin et al., 2011); the study county reported a 29.1 percent average cesarean rate for the two years 2008-2009. The 37-41 week study cohort contained 4,125 cases of cesareans performed

without indicated risk. In retrospect, the operational definition of cesarean risk in this study was extremely conservative and likely served to underestimate the frequency of surgical birth done without indication. Inductions and cesareans were conceptualized as mutually exclusive, despite the evidence that labor induction significantly heightens the risk of cesarean delivery (Ehrenthal, Jiang, & Strobino 2010; Wilson, Effken, & Butler, 2010). Yet no case that began as an induction without risk, even if it ultimately ended in cesarean birth without risk, was included. If these cases had been included, the cesarean without indicated risk population would have potentially grown 17 percent to 4,988 cases. Another factor that lessened the size of the cesarean without risk group was the decision by the researchers to exclude cases of mothers who had prior cesareans. This eliminated the confounding, often contentious topic of the safety of vaginal birth after cesarean. Subsequently over 9,497 cases were eliminated from the study population before any other risks were evaluated. Of that eliminated group repeat cesareans resulted in 4,017 early term births. Despite the conservative definition of risk, women in the low risk population for cesareans experienced differing rates of operative birth across study hospitals. Although statistical differences did exist between the hospitals' rates of early term infants born by elective cesarean, the similarities are also worth noting. With only three hospitals as outliers from the group, the mean rate of early term infants born surgically without apparent indication for 13 of the 16 hospitals in the county was 40.3 percent with a standard deviation of 5.75. This finding alone warrants further investigation.

## **Hypothesis Four**

The two individual cohorts of mothers induced without risk and those delivered by cesarean without risk were examined for frequency of admission of their newborns to NICUs across hospitals. No statistical difference between study hospitals was noted. The researchers contend that the number of infants in these two samples was again underestimated related to the conservative approach to risk utilized. However, in analysis of the sheer numbers of infants considered for this hypothesis, it seems fitting to explore the proportion of NICU admissions for early versus full-term births. Although the numbers are conservative based on the aforementioned risk exclusion, we are left with several thousand potential NICU admissions (Table 5). Percentages then, of early- and full-term births who experience a NICU admission suggest a trend where the early-term infants more frequently experience NICU admissions than the full-term infants. Figure 2 below depicts the differences in percentages of early term versus full term infants admitted to the NICU following elective delivery. For both elective induction and cesarean the proportion of infants admitted to the NICU was higher for the early term cohort. Despite the absence of statistical significance of differences in NICU admissions across hospitals, the human and fiscal significance of iatrogenic illness resulting from elective delivery is worthy of consideration. In Texas, maternal-fetal stakeholders have noted the consequences of interventive birth. The Healthy Texas Baby Initiative was launched in 2011 as an effort to decrease perinatal health care costs and improve neonatal outcomes. Eliminating elective birth before 39 weeks has been identified as a key factor in achieving this important goal (Healthy Texas Babies, 2012).

Table 5: NICU Admission by Birth Type

Gestational Cohort and Birth Type	Total	NICU Admissions
ET Induction Without Apparent Indication	3777	120
FT Induction Without Apparent Indication	9951	230
ET Cesarean Without Apparent Indication	1491	88
FT Cesarean Without Apparent Indication	2449	97

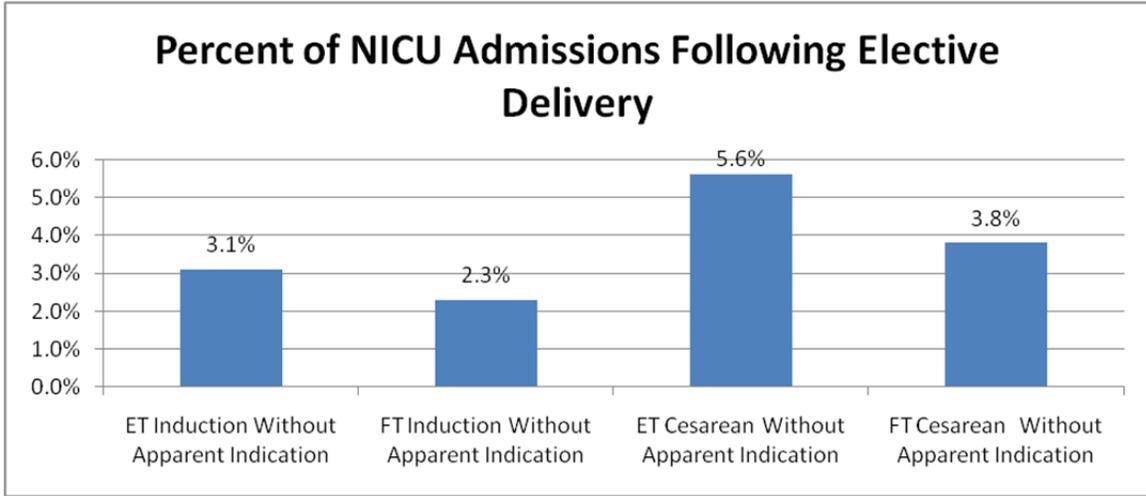


Figure 2. Percent of NICU Admissions Following Elective Delivery

### Conclusion

This secondary data analysis supports the Quality Health Outcomes Model. With the exception of *interventions* and *outcomes*, each component of the model has a reciprocal effect on every other component. The dynamic nature of this model suggests that *interventions* do not directly produce *outcomes* in isolation. Instead *interventions* have reciprocal influence on the *system*. For example, within those hospitals that have an unquestioned practice of performing inductions and cesareans without medical indication, a culture of acceptance for elective birth can occur, thus creating *system* norms. *Interventions* also impact the individual through whom *outcomes* are manifested. These

*outcomes* in turn, participate in the feedback loop, influencing both *clients* and the *system*.

Marked differences between hospitals in the study county related to elective delivery of early term infants provide insight into current obstetrical *system* specific trends. Although practice patterns alone are not responsible for the occurrence and outcome of early term birth, they arguably play a significant role. Future strategies to reduce early term birth will be aimed at the *system* (clinicians and hospitals) through collaboration with the state and the March of Dimes. Efforts to change practice patterns will be guided by the belief that health care providers and hospitals are professionally obligated to provide the safest care possible. Programs that foster clinician understanding of the ramifications of elective inductions and elective cesarean deliveries should be developed.

Future educational strategies will also target the *client* to insure that mothers recognize the relationship between elective deliveries and early term infants. Increasing women's knowledge about the dangers of early term birth should, according the QHOM, impact every component of the model. Ideally clients will begin to refuse provider offers for early term delivery (*interventions*: elective induction and cesarean); *client* requests for such *interventions* should diminish as well; the *system* will respond with a decrease in offers for such procedures. The ultimate *outcome* will be to minimize the number of early term infants, a positive result which should further influence both *systems* and *clients* independently and reciprocally to perpetually pursue optimal gestational length for all healthy fetuses.

## References

- Abe, K., Shapiro-Mendoza, C.K., Hall, L., & Satten, G. (2010). Late preterm birth and risk of developing asthma. *The Journal of Pediatrics*, 157(1), 74-78.
- Adams-Chapman, I. (2009). Insults to the developing brain and impact on neuro-developmental outcome. *Journal of Communication Disorders*, 42, 256-262.
- American Congress of Obstetricians & Gynecologists. (2009). Practice Bulletin No. 107: Induction of labor. *Obstetrics and Gynecology*, 114 (2 Part 1), 386-397.
- Ananth, C.V. (2005). Perinatal epidemiologic research with vital statistics data: Validity is the essential quality. *American Journal of Obstetrics and Gynecology*, 193(1), 5-6.
- Ananth, C.V. (2007). Menstrual vs. clinical estimate of gestational age dating in the United States: temporal trends and variability in indices of perinatal outcomes. *Paediatric and Perinatal Epidemiology*, 21(Suppl. 2), 22-30.
- Bailit, J. L. for the Ohio Perinatal Quality Collaborative. (2010). Rates of labor induction without medical indications are overestimated when derived from birth certificate data. *American Journal of Obstetrics and Gynecology*, 203, 269e1-3.
- Bakewell-Sachs, S. (2007). Near-term/Late preterm infants. *Newborn & Infant Nursing Reviews*, 7(2), 67-71.
- Bird, T.M., Bronstein, J. M., Hall, R.W., Lowery, C.L., Nugent, R., & Mays, G. P. (2010). Late preterm infants: Birth outcomes and health care utilization in the first year. *Pediatrics*, 126, e311-e319.
- Cherniak, D. & Fisher, J. (2008). Explaining obstetric interventionism. *Women's Studies International Forum*, 31, 270-277.
- Clark, S.L., Miller, D.D., Belfort, M., Dildy, G. Frye, D., & Meyers, J. (2008). Neonatal and maternal outcomes associated with elective term delivery. *American Journal of Obstetrics and Gynecology*, 200(2), 156e.1-156e.4.
- Damus, K. (2008). Prevention of preterm birth: a renewed national priority. *Current Opinion in Obstetrics and Gynecology*, 20, 590-596.

- Davidoff, M.J., Dias, T., Damus, K., Russell, R., Bettgowda, V.R., Dolan, S.,...Petri, J.(2006). Changes in the gestational age distribution among U.S. singleton births: Impact on rates of late preterm birth, 1992 to 2002. *Seminars in Perinatology*, 30 (1), 8-15.
- Donabedian, A. (1966). Evaluating the quality of medical care. *Milbank Memorial Fund Quarterly*, 44 (part 2), 166-206.
- Engle, W. A. & Kominiarek, M.A. (2008). Late preterm infants, early term infants, and timing of elective deliveries. *Clinics in Perinatology*, 35, 325-341.
- Epstein, A.J. & Nicholson, S. (2009). The formation and evolution of physician treatment styles: An application to cesarean sections. *Journal of Health Economics*, 28, 1126-1140.
- Erenthal, D.B., Jiang, X., Strobino, D.M. (2010). Labor induction and the risk of a cesarean delivery among nulliparous women at term. *Obstetrics & Gynecology*, 116(1), 4-6.
- Field, A. (2009). *Discovering statistics using SPSS (3<sup>rd</sup> ed.)*. Los Angeles: Sage.
- Fleischman, A. R., Oinuma, M., & Clark, S. L. (2010). Rethinking the definition of “term pregnancy”, *Obstetrics and Gynecology*, 116(1), 136-139.
- Gouyon, J.B., Vintejoux, A., Sagot, P., Burguet, A., Quantin, C., Ferdynus, C. (2010). Neonatal outcome associated with singleton birth at 34-41 weeks of gestation. *International Journal Epidemiology*, 39(3), 769-776.
- Healthy Texas Babies. (2012). Retrieved April 12, 2012 from <http://www.dshs.state.tx.us.healthtexasbabies/initiatives.aspx>
- Howsen, C., Merialdi, M., Lawn, J., Requejo, J., & Say, L. (Eds.). (2009). *March of Dimes White Paper on Preterm Birth: The Global and Regional Toll*. Retrieved from [http://www.marchofdimes.com/downloads/WhitePaper66423\\_MOD-Complete.pdf](http://www.marchofdimes.com/downloads/WhitePaper66423_MOD-Complete.pdf)
- Hunter, L.A. (2009). Issues in pregnancy dating: Revisiting the evidence. *Journal of Midwifery & Women's Health*, 54(3), 184-190.
- Macones, G. (2010). Elective delivery before 39 weeks: A reason for caution. *American Journal of Obstetrics and Gynecology*, 202(3), 208.
- March of Dimes. (2011). *Prematurity Campaign*. Retrieved June 20, 2011 from <http://www.marchofdimes.com/mission/prematurity.html>

- Martin, J.A. (2007). United States vital statistics and the measurement of gestational age. *Paediatric and Perinatal Epidemiology*, 21 (Suppl.2), 13-21.
- Martin, J.A., Hamilton, B.E., Ventura, S.J., Osterman, M.J.K., Kirmeyer, S., Mathews, T.J., Wilson, E.C. (2011). Births: Final data for 2009. *National Vital Statistics Reports*, 60(1), 1-72.
- Mitchell, P., Ferketich, S., & Jennings, B. (1998). Quality health outcomes model. *Journal of Nursing Scholarship*, 30(1), 43-46.
- Mozurkewich, E., Chilimigras, J., Koepke, E., Keeton, K., & King, V.J. (2009). Indications for induction of labor: A best evidence review. *British Journal of Obstetrics and Gynaecology*, 116(5), 626-636.
- Murthy, K., Grobman, W.A., Lee, T.A., Holl, J.L. (2011). Trends in induction of labor at early-term gestation. *American Journal of Obstetrics and Gynecology*, 204, 435.e1-6.
- National Center for Health Statistics. (2001). Report of the panel to evaluate the U.S. standard certificates. Retrieved October 20, 2011 from [www.cdc.gov/nchs/dta/dvs/panelreport\\_acc.pdf](http://www.cdc.gov/nchs/dta/dvs/panelreport_acc.pdf)
- Northam, S., Polancich, S., & Restrepo, E. (2003). Birth certificate methods in five hospitals. *Public Health Nursing*, 20(4), 318-327.
- Ohnsorg, T. & Schiff, J. (2010). Preventing elective induction before 39 weeks. *Minnesota Medicine*, 93(11), 44-46.
- Oshiro, B.T., Henry, E., Wilson, J., Branch, D.W., & Varner, M.W. (2009). Decreasing elective Deliveries before 39 weeks of gestation in an integrated health care system. *Obstetrics & Gynecology*, 113(4), 804-811.
- Qin, C., Hsia, J., & Berg, C.J. (2008). Variation between LMP and clinical estimates of gestational age in vital records. *American Journal of Epidemiology*, 167, 646-652.
- Raju, T.N.K., Higgins, R.D., Stark, A.R., & Leveno, K.J. (2006). Optimizing care and outcome for late-preterm (near-term) infants: A summary of the workshop sponsored by the National Institute of Child Health and Human Development. *Pediatrics*, 118 (3), 1207-1214.
- Rebarber, A., Cleary-Goldman, J., Istwan, N., Rhea, D., Stanziano, G., & Salt, G. (2009). The association of elective cessation of tocolysis and preterm birth in singleton gestations. *American Journal of Perinatology*, 26 (5), 351-355.

- Reddy, U.M., Bettgowda, V.R., Dias, T., Yamada-Kushnir, T., Ko, Chia-Wen., & Willinger, M. (2011). Term pregnancy: A period of heterogeneous risk for infant mortality. *Obstetrics & Gynecology*, 117(6), 1279-1287.
- Reddy, U.M., Ko, C.W., & Willinger, M. (2006). 'Early term' births are associated with increased mortality. *American Journal of Obstetrics and Gynecology*, 195, S202.
- Roohan, P.J., Josberger, R.E., Acar, J., Dabir, P., Feder, H.M., & Gagliano, P.J. (2003). Validation of birth certificate data: A study of women in New York State. *Journal of Community Health*, 28, 335-346.
- Schoendorf, K.C. & Branum, A.M. (2005). The use of United States vital statistics in perinatal and obstetric research. *American Journal of Obstetrics and Gynecology*, 194(4), 911-915.
- Sinha, A., Bewley, S., & McIntosh, T. (2011). Myth: Babies would choose prelabour Caesarean section. *Seminars in Fetal & Neonatal Medicine*, 16, 247-243.
- Siri, M.J., & Cork, D.L. (2009). Vital statistics: Summary of a workshop. Committee on National Statistics Research Council, Retrieved October 20, 2011 from [http://books.nap.edu/catalog.php?record\\_id=12714](http://books.nap.edu/catalog.php?record_id=12714)
- Texas Department of State Health Services (TDSHS). (2009). Checklist for Birth Certificate Data 2005 and Beyond. Retrieved February 25, 2012 from <http://www.dshs.state.tx.us/topicrelatedcontent.aspx?itemsid=447>
- Texas Department of State Health Services (TDSHS). (2010). Births by public health region, county and city of residence: Texas, 2007. Retrieved from: <http://www.dshs.state.tx.us/CHS/VSTAT/latest/t09t.shtm>
- Texas Department of State Health Services (TDSHS). (2012). Applications and forms: Health facility program. Retrieved from <http://www.dshs.state.tx.us/HFP/apps.shtm>
- Texas Health Care Information Collection Center for Health Statistics: 2008-2009. (2011) [Accessed November 26, 2011]. Inpatient and outpatient data: Texas Health Care Information Collection Center for Health Statistics; Texas inpatient public use data file (PUDF) Retrieved from <http://www.dshs.state.tx.us/thcic/hospitals/HospitalData.shtm>.
- The Ohio Perinatal Quality Collaborative Writing Committee. (2010). A statewide initiative to reduce inappropriate scheduled births at 36 0/7-386/7 weeks' gestation. *American Journal of Obstetrics and Gynecology*, 202, 243e1-8.

- Varney, H., Kriebs, J.M., Geger, C.L. (2004). Management plan for normal pregnancy. In H. Varney, J.M. Kriebs, & C.L. Geger (Eds.), *Varney's Midwifery* (4<sup>th</sup> ed.). (pp. 571-618). Boston: Jones and Bartlett.
- Williamson, D.M., Abe, K., Bean, C., Ferre, C., Henderson, Z., & Lackritz, E. (2008). Report from the CDC: Current research in preterm birth. *Journal of Women's Health, 17*(10), 1545-1549.
- Wilmink, F.A., Hukkelhoven, C., Lunshof, S., Mol, B., Post, J., & Papatsonis, D. (2010). Neonatal outcome following elective cesarean section beyond 37 weeks of gestation: a 7 year retrospective analysis of a national registry. *American Journal of Obstetrics and Gynecology, 202*(3), 250.e1-250.e8.
- Wilson, B.L., Effken, J., Butler, R.J. (2010). The relationship between cesarean section and labor induction. *Journal of Nursing Scholarship, 42*(2), 130-138.

## **Chapter Four: Summary and Conclusions**

The two preceding manuscripts illustrate that the American obstetrical model is in need of substantive changes. Certainly health care providers want the best for their patients and women want the best for their babies. Still a highly interventive childbirth paradigm with less than stellar outcomes prevails. This reality suggests that significant gaps in understanding childbirth persist for both the providers and recipients of care.

The clinical case study related two sobering tales in which the clients appeared to exhibit a clearer vision for their health and well-being than did their health care providers. Extensive knowledge regarding their bodies' capacity to birth and their commitment to being engaged participants in the birth process contributed to their successful achievement of vaginal delivery. By acting on their inner wisdom these women birthed safely on their own terms and experienced what they perceive as empowering delivery experiences. In doing so, they avoided surgical birth for their initial and subsequent pregnancies.

The perspectives of these two women could be used as a launching point to design educational interventions for teenagers and young adults. Further research is needed to understand when and how young women form lasting perceptions of their ideal pregnancy and delivery. The clinical case studies also raise socio-anthropological questions regarding contemporary women's views on their bodies' ability to birth and whether or not that ability is perceived to be meaningful. Ultimately the clinical case studies point out the need for education for physicians, midwives, nurses and the

childbearing population about the need to balance the risks and benefits of obstetrical interventions.

The secondary data analysis established an epidemiological snapshot of recent obstetrical practices in one major United States county. Despite recommendations from the American Congress of Obstetricians and Gynecologists that healthy pregnancies should not be disturbed by elective inductions or cesarean section prior to 39 completed gestational weeks (2009), it appeared that many health care providers were continuing these practices. Significant differences in elective delivery practice patterns across the study population were revealed and will provide a foundation for educational efforts for health care facilities and the public. Conversations about the need to minimize the rising rates of interventive birth are not new, but the topic is gaining more attention in both the professional and public arenas as the physiological and fiscal implications become increasingly evident. The now classic study by Main (1999) submitted that “reduction of cesarean sections is less about medical education than about creating behavioral and cultural changes in physicians, nurses and patients (p. 382). Oshiro et al., (2009) deftly described the subtle circumstances in which obstetrical culture is created in the context of iatrogenic early term birth. The researchers began by explaining that the majority of deliveries at 38 weeks do not result in harm. A hypothetical physician electively delivering 10 percent of his or her 200 infants per year at early term would ultimately produce one NICU admission. Because obstetricians are not at all engaged in the care of the ill newborn, they do not assimilate the reality of their responsibility for the untoward outcome (Oshiro et al, 2009). Over time, these practice patterns infiltrate individual

provider and hospital practices and evolve into the new accepted norm for the culture of obstetrics (Oshiro et al., 2009).

### **Implications for the Future**

Government agency regulations are not so subtle drivers of cultural change in health care practice. Elective cesareans and inductions for low risk women have been identified as core measures for new national health care quality and safety priorities (The Joint Commission, 2010) These guidelines should be effective as they ultimately influence insurance reimbursement practices. Government agency regulations will begin to supersede both physician practice decisions and maternal requests for intervention. It is more than theoretically possible that the confluence of awakening of consumer awareness, maternal-fetal health outcomes research, and government policy initiatives may create a cultural tipping point that stems the tide of modern interventive birth practices. More studies such as this one in other states would be one way to make clear, at a national level, the impact of early term deliveries. I sincerely hope that my research trajectory will at least play a small role in ameliorating maternal-fetal health indices for the next generation and beyond.

## References

- American Congress of Obstetricians & Gynecologists. (2009). Practice Bulletin No. 107: Induction of labor. *Obstetrics and Gynecology*, 114 (2 Part 1), 386-397.
- Berns, S. D. (2009). March of Dimes prematurity collaborative. *Pulse*. Retrieved February 26, 2012 from <http://www.amchp.org/AboutAMCHP/Newsletters/Pulse/Archive/2009/November%202009/Pages/Feature1.aspx>
- Cherniak, D. & Fisher, J. (2008). Explaining obstetric interventionism. *Women's Studies International Forum*, 31, 270-277.
- Fleischman, A. R., Oinuma, M., & Clark, S. L. (2010). Rethinking the definition of “term pregnancy”, *Obstetrics and Gynecology*, 116(1), 136-139.
- Gladwell, M. (2000). The tipping point. How little things can make a big difference. New York: Little, Brown and Company.
- Infant Mortality Rate. (2012). In Central Intelligence Agency World Factbook. Retrieved February 25, 2012 from <http://www.cia.gov/library/publications/the-world-factbook/rankorder/2091rank.html>
- MacDorman, M., Declercq, E., Menacker, F. (2011). Recent trends and patterns in cesarean and vaginal birth after cesarean (VBAC) deliveries in the United States. *Clinics in Perinatology*, 38(2), 179-192.
- Main, E. (1999). Reducing cesarean birth rates with data-driven quality improvement activities. *Pediatrics*, 103(1), 374-383.
- March of Dimes. (2011). Less than 39 weeks toolkit. Retrieved May 8, 2011 from [http://www.marchofdimes.com/professionals/medicalresources\\_39weeks.html](http://www.marchofdimes.com/professionals/medicalresources_39weeks.html)
- Maternal Mortality Rate. (2012). In Central Intelligence Agency World Factbook. Retrieved February 25, 2012 from <http://www.cia.gov/library/publications/the-world-factbook/rankorder/2223rank.html>
- Oshiro, B.T., Henry, E., Wilson, J., Branch, D.W., & Varner, M.W. (2009). Decreasing elective Deliveries before 39 weeks of gestation in an integrated health care system. *Obstetrics & Gynecology*, 113(4), 804-811.

The Joint Commission (TJC). (2010). Specifications manual for joint commission national quality core measures. Retrieved on February 2, 2012  
<http://manual.jointcommission.org/releases/TJC2010A/MIF0166.html>

Vanderweele, T.J., Lantos, J.D., Lauderdale, D.S. (2011). Rising preterm birth rates, 1989-2004: Changing demographics or changing obstetric practice. *Social Science & Medicine*, 74(2), 196-201

Zhang, J., Troendle, J., Reddy, M. et al. for the Consortium of Safe Labor. (2010). Contemporary cesarean delivery practice in the United States. *American Journal of Obstetrics and Gynecology*, 203(326), p. e1-10.

## Appendix A: Case Study IRB Approval

The University of Texas at Tyler  
Institutional Review Board

July 25, 2011

Dear Ms. McAlister:

Your request to conduct the study entitled *Exploring the Inner Wisdom in the Pregnant Client: A Case Study Approach* is approved as an expedited study, IRB #SUM2011-82 by The University of Texas at Tyler Institutional Review Board. This approval includes the waiver of the written informed consent. Please ensure that any research assistants or co-investigators have completed human protection training, and have forwarded their certificates to the IRB office (G. Duke).

**Please review the UT Tyler IRB Principal Investigator Responsibilities, and acknowledge your understanding of these responsibilities and the following through return of this email to the IRB Chair within one week after receipt of this approval letter:**

- This approval is for one year, as of the date of the approval letter.
- Request for Continuing Review must be completed for projects extending past one year
- Prompt reporting to the UT Tyler IRB of any proposed changes to this research activity
- Prompt reporting to the UT Tyler IRB and academic department administration will be done of any unanticipated problems involving risks to subjects or others
- Suspension or termination of approval may be done if there is evidence of any serious or continuing noncompliance with Federal Regulations or any aberrations in original proposal.
- Any change in proposal procedures must be promptly reported to the IRB prior to implementing any changes except when necessary to eliminate apparent immediate hazards to the subject.

Best of luck in your research, and do not hesitate to contact me if you need any further assistance.

Sincerely,



Gloria Duke, PhD, RN  
Chair, UT Tyler IRB

## Appendix B: Informed Consent

### THE UNIVERSITY OF TEXAS AT TYLER

#### Informed Consent to Participate in Research

**Institutional Review Board # SUM2011-82**

**Approval Date: July 25, 2011**

- 1. Project Title:** *Exploring the Inner Wisdom in the Pregnant Client: A Case Study Approach*
- 2. Principal Investigator:** Barbara S. McAlister
- 3. Participant's Name:**

#### **To the Participant:**

You are being asked to take part in this study at The University of Texas at Tyler (UT Tyler). This consent form explains why this research study is being performed and what your role will be if you choose to participate. This form also describes the possible risks connected with being in this study. After reviewing this information with the person responsible for your enrollment, you should be able to understand and make an informed decision on whether you want to take part in this study.

- 4. Description Of Project** *To gain an in-depth understanding of the experience of two women, who following their original health care providers' antepartum recommendations for Cesarean delivery, found the courage to seek new health care provider support for their desire to attempt vaginal birth.*

#### **5. Research Procedures**

If you agree to be in this study, we will ask you to do the following things:

1. Discuss the story of your pregnancy, childbirth and early postpartum period with the principal investigator. This interview will be audio-taped and notes will be taken.
2. Permit the principal investigator to view and document personal health information from your birth center chart.
3. Allow the principal investigator to contact you again with additional questions that would help investigator to better understand your story.

#### **6. Side Effects/Risks**

*Participant may become slightly distressed as she recalls her experiences of seeking preferred method of childbirth.*

Appendix B (Continued)

**7. Potential Benefits**

*Heightens awareness of the need to educate and to empower women to be responsible for their own health and well-being.*

**Understanding Of Participants**

**8.** I have been given an opportunity to ask any questions concerning this research study and the researcher has been willing to answer my questions.

**9.** If I sign this consent form I know it means that:

- I am taking part in this study because I want to. I chose to take part in this study after having been told about the study and how it will affect me.
- I know that I am free to not participate in this study and that if I choose to not participate, then nothing will happen to me as a consequence.
- I know that I have been told that if I choose to participate, then I can stop being a part of this study at any time. I know that if I do stop being a part of the study, then nothing will happen to me.
- I will be told about any new information that may affect my willingness to continue participating in this study.
- The study may be changed or stopped at any time by the researcher or by The University of Texas at Tyler.
- The researcher will gain my written consent for any changes that may affect me.

**10.** I have been assured that that my name will not be revealed in any reports or publications resulting from this study without my expressed written consent.

**11.** I also understand that any information collected during this study, including any health-related information, may be shared with the following as long as no identifying information as to my name, address, or other contact information is provided):

- Organization contributing money to be able to conduct this study
- Other researchers interested in combining your information with information from other studies
- Information shared through presentations or publications

Appendix B (Continued)

- 12. I understand The UT Tyler Institutional Review Board (the group that ensures that research is done correctly and that measures are in place to protect the safety of research participants) may review documents that have my identifying information on them as part of their compliance and monitoring process. I also understand that any personal information revealed during this process will be kept strictly confidential.
- 13. I have been told of and I understand any possible expected risks that are associated with my participation in this research project.
- 14. I also understand that I will not be compensated for any patents or discoveries that may result from my participation in this research.
- 15. If I have any questions concerning my participation in this project, I shall contact the principal researcher: Barbara McAlister 214.240.3035 Bmcalister2@patriots.uttyler.edu
- 17. If I have any questions concerning my rights as a research subject, I shall contact Dr. Gloria Duke, Chair of the IRB, at (903) 566-7023, [gduke@uttyler.edu](mailto:gduke@uttyler.edu), or the University's Office of Sponsored Research:

The University of Texas at Tyler  
c/o Office of Sponsored Research  
3900 University Blvd.  
Tyler, TX 75799

I understand that I may contact Dr. Duke with questions about research-related injuries.

18. **CONSENT/PERMISSION FOR PARTICIPATION IN THIS RESEARCH STUDY**

Based upon the above, I consent to taking part in this study as it is described to me. I give the study researcher permission to enroll me in this study. I have received a signed copy of this consent form.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness to Signature

Appendix B (Continued)

19. I have discussed this project with the participant, using language that is understandable and appropriate. I believe that I have fully informed this participant of the nature of this study and its possible benefits and risks. I believe the participant understood this explanation.

---

**Researcher/Principal Investigator**

**Date**

**Appendix C: IRB for Protected Health Information Use**

**THE UNIVERSITY OF TEXAS AT TYLER  
INSTITUTIONAL REVIEW BOARD**

**APPLICATION FOR PROTECTED HEALTH INFORMATION USE**

**IRB#** Sum2011-82  
**Approved:** July 25, 2011

**Principal Investigator:** Barbara S. McAlister  
**Email address:** bmcAlister2@patriots.uttyler.edu  
**Phone number:** 2142403035

**Research Staff needing access to protected health information (must also be listed in IRB review application):**

Barbara S. McAlister, principal investigator  
Sally Northam, RN, PhD, doctoral advisor

**Study Title:** *Exploring the Inner Wisdom in the Pregnant Client: As Case Study Approach*

*TYPE OF HEALTH INFORMATION REQUESTED*

**Which of the following categories of health information is being requested for use in this study (check all that apply)**

**Category 1:  Health information that is protected, with authorization from participants**

Health information, as defined by the HIPAA Privacy Act can be protected or it can be de-identified. Protected health information (PHI) includes the following:

"...as individually identifiable health information, held or maintained by a covered entity or its business associates acting for the covered entity, that is transmitted or maintained in any form or medium (including the individually identifiable health information of non-U.S. citizens). This includes identifiable demographic and other information relating to the past, present, or future physical or mental health or condition of an individual, or the provision or payment of health care to an individual that is created or received by a health care provider, health plan, employer, or health care clearinghouse. For purposes of the Privacy Rule, genetic information is considered to be health information."

[[http://privacyruleandresearch.nih.gov/pr\\_07.asp](http://privacyruleandresearch.nih.gov/pr_07.asp)]

## Appendix C (Continued)

### **Category 2: \_\_\_ Health information that is a limited data set**

Limited data sets include that all identifiers have been removed except:

- Admission, discharge, or service dates
- Dates of birth, death
- Age (including age 90 or over)
- Five-digit zip code or any other geographic subdivision, such as state, county, city, precinct and their equivalent geocodes (except street address).

Refer to the IRB Handbook for additional information on limited data sets and required information from covered entities.

### **Category 3: \_\_\_ Health Information that is de-identified, none of the identifiers will be linked to the health information.**

De-Identified Health Information: Health information that cannot be linked to an individual and has none of the following identifiers with it:

- Names
- All geographic subdivisions smaller than a state, including street address, city, county, precinct, zip code and their equivalent geocodes
- All elements of dates (except year) for dates directly related to an individual, including birth date, admission date, discharge date, date of death
- Telephone numbers
- Fax numbers
- Electronic mail addresses
- Social security numbers
- Medical record numbers
- Health plan beneficiary numbers
- Account numbers
- Certificate/license numbers
- Vehicle identifiers & serial number, including license plate numbers
- Device identifiers & serial numbers
- Web universal resource locators (URLs)
- Internet protocol (IP) address numbers
- Biometric identifiers, including finger and voice prints
- Full face photographic images and any comparable images
- Any other unique identifying number, characteristic or code.

Any code used to link de-identified data to identifiers must be held by the investigator in a secure manner. The code must not be derived from or related to information about the individual, and may not be otherwise capable of being translated so as to identify the

## Appendix C (Continued)

research subject. The mechanism for re-identification must not be disclosed to any person outside of UT Tyler or the research setting.

### DATA AND/OR RECORDS NEEDED FOR RESEARCH PROTOCOL

1. Selection Criteria (e.g.: all hypertensive children seen in Pediatric Clinic)

Client records of two pre-identified participants whose pregnancy and birth stories embody the case being explored.

2. Dates of required records: from \_\_\_/\_\_\_/\_\_\_ through \_\_\_/\_\_\_/\_\_\_

For each client the dates will be different. Data will be collected beginning with the individual's first prenatal visit and end with the clients post-partum visit.

3. Data fields required (list fields required from an electronic data base, or list fields to be recorded from the paper record by the researcher):

*Height*

*Weight (entry into care)*

*Weight (preceding delivery)*

*Medical History*

*Obstetrical History*

*Pregnancy Complications*

*Blood pressure 36 wks.*

*Blood pressure @ term*

*Onset of Labor*

*Rupture of membranes*

*Blood pressure: labor*

*FHTs: Labor*

*Pain relief: Pharmacological*

*Pain relief:*

*Non-Pharmacological*

*Length of Stage One*

*Length of Stage Two*

*Length of Stage Three*

*Estimated Blood Loss*

*Perineal Integrity*

*Postpartum Complications*

*Apgars @ 1 & 5 minutes*

*Newborn Weight*

*Newborn Complications*

*Hours till discharge*

*Maternal/Fetal complications first 6 weeks after delivery*

Appendix C (Continued)

Anticipated sources of information (check all that apply)

- Paper medical records
- Electronic files
- Other: audio-taped interview

5. I certify that the use or disclosure of protected health information involves no more than minimal risk to the privacy of individuals based on at least the following elements:

a. An adequate plan is in place to protect the identifiers from improper use and disclosure. The plan is as follows (select all that apply):

All electronic study data will be password protected

Passwords will be changed on a regular basis

Access to study data will be restricted to the following authorized personnel only:

All paper study records will be kept in locked file cabinets and access limited to authorized study personnel only.

Other:

b. An adequate plan is in place to destroy the identifiers at the earliest opportunity consistent with conduct of the research, unless there is a health or research justification for retaining the identifiers or such retention is otherwise required by law.

The plan is as follows: Given the limited number of clients included in the case study, it will be quite feasible from the outset of the data collection to merely code all acquired data. At the conclusion of the study, digital recordings of the interviews will be deleted. Field notes and personal health information in written form will be shred in the home of the principal investigator.

**By submitting this form with the IRB research review application, the PI attests to the following:**

I declare that the requested information constitutes the minimum necessary data to accomplish the goals of the research.

I agree that the protected health information that I am requesting will remain secure and will be accessible only to authorized persons for all categories, and will remain de-identified for Category 3 information.

I attest that the above statements are correct and complete to the best of my knowledge.

**SIGNATURE OF PRINCIPAL INVESTIGATOR:**

Barbara S. McAlister

Principal Investigator Signature

(Acceptable signatures: Electronic submission from PIs mailbox or electronic signature)

7/25/11 \_\_\_\_\_

Date

## Appendix D: Secondary Analysis IRB Approval

The University of Texas at Tyler  
Institutional Review Board

July 8, 2011

Dear Ms. McAlister:

Your request to conduct the study entitled *Exploring the Rates and Antecedents of Early Term Birth in Dallas County, Texas: A Retrospective Study* is approved as an expedited study, IRB #SUM2011-74 by The University of Texas at Tyler Institutional Review Board. This approval includes the waiver of the written informed consent. Please ensure that any research assistants or co-investigators have completed human protection training, and have forwarded their certificates to the IRB office (G. Duke).

**Please review the UT Tyler IRB Principal Investigator Responsibilities, and acknowledge your understanding of these responsibilities and the following through return of this email to the IRB Chair within one week after receipt of this approval letter:**

- This approval is for one year, as of the date of the approval letter.
- Request for Continuing Review must be completed for projects extending past one year
- Prompt reporting to the UT Tyler IRB of any proposed changes to this research activity
- Prompt reporting to the UT Tyler IRB and academic department administration will be done of any unanticipated problems involving risks to subjects or others
- Suspension or termination of approval may be done if there is evidence of any serious or continuing noncompliance with Federal Regulations or any aberrations in original proposal.
- Any change in proposal procedures must be promptly reported to the IRB prior to implementing any changes except when necessary to eliminate apparent immediate hazards to the subject.

Best of luck in your research, and do not hesitate to contact me if you need any further assistance.

Sincerely,



Gloria Duke, PhD, RN  
Chair, UT Tyler IRB

**Appendix E: IRB for Department of State Health Services**



**TEXAS DEPARTMENT OF STATE HEALTH SERVICES**

P.O. Box 149347  
Austin, Texas 78714-9347  
1-888-963-7111  
TTY: 1-800-735-2989  
www.dshs.state.tx.us

DAVID L. LAKEY, M.D.  
COMMISSIONER

August 24, 2011

Barbara McAlister  
University of Texas at Tyler  
813 Northlake Drive  
Richardson, Texas 75080 -5006

Review Exemption: Exploring Rates and Antecedents of Early Term Birth in Dallas County, Texas: A Retrospective Study, IRB# 11-055

Dear Ms. McAlister:

Upon review of your response to our stipulations, the IRB determined that you met the stipulations, and, therefore, the IRB approved the above-referenced human subject research from 8/24/2011. In addition, the IRB determined that the research could be exempted from future IRB review based on the Code of Federal Regulations 45 CFR 46.101 (b)(4).

Further review of this study by the IRB is not required unless the protocol changes *in the use of human subjects*. In that case, the study must be resubmitted to this IRB for review. Please let this IRB know when the research project is completed by filling out and submitting a Final Report upon Termination of Project form, which you can find on our website.

If you have any questions, please contact the IRB Administrator, Steven Lowenstein at (512) 458-7111, extension 2202, or toll-free at 1-888-777-5037, or e-mail at [steven.lowenstein@dshs.state.tx.us](mailto:steven.lowenstein@dshs.state.tx.us). You may also visit our website at [www.dshs.state.tx.us/irb](http://www.dshs.state.tx.us/irb).

Sincerely,

A handwritten signature in black ink, appearing to read "John F. Villanacci".

John F. Villanacci, Ph.D., NREMTI  
Chair, DSHS Institutional Review Board #1  
00008616/IRB00004733

:sl.

cc: file (11-055)

## Appendix G: Biographical Sketch

Biographical Sketch			
NAME Barbara Shippey McAlister		POSITION TITLE Doctoral Candidate, University of Texas at Tyler	
eRA COMMONS USER NAME (credential, e.g., agency login) N/A		Associate Clinical Professor of Nursing, Texas Woman's University	
EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
University of Texas at Houston	BSN	05/84	Nursing
Texas Woman's University	MS	05/97	Nursing
University of Texas at Tyler	PhD	05/12	Nursing

### *A. Personal Statement*

The goal of the proposed research is to investigate the impact of health care provider practice patterns on obstetrical outcomes. Specifically, I plan a layered approach to the research which will utilize both qualitative inquiry and secondary data analysis. I have the clinical expertise, academic preparation, and commitment necessary to successfully carry out the proposed work. My fifteen years of experience as a Certified Midwife along with a decade of service in Academia have fueled my passion for working within health care facilities, universities and the community to improve maternal-fetal outcomes. The education I have received as a doctoral student at University of Texas at Tyler, has established a foundation upon which I can build my research trajectory. My immediate plans are to collaborate with my doctoral advisor, the March of Dimes and the Texas State Department of Health Services to share the outcomes of this research. The results should serve to illustrate the wide variations in obstetrical practice patterns across hospitals in our community. Additionally the results of this study will serve as a point of comparative reference to assess the degree of change accomplished by recent initiatives to decrease the widespread use of obstetrical interventions without medical indication.

Appendix G (Continued)

*B. Positions and Honors*

**Positions and Employment**

2001 - Associate Clinical Professor of Nursing, Texas Woman's  
University  
2004-2007 Certified Nurse Midwife, Allen Birthing Center, TX  
1996-2004 Certified Nurse Midwife, Parkland Hospital, TX

**Other Experience and Professional Memberships**

1996- Member, American College of Nurse-Midwives  
2010- Member, Sigma Theta Tau

**Honors**

2005 Outstanding Perinatal Nurse of the Year for the State of Texas,  
March of Dimes