LISTENING TO THE VOICES:

A QUALITATIVE STUDY TO EXAMINE THE ATTITUDES OF WOMEN RELATED TO THE ROUTINE USE OF ULTRASONOGRAPHY IN PREGNANCY

by

Barbara Jean Lewthwaite

A Thesis presented to the Faculty of Graduate Studies
In partial fulfillment of the requirements
For the degree of

MASTER OF NURSING

Faculty of Nursing
University of Manitoba
Winnipeg, Manitoba

THE UNIVERSITY OF MANITOBA

FACULTY OF GRADUATE STUDIES

*****

COPYRIGHT PERMISSION PAGE

Listening to the Voices: A Qualitative Study to Examine the Attitudes of Women Related to the Routine Use of Ultrasonography in Pregnancy

BY

Barbara Jean Lewthwaite

A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF NURSING

I hereby declare that I am the sole author of this thesis.

I authorize the University of Manitoba to lend this thesis to other institutions for the purpose of scholarly research.

Barbara Jean Lewthwaite

I further authorize the University of Manitoba to reproduce this thesis by photocopying or by other meanss, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

Barbara Jean Lewthwaite

ABSTRACT

The routine use and growing dependence on sophisticated technology has continued to foster a medicalized approach to childbirth. Sonography or ultrasound is one of the most utilized forms of modern reproductive technology. When applied in obstetrics for specific clinical concerns, sonography provides valuable diagnostic information, however, there is limited evidence to support improved outcomes from the use of this technology as a "routine" prenatal screening test. The purpose of this study was to ask pregnant women about their attitudes toward prenatal sonography. A convenience sample of 20 women, who had undergone a prenatal scan, participated in a tape-recorded interview. Using a qualitative research method, guided by a feminist framework, five themes emerged from analysis of the narratives. These themes were: a) "In Anticipation;" b) "The Imaging Experience;" c) "The Importance of Knowing;" d) "The Next Time;" and e) "The Ethics of It All." Key findings of this study suggest women: a) want prenatal sonography; b) are fostered to believe there is a "need" for this type of testing; c) feel a prenatal scan will provide reassurance about the progress of their pregnancy; d) feel an ultrasound is a "routine" prenatal test; e) do not view sonography as a method of prenatal diagnosis; f) want information on prenatal sonography to read prior to a scan; and g) believe ultrasound to be safe technology. These findings are felt to result from the conceptualization of need, routinization of testing and the therapeutic imperative, all of which contribute further to the medicalization of childbirth. Implications for health care practice and recommendations for further research have been suggested on the basis of these findings. Hopefully, this information may assist policy makers in designing "women" sensitive health care practice.

ACKNOWLEDGMENTS

An undertaking of this nature is never accomplished in isolation. There are many individuals, past and present, who have contributed to what I lay claim as a personal achievement. This thesis is dedicated to my parents, Jim and Grace Lewthwaite, who so lovingly provided me vision and resources to seek out and value the process of learning. They were ideal role models for me and my sisters, Joan and Elizabeth. My parents were proud of their daughters as we were of them. While neither of my parents is here to witness this achievement, I know they would be proud.

I am privileged in so many ways. It is, however, with sincere appreciation and gratitude that I acknowledge the following individuals for their assistance, guidance and encouragement as I journeyed through the ups and downs of my graduate program.

I would like to say a special thank you to the 22 women (20 study and 2 pilot test) who so generously agreed to participate in this study. I thank them for their trust in me and for speaking frankly about issues they value. Hopefully their "voice" will be heard as I attempt to express their message in a variety of mediums.

I am deeply grateful to my thesis committee. I feel privileged to have worked with three stellar women and I am fortunate to call each a friend. Dr. Annette Gupton, graduate advisor and thesis chair, has been a mentor throughout my nursing and academic careers. Your guidance, encouragement and humour are indeed greatly valued. Dr. Ina Bramadat provided timely support and valued critique of this process. Dr. Sari Tudiver, the external who was internal in so many ways, your wisdom of "women's ways

of knowing" will never be forgotten. All three have nurtured my questioning ways and taught me how important the process of research is to give women the recognition they deserve. This thesis is as much yours as it is mine.

Thank you as well to Sherry and Donna for their patience while transcribing the narratives and to the sonographers who assisted with recruitment of study participants. I am indebted to Barbara Miller who so willing gave of her time and talent whenever a request was sent her way. Thank you to Marie Edwards for her "expertise" as I put the final product together. I would also like to acknowledge the monetary support I received from the Manitoba Association of Registered Nurses Foundation to conduct this research project.

Finally, to my family, friends and classmates who offered endless love, support and encouragement throughout my "many" years as a graduate student; you listened patiently, gave whenever and however you could and provided me with the special care I required to reach this goal. I will never forget your warm and thoughtful attention and I say thank you to each and every one of you.

"No country can advance unless its women advance"

Maie Casey

Table of Contents

CHAPTER ONE

Statement of the Problem

To define pregnancy and childbirth as a normal, healthy process in a woman's life takes on a controversial meaning as the twentieth century draws to a close. The transformation of these biological states into medical events deserving of sophisticated surveillance and technology has created an entity commonly referred to as "medicalized" birth (Oakley, 1993; Quéniart, 1991; Robinson, 1994). This approach to care has resulted in a medical model or pervasive medicalization of pregnancy and childbirth (Robinson, 1994; Tudiver, 1993).

The predominance of the medical model and the medicalization of birth are rooted in a number of complex trends extending over a period of time (Arney, 1982; Burst, 1983; Miles, 1991; Oakley, 1993; Wertz & Wertz, 1990). These trends have been described by Arney (1982) and can be summarized as: a) the demise of the female midwife and emergence of the "new midwifery;" b) professional organization and expanding scientific knowledge of the new midwifery (later known as obstetrics); c) control of birth by obstetricians; and d) an increasing dependence on pharmaceutical and technical innovation in the process of birth (Appendix A).

In support of these trends, medical authorities and governing bodies cite the reduction in perinatal morbidity and mortality as justification for all the changes made in obstetrical care (O'Neil & Kaufert, 1990). Pregnancy and childbirth are now viewed through a disease paradigm in which scientific knowledge is applied to assure the physical well-being

of mother and child (Robinson, 1994; Tudiver, 1993). Nevertheless, Tudiver (1993) suggests "there is considerable debate and increasing evidence to demonstrate that increased medicalization of pregnancy has not improved outcomes" (p.15).

The introduction of sophisticated health care technologies and the ever-increasing dependence on these innovations has added further to the complexity of life. Consumers and health care providers are now faced with complex issues surrounding the legal, social, ethical and economic aspects of this expanding use of technology in health care. Interestingly, the recipients or users of these sophisticated health care technologies are seldom asked for their views on how the technologies are being used, the rationale for their use, what they perceive to be the risks and benefits of the technology, and what role these technologies should play in society (Cook, 1991; Jorgensen, 1995; Lippman, 1991; Stewart, 1986; Thorpe, Harker, Pike & Marlow, 1993).

The aim of this research was to examine, from a pregnant woman's perspective, one of today's most popular technical innovations in the field of procreative medicine: dynamic real-time high resolution sonography or high-frequency sound waves pulsed into the body creating two-dimensional images of the fetus and surrounding anatomical structures. Throughout this manuscript, sonography will be synonymous with ultrasound, ultrasonography, sonogram, sonar and scan. The statement of the problem, purpose of the study and significance of the research will be addressed in this chapter.

Research Problem

Real time sonography or ultrasound is one of the most utilized forms of modern reproductive technology. In many countries of the developed world, the use of ultrasound

scanning as a means of imaging the fetus in utero is now a routine procedure during pregnancy and forms an integral part of a woman's prenatal care (Hyde, 1986; Schei, 1992; Stewart, 1986; Thorpe et al., 1993). This visual image of the fetus, by the use of ultrasound, has profoundly changed how women and their families feel about their pregnancies and has raised many questions about the extensive use of technology in all aspects of reproductive health care (Dowswell & Hewison, 1994; Gregg, 1993; Lerum & Lo Biondo-Wood, 1989; Lumley, 1990; Sandelowski, 1988; 1994; Schei, 1992; Waldenström, 1996).

While "diagnostic" ultrasound during pregnancy has proven to be beneficial to outcome or obstetrical management in situations where its use is indicated, the role of "routine" ultrasound in pregnancy (RUIP) remains controversial (Hyde, 1986; Hunter, 1991; Neilson, 1995; Salem, 1986; Schei, 1992; Stewart, 1986; Thorpe et al., 1993; Waldenström, Nilsson, Fall, Axelsson, Exlund, Lindeberg & Sjodin, 1988). The published literature indicates research has examined some of the psychosocial effects and therapeutic benefits of prenatal sonography. Those who advocate the use of prenatal ultrasound for every pregnancy claim the experience will reassure the pregnant woman about fetal well-being, will encourage women to abandon practices harmful to the fetus, facilitate early bonding (attachment) and will be an enjoyable and interesting experience (Heidrich & Cranley, 1989; Lerum & Lo Biondo-Wood, 1989; Lumley, 1990; Reading & Cox, 1982; Sandelowski, 1988, 1994; Stewart, 1986; Thorpe et al., 1993; Waldenström, 1996).

Nevertheless, several authors suggest there is limited knowledge about the attitudes and responses of women toward prenatal ultrasound and there has been even less effort

toward the incorporation of these findings into a context for women and the governing bodies, agencies and individuals involved in setting health policy and services (Lumley, 1990; Oakley, 1993; Quéniart, 1992; Sandelowski, 1994; Stewart, 1986; Tudiver, 1993; Waldenström, 1996). Further to this, Neilson and Grant (1989) point out, the majority of research conducted in this field relates to women whose pregnancies are normal. In addition, research related to abnormal outcomes has been unintentionally neglected. By listening to women talk about their health care, policy makers may have an enhanced understanding of some of the attitudes women have about their ability to assess and access care. Research may also assist with planning strategies to overcome any deficits women encounter in our health care system.

Purpose of the Study

The limited research examining the attitudes of women toward the use of sonography in pregnancy warrants attention. The purpose of this study was to explore and describe the attitudes women have toward real-time high resolution sonography during their pregnancy. Based on the literature, the following broad question was used to guide the study: What are the attitudes of women related to the use of ultrasound during their pregnancy? This inquiry provided further insight into the following specific research questions:

1. What are the attitudes of women toward prenatal ultrasound as a routine screening procedure?
2. What reassurance, if any, do women feel following a prenatal ultrasound?
3. What information do women want to receive from a prenatal ultrasound?

Significance of the Study

Biomedical knowledge has consistently outpaced the understanding of social, political and ethical meaning and consequences of procreative technology to society (Gregg, 1993; Lenzinger & Rambert, 1988; Lippman, 1991). Important and interesting as quantifiable data may be, it is essential to explore and understand the feelings or "lived experiences" of the users of health care technology (Gregg, 1993; Lippman, 1989; 1991). According to Lippman (1991) the "lived experiences" or "soft-data" are infrequently studied and in fact constitute no more than one percent of the published contents of major scientific journals.

From a review of research studies in applied human genetics, Lippman (1991) notes that her inquiry clearly demonstrated a gap in attention to the sociocultural context within which reproductive technologies and interventions exist. In a Canadian study done in conjunction with the Royal Commission for New Reproductive Technologies (RCNRT), Tudiver (1993) concurred with this analysis when she explored the experiences of women with technology in pregnancy. Tudiver (1993) states, "technologies cannot be introduced without primary attention being paid and resources allocated to the psychological and societal implications of these technologies" (p.131). Lippman (1991) also urged innovative, interdisciplinary research to enlighten the understanding of ourselves and others, as we apply more and more technology to reproductive needs. Random sampling and statistical analysis can not guarantee information that is sensitive to women's needs; qualitative research methods need to be used as a complement to quantitative data (Lippman, 1991; Tudiver & Hall, 1996).

Today, most women in Canada will experience sonographic scanning during the course of one if not of all their pregnancies. Research related to the effects of prenatal ultrasound has mainly described, in a quantifiable manner, how the procedure might influence bonding, attachment, anxiety, satisfaction and health behaviours. There is a dearth of information in the literature describing the "soft data" - lived experiences or the "wisdom of women" toward the use of this type of technology in pregnancy (Lippman, 1991; Neilson, 1993; Reid & Garcia, 1989). Therefore, it will be helpful to draw on both quantitative and qualitative studies, as they represent different facets of the experience. In addition to the apparent gaps in the literature related to women's views of ultrasound in pregnancy, attitudes are constantly evolving thus it becomes more compelling to explore and describe the feelings women have towards the use of technology during their pregnancies. Knowledge of this nature will also help to incorporate the voice of women when designing and evaluating reproductive health care services (Lippman, 1991; Tudiver, 1993; Tudiver & Hall, 1996).

Philosophical Approach

As the definition suggests, the medicalization of birth has been an insidious phenomenon in which birth was defined in medical terms, as a medical problem, and then completely dominated, influenced and controlled by the domain of medicine (Robinson, 1994). This transformation and the accompanying struggle to regain control over issues and events related to reproductive health have been central to feminist politics since the end of the nineteenth century (Vanderwater, 1992).

Feminist politics make for an ideal framework in which to examine the attitudes of women about the use of technology in pregnancy. In this study, the reproductive technology in question was sonography. Politics of this nature underpin and influence feminist research. Feminist scholarship rests on a feminist philosophy of science, concerned with making women visible through attention to both theoretical and methodological issues (Sigsworth, 1995; Webb, 1984). The nuances of feminist research are well suited to assist with a theoretical approach to this proposed investigation. Feminist research takes gender into account and insists on recognizing the experiences of women (Sigsworth, 1995; Webb, 1984). A feminist approach works toward defining alternatives and understanding everyday experience in order to bring about change. It also provides a challenge to the research protocols of positivism which have in effect denied the authenticity of women's experiences as women and alienated them from their bodies and their collective histories (Webb, 1984).

Feminist inquiry is done for the purpose of finding answers for women. It has a primary goal of presenting a women-centred patterning of human experience and is based on the notion that women value the lived experience, including the feelings of themselves and other women. Therefore, the language engaged during the research process and in the written report is fundamental and must capture the true "voice" of the participants (Campbell & Bunting, 1991; Hall & Stevens, 1991). Characteristics of a feminist investigation include a women-centredness in that: a) women's experiences are the major "object" of the investigation; b) the goal of inquiry is to see the world from the vantage

point of a particular group of women; and c) it is critical in its effort to improve the lot of women and all persons (Campbell & Bunting, 1991).

Recognizing the role of the investigator is key to the use of a feminist framework. Feminism suggests the researcher's point of view should be treated as part of the data (Campbell & Bunting, 1991; Sigsworth, 1995; Webb, 1984). "Feminist research capitalizes on the personhood of the researcher, who uses her feelings and experience to guide her research" (Webb, 1984, p.250). Accordingly, as a feminist, certified midwife and a senior nurse/sonographer, my personhood has to be acknowledged in this research. My interest in the health of women and their life experience is academic, political, professional, and personal. My personal and political interests relate to a philosophy that women should have control over their own bodies. Women must also have information in order to make informed choices in their lives. From my role as a nurse/sonographer, I have come to appreciate that many women submit their bodies to testing without question. Frequently, health care practitioners fail to provide women with appropriate information prior to testing. I am also aware that considerable technology applied to current obstetrical care has not been subjected to randomized control trials and; yet health care practitioners continue to endorse the use of this technology. As well, I have often wondered what pressure clients place on health care practitioners to send them for specific medical testing. As a health care practitioner using ultrasound, it has been my impression women want a prenatal ultrasound for sundry reasons.

The combination of these interests, highlights the need to investigate what women really think about the use of ultrasound in pregnancy and accounts for my academic

interests. Since bias cannot be completely avoided in any study, my personhood will vicariously be part of the research findings. With this in mind, plus the fact that I have not personally experienced an obstetrical sonogram, bias should be minimized. These acknowledgements are, after all, characteristics of the feminist theoretical perspective.

Feminist research tries to minimize hierarchy and acknowledges the potential power differentials between the investigator and study participants (Oakley, 1993; Sigsworth, 1995; Webb, 1984). Knowing that I am a nurse/sonographer, health information from me may be readily valued and desired by the participants. This role should not be viewed as inappropriate nor seen as outside the role of the investigator, rather it can enhance the quality of the research data (Hall & Stevens, 1991; Oakley, 1993). Webb (1984) suggests this role should be seen as a fundamental aspect of feminist research.

In view of the aforementioned criteria, it is unlikely that conventional quantitative methods alone are adequate for studies of women's experiences. Feminist research methods capture the more salient features of a women's social world. Therefore, a key value in a feminist framework is the "voice" or words of women themselves. Therein lies the usefulness of applying feminist inquiry to a research project in which the researcher intends to interview women about their attitudes toward the use of prenatal sonography.

Summary

To date, there is a paucity of research describing the attitudes of women toward the use of ultrasound in pregnancy. This study will help give "voice" to these dispositions which should contribute to an enhanced understanding of the role health care technology plays in society. It will validate the experiences of women as a legitimate source of

knowledge. Consistent with a feminist framework, research of this nature will hopefully enable women to shape the health care they want and that they feel is appropriate to their needs (Sigsworth, 1995).

CHAPTER TWO

Review of the Literature

The literature reviewed for this study spanned a variety of sources: medicine, nursing, government health policy, diagnostic imaging, women's studies, sociology, psychology and literature on the women's health movement. While there is an abundance of literature related to use, risks and benefits and outcomes of ultrasound in pregnancy, there is limited literature related to the psycho-social attitudes women have or their "held beliefs" towards ultrasound in pregnancy. The literature review will be presented under the following main topics: a) medicalization of pregnancy and childbirth; b) influence of technology and scientific knowledge; c) history of ultrasound use in pregnancy; d) psychological perspectives related to ultrasound in pregnancy; and e) controversies related to routine use and screening with ultrasound in pregnancy.

Medicalization of Pregnancy and Childbirth

Before any review of why pregnancy and childbirth today are so greatly influenced and controlled by the use of technology, there is value in understanding why and how this has happened. This premise is also known as the "medicalization theory." The influence of medicine in our lives and women's lives in particular, has been an increasing trend during the second half of this century. This shift, broadly coined as "medicalization," has been described in the literature as an insidious and often undramatic phenomenon in which many aspects of life have come to be defined in medical terms and then defined as medical problems (Miles, 1991; Robinson, 1994; Vanderwater, 1992; Willis, 1989). As the domain of medicine expands, a wider range of human experiences such as aging, addiction

and anxiety have come to be defined and treated according to the medical model (Robinson, 1994; Tudiver, 1993). Normal physiological processes such as menopause have been defined as medical disorders.

In addition to this process, whereby more and more of everyday life has come under medical dominance, others have described an increasing emphasis on the prevention of disease and on health habits and lifestyles, shifting medicine even more into the lives of healthy people (Miles, 1991; Vanderwater, 1992). As medical technology has become increasingly sophisticated and pharmaceutical companies bring new products on to the market, there has been an inclination to make use of medical approaches even prior to the investigation of their benefits through randomized controlled trials (Miles, 1991; Oakley, 1993). This inclination to use medical tests and products just because they exist is sometimes referred to as the "therapeutic imperative."

Medical ideas, practices and products now pervade an ever-increasing scope of our daily lives. Inherent in this trend is a preoccupation with our health, methods to control and or improve it and the resulting medicalization of human existence. For women, the impact of the growth of medical influence has been considerable. Some aspects of increasing medical control on the lives of women in relationship to the human experience include the interpretation and labelling of women's social difficulties and unhappiness as psychiatric problems, the medicalization of natural female biological processes such as menopause, and the intervention of health professionals in the sphere of childbirth and family care (Miles, 1991; Robinson, 1994).

The Influence of Technology and Scientific Knowledge

The profession of obstetrics did not solely result from technological development or the accumulation of scientific knowledge, the role played by these two factors is significant and evident in the history of obstetrics. During the preprofessional period (Appendix A) technology played a minor role in childbirth. On occasion, female midwives used herbal remedies for minor ailments related to pregnancy and during childbirth they administered basic skills if their eyes, ears and hands detected need. In the event of an abnormal situation, such as obstructed labour, the barber-surgeon was called upon to offer assistance (Arney, 1982; Field, 1991; Relyea, 1992).

During the early 1800's however, as more doctors became involved with childbirth, the need to demonstrate their skills took precedence over the natural processes related to childbirth. Social influences began to emerge. The more doctors intervened during the birthing process, the more women expected things to go wrong and therefore expected more intervention. Women began to anticipate difficult births whether or not doctors presented that possibility as a means of selling their skills (Arney, 1982; Wertz & Wertz, 1990). The concept of childbirth as a dangerous event in a woman's life and the promise of medical approaches to alter this concept began to give women a feeling of safety for themselves and their babies.

During the mid 1800's, scientific developments in obstetrical medicine continued to foster a notion of safety and advancement (Appendix B). Some of these developments included the conquest of puerperal fever, pioneering efforts in obstetric anaesthesia, antiseptic practices and the use and refinement of forceps (Burst, 1983; King, 1992; Wertz

& Wertz, 1990). Later, the discovery of antibiotics and the expansion of endocrinology set the stage for further scientific progress (Arney, 1982). While these developments were not totally looked upon as "medicalied birth," they and advancements in community health began to contribite to improved maternal health and birth outcomes.

Practitioners in other areas of medicine began to recognize the importance of obstetrics and demonstrated a willingness to accept obstetricians into the power structure of medicine (Willis, 1989). This period saw midwives slowly disappearing from their role as traditional birth attendants. Medicine played an even greater role in childbirth. The metaphor, "the body as machine" began to evolve as the logic of the time. If birth was taking place by or in a machine, like all machines, there was the potential for breakdown, or in this case, pathology. Technology could control and dominate this pathology as the boundary between normal and abnormal became fuzzy (Arney, 1982; Oakley, 1993; Quéniart, 1992). A tenet reflective of this era is that if childbirth had potential for pathology, then it should be treated like any other entity in the disease paradigm. Arney (1982) labelled the developments of this period as the technology of domineering control (Appendix A).

Obstetrics turned to a new direction shortly after the Second World War. There was less concentration on the body as a machine and more emphasis on the body as a system of systems. All events in a woman's life up to the point of birth became important obstetrical data. All events after birth became potential obstetrical material worthy of study. The prediction of risk was factored in, whereby outcome could be anticipated and controlled (Arney, 1982; Quéniart, 1992; Simkin, 1989). The care of birthing women was

increasingly based on technological innovations (King, 1992). Technology changed to a technology of monitoring, surveillance and normalization (Appendix A). The social organization around birth now included women, partners, families, doctors, nurses and a variety of obstetrical subspecialists. Society got caught up in the powerful web of monitoring (Arney, 1982).

Critics of this trend have strongly argued that increased technology and expanded knowledge have medicalized pregnancy and birth to the detriment of women's experiences and freedoms (Arney, 1982; Oakley, 1993; Quéniart, 1992; Rothman, 1988; Willis, 1989). Oakley (1993) is especially critical of the thoughtless application of new technology (for example, external fetal monitoring and ultrasound) and of the working assumption among obstetricians that more technology means "better." An even greater concern to be noted throughout the drive to medicalize birth is a pattern in which technologies are introduced without clear evidence to demonstrate their effectiveness. Women all over the world have been subjected to their application before the development of guidelines to either restrict the use or appropriately administer these new technologies (Oakley, 1993; Tudiver, 1993).

Since rudimentary reproductive technology dates back to the seventeenth century, rapid advancements in the past twenty-five years have placed women in a new age of decision making related to their bodies and reproduction. Procreative technology such as diagnostic imaging, prenatal diagnosis techniques and infertility testing and treatment have transformed the processes of pregnancy and birth into a business like atmosphere. Some refer to it as a "commodification of life" rather than a normal human experience (Oakley, 1993; Rothman, 1988; Whitbeck, 1988). Pregnant women now routinely pass through a

battery of tests or "quality control," the outcomes of which, may influence whether the pregnancy will proceed (Lippman, 1991; Quéniart, 1992; Rothman, 1988, 1993).

Reproduction technology of the late twentieth century has left women and their families with more questions than answers and perhaps less choice, even though the opportunity for choice might be available. Technology creates power (Mazzeo, 1988; Ruddick, 1988). The following are some of the unanswered questions generated by the medicalization of childbirth: Who controls this power and who exerts the right to use it or refuse it? Do women really have more choice when some technologies are a matter of routine? Do we know what the attitudes of women are towards reproductive technology? Does every pregnancy and birth have to be perfect? Can perfect outcomes be guaranteed or should they? Have these technologies transformed the relationships between a woman and her baby? What are the risks and benefits to society surrounding new reproductive technologies? Do fetal rights ever supersede a mother's rights?

The medicalization of pregnancy and childbirth has been criticized throughout history. Nevertheless, these questions offer some insight as to why there is a growing concern, particularly among feminist scholars, about the continued medicalization of birth, the "disempowerment" of birthing women, and the new idealogy referred to as "the commodification of life" (Rothman, 1988; Whitbeck, 1988). Consumer discontent and activism such as the feminist health movement and women's health movement, opened the door to greater participation by women in matters related to their reproductive health. Feminist writers of this century have also expressed a perspective on medicalized birth that is both poignant and worthy of mention.

History of Sonography in Obstetrics

Although there has been rapid development and application of ultrasound technology in obstetrics over the past twenty-five years, the roots of basic sonography do not lie in medicine but in warfare (Neilson & Grant, 1989; Oakley, 1986, 1993; Petchesky, 1987). Originating in sonar detectors for submarines in World War I, ultrasound was not introduced into medicine until the late 1940's. By the mid 1950's, Ian Donald of Scotland adapted the sonar device to scan for abdominal tumors, many of which turned out to be pregnancies (Neilson & Grant, 1989; Oakley, 1986, 1993; Petchesky, 1987; Stewart, 1986). By the mid 1960's, further imaging techniques such as biparietal diameter measurements had been refined (Neilson & Grant, 1989; Oakley, 1986, 1993). Developments in the 1970's produced a real-time picture that gave a dynamic image of the fetal structure in utero (Milne & Rich, 1981).

The technique of sonography "has evolved from the simple linear display of echoes reflected back to the equipment from tissue interfaces (A-mode) to the real-time systems with two dimensional 'moving' images, which are particularly useful for the study of a continuously moving fetus" (Neilson & Grant, 1989, p.419). Today, dynamic real-time sonography provides the clinician with valuable diagnostic information. This includes fetal biometry (measurements), morphology (visualization of anatomical structures), doppler blood flows and assessment of fetal well-being (Hunter, 1991). Ultrasound is now the imaging technique of choice when conducting invasive prenatal procedures such as amniocentesis, cordocentesis and intrauterine transfusions.

Psychosocial Impact of Obstetrical Sonography

The advent of dynamic real-time sonography in the mid 1970's became the impetus for examining the reactions of pregnant women to their experience of having an ultrasound. Studies by Kohn, Nelson, and Weiner (1980) and Milne and Rich (1981) serve as the foundation for subsequent research relating to the psychosocial impact of obstetrical sonography. Both studies based their research on the concept of maternal imagery and fantasy during pregnancy, leading to enhanced maternal-fetal attachment or bonding. Deutsch in the 1940's and Benedek and Rubin in the 1970's provided the psychoanalytical framework for imaginative imagery in pregnancy (Milne & Rich, 1981).

Milne and Rich and Kohn and colleagues concluded that increased maternal awareness of the pregnancy, arising from having viewed the ultrasound fetal image, aids "bonding" between mother and baby, and that maternal anxiety is often reduced following scanning (Hyde, 1986). Both studies called for further investigation because of the potential for ultrasound fetal imaging to provide therapeutic as well as diagnostic benefits to the maternal-fetal unit.

Development of Maternal-Fetal Attachment

Several authors have questioned whether maternal viewing of the fetus by means of ultrasound before "quickening" accelerates bonding with the fetus (Fletcher & Evans, 1983; Grace, 1983; Heidrich & Cranley, 1989; Kemp & Page, 1987; Lerum & Lo Biondo-Wood, 1989; Petchesky, 1987; Sparling, Seeds & Farran, 1988). The process of bonding is also referred to as attachment (Lerum & Lo Biondo-Wood, 1989). Kemp and Page (1987) describe prenatal maternal-fetal attachment "as the extent to which the woman

engages in behaviors that represent affiliation and interaction with her unborn fetus" (p.179). Some authorities have thought attachment begins much earlier than at birth and, in fact, this relationship between mother and infant hinges on the mother-fetal relationship. The fostering of bonding has become a central issue for modern obstetric practice (Lerum & Lo Biondo-Wood, 1989).

Studies supporting the relationship of maternal-fetal attachment and viewing of the fetus in utero with sonography are some of the earliest reported in this literature. Interestingly, reports of this premise are mixed. Kohn et al. (1980) questioned one hundred women in various stages of pregnancy before and after viewing their baby on ultrasound. Answers to pre and post scan questionnaires were compared to determine what effects, if any, this visualization had on the mother's perception of her baby. Milne and Rich (1981) conducted a descriptive study of 20 women who had an ultrasound in the second and third trimester of pregnancy. Data were collected by unstructured interviews and direct observation. Responses were divided into affective behaviors (direct statements of feelings) and cognitive behaviors (statements about the sonographic images). Findings from both studies suggested ultrasound viewing increased levels of maternal-fetal attachment. From a two-case study, Fletcher and Evans (1983) reported bonding or a sense of belonging occurs before quickening, thus viewing the fetus on ultrasound facilitates this process.

A study by Lerum and Lo Biondo-Wood in 1989 suggested that "having ultrasound scans was significantly correlated to maternal-fetal attachment, implying that parental recognition of the fetal form may be an element" (p.16). Using a convenience sample of

80 pregnant women, the authors explored three variables that could influence maternal-fetal attachment: maternal age, the experience of quickening, and physical symptoms of pregnancy. Results were obtained by filling out the Cranley Maternal-Fetal Attachment scale (MFA scale) and the Pregnancy Symptoms Checklist (PSC). Maternal age and physical symptoms of pregnancy were not found to be related to maternal-fetal attachment, however, quickening and having a prenatal sonogram did demonstrate a positive relationship to the development of attachment. Findings from this study also suggested the degree of maternal-fetal attachment is higher when the pregnancy is planned.

Villeneuve, Laroch, Lippman and Marrache (1988) examined the psychological impact of ultrasound examinations on expectant couples (N=15). The study included direct observation, interviews and completion of a questionnaire. Findings of this study suggested mothers who came to appointments with their partners felt more attachment than mothers who had come alone.

Investigators who report ultrasound not to be significantly correlated with maternal-fetal attachment relate two important explanations. First, many of the early studies failed to indicate at what gestational age their investigations were carried out and it is postulated that attachment may vary at different points in a pregnancy, particularly at the time of quickening. Second, the way ultrasound information is shared with parents is crucial, yet this is an unknown variable and could influence maternal-fetal attachment (Lumley, 1990).

Grace (1983) conducted a study with 81 healthy mother-infant pairs to determine whether any effects of ultrasound-enhanced prenatal image of the fetus on maternal

behaviour could be detected in the early postpartum period. Quantitative analysis indicated no differences in postpartum attachment behaviours between women who had prenatal ultrasound and those who had not (Heidrich & Cranley, 1989).

Another study by Kemp and Page (1987) was carried out at an unspecified time in pregnancy comparing two groups of women, one labelled normal (N=53) and the other high-risk (N=32). The purpose was to compare maternal-fetal attachment between the two groups and identify variables affecting maternal-fetal attachment. Participants completed the Cranley MFA scale and a questionnaire related to specific data about their current pregnancy. The results of a two tailed, pooled *t*-test found no significant correlation between the attachment levels and whether the women had a sonogram during the pregnancy, educational level, age, race, or whether the pregnancy was planned.

Sparling et al. (1988) investigated a number of possible effects that fetal visualization at 20-32 weeks of pregnancy could have on maternal-fetal relationships. The study group consisted of 80 women divided into three groups: confirmed fetal impairment (N=39); questionable fetal impairment (N=34); and normal fetuses (N=35). These groupings were based on ultrasound reports and maternal health status. Results were measured by psychological assessments, semi-structured interviews and completion of written assessments. The findings of this study agreed with others that visualization of the fetus by ultrasound does not affect attachment.

Heidrich and Cranley (1989) examined 91 women during the second trimester of pregnancy for the relationship between fetal movement, ultrasound scanning and amniocentesis on maternal-fetal attachment. Thirty-five percent of the women were first

time mothers and sixty-five percent were multigravida. Participants completed the Cranley MFA scale and Perception of the Fetus (PIF) scale. This study, despite anecdotal evidence in support of the positive effect of ultrasound on attachment, did not support the proposed relationship.

Technological Quickening

Quickening is a term used to describe the pregnant woman's initial perception of fetal movement. It typically first occurs at 16 to 18 weeks of pregnancy and has been customarily viewed as the turning point in the establishment of the maternal-fetal bond (Lerum & Lo Biondo-Wood, 1989; Sandelowski, 1988). Quickening also plays a role in the differential diagnosis and dating of pregnancy and offers women positive confirmation of their pregnancy (Sandelowski, 1988). Quickening is described as the vital stimulus to maternal embodiment and differentiation of the fetus and to the woman's acceptance of their pregnancy as real (Petchesky, 1987; Sandelowski, 1988; Waldenström, 1996).

As previously noted, several investigators have questioned whether parental viewing of the early fetus, before quickening, by means of ultrasound imaging accelerates bonding with the fetus (Fletcher & Evans, 1983; Heidrich & Cranley, 1989; Lerum & Lo Biondo-Wood, 1989; Sandelowski, 1988; Villeneuve et al., 1988; Waldenström, 1996). Sandelowski (1988, 1994) postulates that today's reproductive technology has now created something called "technological" quickening. She suggests that the advent of diagnostic sonography, especially real-time ultrasound performed prior to the 16th week of pregnancy, is altering the importance of quickening as a validator of pregnancy and as a stimulus of maternal-fetal attachment. Waldenström (1996) also wonders if there is "a risk

that ultrasound screening reduces the woman's sensitivity to her own bodily signals, and that the image of the baby on the screen replaces her internal image of the baby" (p.169)?

Lerum and Lo Biondo-Wood (1989) using the Cranley MFA scale demonstrated a significant positive relationship between quickening and the development of maternal-fetal attachment. They failed, however, to say at what gestational age the ultrasounds were performed but acknowledged this to be a key variable. Lumley's (1990) review of the literature noted that "observational studies suggest that scans done early may slightly improve maternal-fetal bonding but that those done after quickening are not associated with attachment" (p.214).

The study by Villeneuve et al. (1988) did not concur with these earlier studies. While studies agree that fetal movements perceived on the screen are equated with life and reassurance, women probably feel the same when quickening occurs. Women in this study who felt quickening prior to their ultrasound exam, felt this confirmation of their pregnancy to be more important than seeing the fetus on a screen. Villeneuve et al. (1988) explained this by stating, "the visual awareness of the baby is a brief experience as compared to the visceral awareness coming from the proprioceptive sensations of quickening which are present for many months" (p.534).

Kemp and Page (1987) called for additional research examining the relationship between ultrasound and maternal-fetal attachment. They felt there was need to: a) develop a tool to evaluate prenatal attachment before quickening; b) replicate studies that control for additional factors such as gestational age and type of risk; c) assess maternal-fetal attachment during normal and abnormal pregnancies (maternal state and fetal

abnormalities); and d) conduct studies that examine the father's role in attachment.

The literature review confirmed some of these suggested investigations have been conducted while others have not. Currently there is no tool available to measure maternal-fetal attachment prior to quickening. Replicated studies have continued to assess the impact of psychosocial effects of prenatal ultrasound but not in particular populations such as first trimester or only high risk pregnancies. Several authors have now included fathers in their studies. One, a Canadian study, reported on earlier by Villeneuve was done in 1988 and another was a Swedish study, done in 1997 by Eurenius, Axelsson, Gallstedt-Fransson and Sjaden. While the study by Eurenius et al. did not evaluate the father's role specifically with respect to fetal attachment, fathers found the experience of viewing their baby on an ultrasound screen to be a positive event.

Anxiety and Feedback

There are numerous and consistent reports in the literature that women show increased levels of anxiety and other negative emotions during pregnancy. These changes have been attributed to both physiological and psychological factors. Sources suggest possible factors might be: changes in hormonal levels, increased preoccupation with health and baby changes and intense concern for fetal well-being (Cox, Whittman, Hess, Ross, Lind & Lindahl, 1987; Gregg, 1993; Lippman, 1991; Milne & Rich, 1981; Reading & Cox, 1982; Sandelowski, 1988, 1994; Sparling, Seeds & Farran, 1988; Zlotogorski, Tadmor, Duniec, Rabinowitz & Diamant, 1995, 1996). Sandelowski (1988, 1994) claims the availability of reproductive techniques such as sonography and amniocentesis has added to the anxiety felt by women in that more choice is available and waiting for test

results and making decisions after results are known heightens many emotional responses.

Several studies have evaluated effects of ultrasound scanning on maternal anxiety levels. A closely linked variable in these studies was the role or effect of feedback received during the scan. Milne and Rich (1981) provided some of the first research into the effects felt by women who had undergone real-time sonography during their pregnancy. These authors reported both verbal and non-verbal behaviors to be strongly suggestive of anxiety toward both the procedure itself as well as the context and significance of the information they received. Comparison of pre and post sonar anxieties suggested that ultrasound did allay specific anxiety about gross fetal anomalies.

Reading and Cox (1982) assessed the psychological effects of real time sonography on pregnant women's attitudes and anxiety levels. Women were randomly divided into two groups: a) high feedback (N=67), where women saw the fetus on a monitor and received information about the examination as it was conducted; and b) low feedback (N=62), where women did not see the fetus on a monitor and received no specific feedback during the scan. A third group of women (N=55), who did not have a scan was assessed to act as a control group. All subjects were in the first trimester of pregnancy and completed a State Anxiety Inventory Scale (SAIS) to assess their anxiety level.

This study reported that all three groups had low levels of state anxiety (transitory emotional state usually sensitive to situational cues), with no between group differences. This suggests an absence of effect on anxiety as a result of ultrasound. In a further analysis of this study, Lumley (1990) felt this randomized trial showed scanning actually increased the women's anxiety but the positive feedback reduced it, so that there were no

significant differences in anxiety between the scanned and unscanned groups.

Following these initial investigations of the degree of feedback and its effects on anxiety, several authors confirmed the importance of feedback. Hyde (1986) noted an important source of dissatisfaction was failure of the operator to reveal and/or explain the fetal image. In a Canadian study by Cox, Whittman, Hess, Ross, Lind and Lindahl (1987), the psychological impact of diagnostic obstetrical ultrasound was examined in low and high risk pregnancies. Women were assigned consecutively to either a high feedback group (N=50) or low feedback group (N=50). All examinations were conducted between eight and sixteen weeks gestation. Prior to their scan women completed the A-State scale of the State-Trait Anxiety Inventory (STAI). Post scan this questionnaire was repeated along with the Subjective Stress Scale. If present, partners of the women were asked to participate in the assessment and, if they agreed, completed the same questionnaires.

Results of this study indicated the emotional impact of ultrasound was influenced by the level of feedback provided. Those in the high feedback group indicated less anxiety and more positive emotional experiences during the scan when compared with those who received less feedback. Although the numbers were small (N=41), partners also displayed less anxiety when high feedback was received. This may in turn support an enhanced role of the male partner in pregnancy. The authors encourage extensive feedback in both low and high risk pregnancies.

Sparling et al. (1988) examined the relationships between the mother's knowledge of fetal health gained by ultrasound and maternal psychological attachment including anxiety for the fetus. Participants were divided into three groups: a) women with confirmed fetal

impairment (N=39); b) women with a questionable fetal impairment (N=34); and c) women with normal fetuses (N=35). Variables assessed by quantitative scales included: a) maternal mental health (anxiety, depression and hostility); b) medical/mother interaction and c) maternal-infant behaviour. Results indicated that as the mother received more definitive information (i.e., feedback), scores of measures of anxiety, depression and hostility decreased.

More recent research in this area has been conducted by Zlotogorski and associates. These investigators (1995, 1996) measured anxiety levels (state-situational and trait) before and after ultrasound examinations of 183 women who underwent this procedure as part of their routine prenatal care. Subjects had a mean of 2.37 ultrasound scans during their present pregnancy. They completed a series of anxiety testing questionnaires pre and post scan: Spielberger's STAI, Miller Behavioural Style Scale and the Self Control Schedule. Subjects were also randomly assigned to high and low feedback groups to allow for comparison. Findings of this study indicate significant reductions in state or situational anxiety levels for all subjects while trait anxiety was unaffected. These findings confirm those of Reading and Cox (1982) some thirteen years earlier in which neither the level of feedback, gestational age nor previous sonogram experience were found to be related to decreases in state anxiety levels.

The findings of these studies suggest the interaction and communication between the individual performing the ultrasound and the parents have important ramifications. Many factors influence how the information is given and by whom. Traditionally, sonographers

(technicians) perform the scan with test results being given by medical personnel. More recently, nurses and midwives have been trained to conduct sonograms.

Research findings reveal that the role of health care practitioners in diagnostic imaging needs to be clearly defined. Women need to be informed ahead of testing what information each practitioner is allowed to provide. There is no place for lack of communication; information must be given in a sensitive and understanding manner. Tudiver (1993) supports these premises. She emphasized, "the experiences of testing become part of the memory each woman constructs of a particular pregnancy" (p.77). These experiences will, after all, create memories of a lifetime, suggesting a need to better understand how women feel about the use of reproductive technology (Tudiver, 1993).

Maternal Health Behaviour

Clinicians and researchers have suggested that ultrasound can be used to encourage maternal behaviour and compliance to medical regimens prescribed on behalf of the fetus (Eurenius, Axelsson & Sjoden, 1996; Hyde, 1986; Lippman, 1991; Lumley, 1990; Reading, Campbell, Cox & Sledmere, 1982; Sandelowski, 1988, 1994; Stewart, 1986; Thorpe et al., 1993). Fletcher and Evans (1983) observed that the reality of providing a "real" image of the fetus could become the basis of improved maternal activities in pregnancy. Sandelowski (1989) states, "the ultrasound picture was a powerful agent of compliance worth, in contrast to professional preaching, a thousand words" (p.39). There is, however, limited and conflicting research to support this premise.

In the course of examining psychological effects of ultrasound in pregnancy (Reading & Cox, 1982), health beliefs and behavior were assessed by Reading et al. (1982). Both

study groups, high feedback (N=67) and low feedback (N=62), had repeat routine scans at 16 weeks gestation. Prior to the scan each participant completed a questionnaire concerned with health beliefs and behaviour: smoking, alcohol consumption, dental visits, clothing changes and sexual practice. The purpose of this investigation was to assess whether or not the type of feedback related to health advice given at the first ultrasound (done at 10-14 weeks gestation) affected any of the aforementioned health benefits or behaviours.

Results from this study demonstrate that exposure to high feedback scans was consistently related to more appropriate behaviour change. Short term effects on maternal health behaviour such as less smoking, less alcohol consumption and more visits to the dentist were detected in this randomized trial when detailed feedback was provided during the scan (Lumley, 1990).

What was not clearly identified in this study is whether or not it was the ultrasound that was responsible for the changes in behaviour or the feedback. The authors suggest that the actual sonographic imaging of the fetus in utero may serve as a trigger function and through the ultrasound, the autonomous status of the fetus is realized and the potential for harm from the various behaviours is assimilated with this visual experience (Reading et al., 1982).

Others have investigated the relationship of maternal smoking in pregnancy and viewing of the fetus with sonography. Waldenström et al. (1988) found mean birthweights were higher in a screened (scanned) group of women in Sweden.

The authors speculated the reason could have been related to a reduced smoking pattern in women who had watched their fetus on an ultrasound monitor.

Pregnancy, ultrasound screening and smoking attitudes were assessed by Eureninus et al. (1996). This study, using a questionnaire format, was performed to evaluate screening as a tool to help reduce smoking among 300 pregnant women and their partners. Prior to pregnancy, 22% of women smoked versus 21% of the men. Fifty-four percent of the women altered their smoking habits upon learning of their pregnancy and before the scan. Nineteen percent of the partners did the same. The notion of "altered" has not been explained, that is, did they quit smoking or simply reduce the amount smoked each day? Nevertheless, before the scan 54% of the women and 49% of the men estimated their ability to stop smoking later in pregnancy as greater than 50%. These figures did not change following an ultrasound examination.

Madarikan, Tew and Lari (1990) sent out 39 postnatal questionnaires to women who had been given information during their ultrasound which suggested their fetus had a diagnosis of uropathy (pathologic change in the urinary tract). While the main premise of this study was to investigate maternal reaction and communication efforts for this subgroup, questions related to maternal health behaviours were also addressed. Twenty-nine mothers returned their questionnaires. Results indicated these expectant mothers reduced their consumption of tobacco and alcohol during the remainder of their pregnancy. Nevertheless, like Reading et al. (1982), the authors questioned the possible cause and effect relationship with respect to the many variables involved. Was it the health education, high feedback, knowledge of a possible fetal anomaly or the actual

sonographic fetal images that caused the reduction of smoking and alcoholic intake? Unfortunately, this is a limitation of the study.

Reassurance

There is limited research examining whether or not an ultrasound in pregnancy is found by women to be reassuring. What research is available appears to be closely linked to the concepts of anxiety and feedback. Several authors have suggested that prenatal ultrasound is reassuring because it alleviates the anxiety it has itself generated (Lumley, 1990; Sandelowski, 1988; Schei, 1992; Statham & Green, 1997; Stewart, 1986).

Neilson and Grant (1989) suggested the reassurance women receive from an obstetrical sonogram depends on the circumstances in which the woman received care. Waldenström (1996) felt that women have an expectation from their scan to receive confirmation that their baby is healthy, thus reassuring them everything was normal before becoming emotionally involved with their pregnancy. According to Waldenström (1996) there is no study of ultrasonography in pregnancy which specifically addresses the subject of reassurance.

Two studies have vicariously reported on reassurance as it applies to sonography and pregnancy. Both are qualitative studies in which pregnant women were interviewed about their attitudes or views toward ultrasound scanning in pregnancy. Hyde (1986) interviewed 404 participants about various aspects of pregnancy as they experienced it, including attitudes to sonography. Women were approached to enter the study in two different geographical sites. One site routinely scanned women at 16 weeks gestation (N=97) and the other site scanned women for clinical indications only (N=307). The

women in the latter group did not know whether or not they would have an ultrasound during their pregnancy.

This study reported that the unscanned women in the centre where sonography was used selectively were less likely to think that an ultrasound would be reassuring. This group also believed sonography should not be used routinely during pregnancy (Neilson & Grant, 1989; Thorpe et al., 1993). An additional finding of this study was an important source of dissatisfaction among the women in the selective sonogram group. Some felt their attitudes were influenced by the fact that they received very little explanation (i.e., feedback) during a scan if they did have one; this had been an expectation of the experience. The importance of feedback during a sonogram has been previously discussed in this manuscript (Reading & Cox, 1982; Cox et al., 1987; Sparling et al., 1988; Zlotogorski et al., 1995, 1996).

In 1993, Thorpe et al. conducted a study that questioned whether the routine use of ultrasound in pregnancy implicitly conveyed the message that its use in antenatal care was both valuable and safe. They interviewed 30 women who consented (12 declined) to have cerebral sonography on their newborn infants. While the study was designed to examine women's reaction to cerebral sonography on their newborns, they were also asked about their views and knowledge of their ultrasound experience during pregnancy. Of the original 42 women, 39 (93%) had experienced a prenatal ultrasound as part of routine screening.

It is important to note that the findings of this study were derived from research which was not specifically designed to examine mothers' views of their prenatal

ultrasound. Therefore, this must be considered a limitation of the study. While few women directly addressed the issues of efficiency and safety, a generalized concern about ultrasound techniques was found to underlie many of the women's comments and expressions. Mothers reported an acceptability of obstetrical sonography and spoke with great emotion about their experiences with prenatal ultrasound. As reported by others, these women viewed their scan as a confirmation of their pregnancy and found it reassuring.

Routine Ultrasound in Pregnancy (RUIP)

There is universal consensus that selective diagnostic obstetrical sonography has resulted in considerable improvements in antenatal care and pregnancy outcome without major complications (Canadian Task Force on the Periodic Health Examination, 1992; Grant, 1986; Neilson & Grant, 1989; Petchesky, 1987; Thorpe et al., 1993; Waldenström, 1996). There is little consensus and, in fact, much controversy related to the use of routine ultrasound in pregnancy and in particular the use of RUIP as a screening test for the detection of fetal anomalies (BCOHTA 96:2D, 1996; Dowswell & Hewison, 1994; Petchesky, 1987; Schei, 1992; Thorpe et al., 1993; Waldenström, 1996).

The use of sonography in pregnancy, like many technical innovations in medicine, was a serendipitous rather than a rational process. Clinical trials reporting the effectiveness and safety of obstetrical sonography were not reported until 1980, fourteen years after the first British medical centre described this technique (Oakley, 1986, 1993). According to Oakley (1993), "ultrasound is not the only obstetrical technique which has been subjected rather late in its history to the scrutiny of a controlled trial" (p.193). Oakley (1993)

describes the career of a medical innovation in seven stages (Appendix C). She places routine ultrasound in pregnancy in stage five, whereby results of careful clinical trials are finally published.

Despite the controversy, RUIP is widely accepted throughout most countries of the developed world (Appendix D). In the United Kingdom, the Royal College of Obstetricians and Gynaecologists recommends a single screening ultrasound in the early second trimester of pregnancy (Dowswell & Hewison, 1994). Two ultrasound examinations in all pregnancies is the official guideline in Germany (Salem, 1986). Norway advocates for a one-stage screening programme and currently 96.6% of all pregnant women participate (Schei, 1992; Waldenström et al, 1988). In the state of Victoria, Australia, 97% of pregnant women had a scan in 1991-1992 and 45% had more than one scan during the same pregnancy (CBC Ideas Transcripts, 1993; Waldenström, 1996). In France, essentially every pregnant woman receives four scans (CBC Ideas Transcripts, 1993; Salem, 1986).

Although sonographic screening in pregnancy is not "routine" in Canada and the United States, a large proportion of women in these respective countries do have an ultrasound at some stage in their pregnancy. In the United States, about 80% of women are routinely screened (CBC Ideas Transcripts, 1993). In Canada, the Society of Obstetricians and Gynecologists of Canada (SOGC) and the Canadian Task Force on the Periodic Health Examination (CTFPHE) recommends offering a prenatal ultrasound to all women at 18 weeks gestation. Women are to be informed that the purpose of the examination is to confirm gestational age (estimating expected date of confinement), rule

out multiple gestation and screen for birth defects. While figures vary across Canada, some current estimates for sonographic examinations during pregnancy are: a) Saskatchewan 1.5 scans per pregnancy; b) British Columbia 1.7 scans per pregnancy; c) Ontario 2.1 scans per pregnancy; and d) Manitoba 2.56 scans per pregnancy (Driver, 1996; Tudiver, 1993).

Advocates of routine sonographic prenatal screening claim the method is safe, it seems to reduce the induction of labour rates of post date pregnancy and it serves as a valuable tool in detection of fetal anomalies and multiple gestations. Current information suggests established benefits outweigh harms, if indeed there are harms (CTFPHE 1992; Schei, 1992; Thorpe et al., 1993; Waldenström, 1996). Nevertheless, doubts about routine screening continue to appear in the literature and the limitations of this technology for detecting adverse effects in such a widely used screening procedure continue to surface (CTFPHE, 1992; CBC Ideas Transcripts, 1993; Lippman, 1991; Driver, 1996; Waldenström, 1996).Opponents of routine sonographic prenatal screening offer strong evidence in support of their position. Oakley (1993) compares the current status of ultrasound technology as a screening device in pregnancy with that of X-ray technology in the 1950's. As with the situation for X-ray at that time, there are no known adverse effects for sonography. History would eventually demonstrate adverse effects from the use of X-ray technology in pregnancy. Ultrasound in pregnancy does not have a history of sufficient duration to enable the assessment of long term sequelae, therefore all the more reason to not offer it routinely (Oakley, 1993; Thorpe et al., 1993; Waldenström, 1996).

Additional arguments against a policy of offering routine sonography include: a) its value in low risk pregnancies remains unproven; b) the potential of false-positive diagnosis continues to exist; c) routine presentation of ultrasound conveys an implicit message that the procedure is valuable, safe and acceptable; and d) in the absence of evidence based benefits create unrealistic expectations of physicians and the health care system which lead to inappropriate use and possible liability (CTFPHE 1992; Ewigman, Lefevre, Bain, Crane & McNellis, 1990; Schei, 1992; Thorpe et al., 1993; Waldenström, 1996).

From a literature review there appears to be an absence of clear guidelines as to the role of RUIP. Some reports suggest routine ultrasound should be offered as a prenatal diagnostic (PND) screening test along with amniocentesis, chorionic villus sampling (CVS) and maternal serum alpha-fetoprotein (MSAFP) (Royal Commission for New reproductive Technologies, 1993). Other reports claim its use is strictly to determine gestational age, rule out multiple gestations and placental abnormalities and detect intrauterine growth restriction (CTFPHE, 1992).

Certainly, if the goal of prenatal sonographic screening is to reduce the rates of perinatal illness and death, the effectiveness of a single examination in increasing fetal survival through early detection of treatable prenatal problems has yet to be clearly demonstrated (CTFPHE, 1992). Along with the uncertainty of the "purpose" of RUIP are the lack of guidelines as to the timing of the procedure and the level of expertise of the sonographer.

In 1995, the British Columbia Office of Health Technology Assessment (BCOHTA) was asked by the British Columbia Council on Clinical Practice Guidelines (BCCCPG) to

conduct a review of the research and guidelines in support of routine ultrasound imaging in pregnancy. Nineteen published documents and reports were identified of which six met the pre-determined criteria for detailed appraisal (published in 1990 or later and based on evidence-based process). These included: a) Royal Commission for New Reproductive Technologies (RCNRT) (1993); b) Bucher and Schmidt Meta-Analysis (1993); c) Canadian Task Force on the Periodic Health Examination (CTFPHE) (1994); d) Cochrane Collaboration (CC) (1995); e) Saskatchewan Health Services Utilization and Research Commission (HSURC) (1996); and f) U.S. Preventive Services Task Force (USPSTF) (1996). "All six documents incorporated the findings of four recent, well designed randomized controlled trials (RCT's) examining selective versus routine ultrasound imaging in low-risk women in early pregnancy (i.e., before 20 weeks gestational age)" (BCOHTA, 1996, p.1). Three of the reports, the CTFPHE, CC, and USPSTF also included the results of the largest trial, the American Routine Antenatal Diagnostic Imaging with Ultrasound (RADIUS) study published in 1993.

The five clinical trials were conducted through a nine year period from 1984 to 1993 (Bakketeig, Eik-Nes, Jacobsen, Ulstein, Brodtkorb, Balstad et al., 1984; Ewigman, LeFevre & Hesser, 1990; Ewigman, Crane, Frigoletto, Lefevre, Bain & McNellis, 1993; Saari-Kemppainen, Karjalainen, Ylostalo & Heinonen, 1990; Waldenström et al., 1988). Over 30,000 low-risk women were randomized to either routine scanning or selective scanning (accepted indication). "Collectively, these RCT's were clearly large enough to detect a meaningful positive effect on outcomes had one been present, so the absence of benefit is not attributable to low power" (BCOHTA, 1996, p.2).

The authors of the BCOHTA report used the following parameters on which to base their conclusions: a) how good is ultrasound as a test; b) does obtaining prenatal ultrasound screening result in a change in management; and c) does screening result in a change in outcome? Following analysis, the authors reported that none of the studies reviewed supported benefits from routine scanning in terms of maternal or perinatal mortality or morbidity. RUIP does detect most multiple gestations, some major fetal anomalies and intrauterine growth restriction (IUGR). Nevertheless, detection of these conditions through routine monitoring did not result in changes in final health outcomes.

Although all six documents were based on the same studies, a variety of recommendations emerged. The CTFPHE and the CC report endorsed RUIP while the others recommended ultrasound be used selectively in pregnancy. Even though the mandates of the documents varied, it was felt the recommendation differences were based almost exclusively on the different views about what counts as legitimate outcomes.

The BCOHTA authors felt the meta-analysis conducted by Bucher and Schmidt (1993) came closest to providing conclusions in alignment with the evidence base. In their analysis, Bucher and Schmidt used the following outcome variables: live birth rate, perinatal mortality, proportion of babies with Apgar score <7 at one minute and rate of labour induction. The BCOHTA review also used this set of outcome criteria. In contrast, the CC report used process and intermediate outcome variables: termination of pregnancy (TOP), perinatal mortality, low Apgar scores, induced labour and undiagnosed twins.

The BCOHTA report (1996) concluded by stating, "the available research evidence weakly supports the use of routine prenatal ultrasound only within the context of an

organized program of prenatal screening for fetal abnormalities" (p.66). Such a program should include pre and post test counselling, improved accuracy rates of malformation detection and protocols for obtaining informed consent prior to screening. These concerns have been previously described and reinforced by others who have questioned the lack of evidence to support RUIP. Nevertheless, the BCOHTA report probably represents the most efficient analysis of RUIP done to date and its recommendations need serious consideration as new health care practices and policies emerge in this time of health care reform.

Despite the lack of evidence to support routine sonography as an effective diagnostic screening test and or prenatal procedure, there have been massive increases in the number and cost of scans performed in Canada (Appendix E). The need therefore, to determine the effectiveness of this procedure becomes even more critical as it has major implications for resource allocation and future medical practice patterns (RCNRT, 1993). In addition to a lack of evidence supporting routine sonography as a safe and effective screening test, the positive and negative psychological effects of screening on parents have not been adequately assessed (CTFPHE, 1992).

Attitudes of Women Toward Sonography in Pregnancy

Thorpe et al. (1993) addressed some of the aforementioned concerns in their study when they examined women's views of ultrasonography with respect to the following issues: a) the value and acceptability of routine use; b) safety; and c) informed consent. The characteristics of this research have been previously reported in this manuscript.

All 42 mothers originally asked to participate in this study agreed to participate in this aspect of the investigation.

The safety of ultrasound emerged as a prominent theme in their comparison with cerebral sonography. Views about the purpose of ultrasound varied. Some did not view it as strictly diagnostic but rather as a reassuring confirmation of pregnancy. All of these mothers delivered normal healthy babies which might explain why they did not question the efficacy of sonography as a screening test. These authors suggest from their findings that routine prenatal ultrasound has been generally accepted and indeed sometimes demanded by women. But they also question whether or not the "routine" presentation of ultrasound to pregnant women conveys the message that the procedure is valuable, safe and acceptable.

Jorgensen (1995) examined the attitudes of women towards the prenatal screening tests of MSAFP, amniocentesis, CVS and ultrasound. Findings were based on questionnaire responses from 3,331 women who had agreed to MSAFP testing and 336 women who had declined testing. The study was conducted in two different geographical regions of Denmark. In general, this study showed a significant difference in views of prenatal screening, diagnosis and continued research in this field. Women who had declined MSAFP testing appear to be less enthusiastic toward all of these issues than women who were willing to accept testing. Seventy percent of the participants felt ultrasound should be offered as a screening test for detecting fetal anomalies. There were, however, differences in acceptance within the two tested regions (89% agreed with routine sonographic screening at Site A and 56% agreed at Site B). When ultrasound

screening was offered routinely, the acceptance rate in Denmark was generally high, approximately 85-90%.

From this finding, Jorgensen stresses the importance of control groups when conducting research of this nature. The author also postulated that this response to routine prenatal ultrasound screening could have been dependent on how the system of prenatal testing was organized in each region. If this is a variable to consider, the generalizability of these research findings would be questionable if this variable had not been considered during analysis.

The most recent research reported in this area was done in Sweden by Eurenius, Axelsson, Gallstedt-Fransson and Sjoden (1996). The purpose of this study was to evaluate pre-scan counselling, the provision of information to parents-to-be, parental expectations before the ultrasound and experiences of the second trimester (13-26 weeks gestation) routine examination. Three hundred and three consecutive women and their partners attending for their routine ultrasound were asked to participate. Two hundred and ninety-nine women (99%) and 255 (98%) partners agreed to answer two questionnaires; not all women were accompanied by their partners. One questionnaire was done in the waiting room before the scan and the other was to be answered at home following the scan and returned by mail. Women received verbal information at their antenatal care centre prior to the scan and written information from the Ultrasound Department. Both parents received additional information (i.e., feedback) during the examination.

Results suggest there is a high degree of agreement in opinions and attitudes between pregnant women and their partners in relationship to ultrasound examination experiences. This supports the findings of Villeneuve et al. (1988) where expectant fathers felt as positive as mothers about sonography in pregnancy.

Since the written information received by the parents did say the examination may detect serious fetal malformations, 89% of the women and 84% of the men thought the purpose of the scanning was detection of anomalies. Despite this knowledge, to see their baby on the ultrasound monitor was a positive and reassuring experience for parents-to-be. Only 57% of the women received information from their antenatal care centre, but 88% of the women and 85% of the partners said they obtained sufficient information (feedback) during the scan.

This study supports previous research that confirmed the importance of feedback during an obstetrical ultrasound and positive parental feelings about the use of this type of prenatal technology. The authors do, however, see the provision of information in this context as a potential problem. Their reasoning is mainly due to the large number of women who undergo sonography in pregnancy. They suggest both written and verbal information is required and perhaps the signing of an informed consent form may improve the flow of information. Eurenius et al. (1997) also suggest the information should be locally based since screening programmes can vary in approach, which concurs with the findings of others (Jorgensen, 1995).

Summary

This chapter has outlined the rationale for this study. Today, few women in Canada will experience a pregnancy without at least one ultrasound examination. Traditional research has examined several aspects of the use of sonography in pregnancy and they include: psychosocial impact of obstetrical sonography, development of maternal-fetal attachment, "technological" quickening, anxiety and feedback, maternal health behaviour, and reassurance. But of all the inquiries into the use of prenatal sonography , the most controversial issue relates to the use of sonography as a "routine" screening test without the evidence to support this practice as a means of improving fetal outcome.

It is evident from the literature review that there is a paucity of scientific inquiry investigating the attitudes of women toward the use of ultrasound in pregnancy. Since quantitative or experimental investigations have been unable to clearly answer questions related to the value of RUIP, an inquiry as to how women feel about the use of ultrasound in their pregnancy may shed new light on this particular technology in pregnancy. In addition, an examination of women's attitudes could contribute to the development of definitive guidelines for the future use of sonography in pregnancy.

CHAPTER THREE

Methodology

The purpose of this study was to explore and describe the attitudes women have toward the use of real-time high resolution sonography during their pregnancies. The strategies of qualitative research are well suited to achieve this goal. The following chapter will outline the research design and the procedures used to collect and analyze the data. It will also present a description of the study participants and outline the ethical considerations for the study.

Research Design

Qualitative research is described as a holistic approach to questions that recognize the complexity of human living (Lo Biondo-Wood & Haber, 1994; Polit & Hungler, 1995). Wilson (1989) states that qualitative analysis is nonnumeric organization and interpretation of data used to discover patterns, themes, forms, examples and qualities found in a variety of texts and documents. The investigator of qualitative research becomes the "instrument" in both data collection and analysis (Sorrell & Redmond, 1995; Wilson, 1989). Thus a primary factor in the understanding of qualitative research is that the researcher is pivotal to the findings and must be acknowledged in the final analysis (Lewthwaite & Klassen, 1997; Lo Biondo-Wood & Haber, 1994).

The many qualitative research designs available generate new and rich descriptions of life's events (Bailey, 1997; Fetterman, 1989; Polit & Hungler, 1995). "There is increasing recognition among the health professions of the value of qualitative research in understanding complex issues and processes in primary health care not easily addressed in

other ways" (Tudiver, 1993, p.20). Pregnancy and childbirth are two such processes in life which lend themselves to the insightful investigation of qualitative research (Lewthwaite & Klassen, 1997).

Drawing from the tenets of ethnography, the research method for this study used semi-structured interviews to obtain "rich" data from the "insider's" point of view or women who had undergone a prenatal sonogram (Lo Biondo-Wood & Haber, 1994; Wilson, 1989). By conducting interviews with women, the researcher can collect the insightful descriptions these individuals offer to better understand the "lived experience" of having an ultrasound (Bailey, 1997; Fetterman, 1989). This research is also oriented toward understanding the shared meaning of common actions and events that will allow women an opportunity to express the similarities and differences of their sonographic experience (Huffman & Sandelowski, 1997; Sorrell & Redmond, 1995).Content analysis, a procedure for analyzing unstructured qualitative data, was utilized in this study.

Pregnancy, while being a biological state, is also a social and cultural construct. It is a special period in a woman's life, filled with unique traditions, values and behaviours. It is a time when women themselves can use their actual experience as a basis to develop new knowledge within the realm of women's health (LaLonde, 1997). There is, however, as previously highlighted, limited knowledge about the attitudes of women toward the use of technology in pregnancy and in particular, routine diagnostic sonography. All the participants of this study had an ultrasound in their pregnancy.

Study Participants

Potential participants were drawn from a convenience sample of women who had attended for a prenatal sonogram in a midwest Canadian urban health care centre. There were no restrictions to: maternal age, ethnic background and gestational age of the pregnancy. The study was not to be restricted to either primigravida nor multiparous women as the inclusion of both would add further to the rich feelings and attitudes of both groups. There were, however, restrictions to women having any complication(s) as the pregnancy experience may be extremely different for those with complications. Participants were described as having a normal or uncomplicated pregnancy up to and including the time of their interview. Additional inclusion criteria for the study were:

1. Be able to read, write and speak English, for the purpose of communication;
2. Be willing to spend one to one and one-half hours in a quiet setting for a audio-taped interview;
3. Be available by telephone to arrange an interview.

The study size was determined when data analysis revealed saturation; 20 participants was considered a minimum. Determining adequate sample size in qualitative research is dependent on the quality of information per sampling unit. The research and sampling methods employed helped to achieve adequate data for analysis (Sandelowski, 1995).

The investigator asked medical sonographers of an urban health care centre to inform potential participants of the study and give them a letter of introduction (Appendix F). If interested, the sonographer had potential participants record their name and telephone number which was then forwarded to the investigator. The potential participants were

then contacted via a telephone call by the study investigator (Appendix G).

Once contact had been made, eligibility criteria for interested participants were reconfirmed. A date, time and place for signing the consent form and interview were arranged. A written explanation of the study was provided to the participant at that time (Appendix H). Additionally, participants were assured of their rights to withdraw from the study at any time and their right not to answer questions they felt uncomfortable with or invasive. Confidentiality of the participant's name, demographics and interview data was emphasized.

Data Collection

The principal methodology for data collection was one semi-structured interview with each study participant. The interviews were tape-recorded. Demographic information for each participant was collected throughout the course of the interview.

The semi-structured interview allows for flexibility when gathering information rather than asking specific questions in a specific order (Polit & Hungler, 1995). The interview is an effective data collection tool for qualitative research and, when done well feels like a natural dialogue, yet answers unasked questions (Fetterman, 1989; Sorrell & Redmond, 1995). The interview takes the form of a conversation which allows for spontaneity (Fetterman, 1989; Polit & Hungler, 1995; Sorrell & Redmond, 1995).

Several open-ended questions (Appendix I) were used to enable the participants to describe their attitudes toward prenatal ultrasound. These questions also served as an agenda to guide the interview process as deviation from the topic could easily occur. Sometimes, however, deviation produces valuable data (Fetterman, 1989). The questions

were developed from the investigator's knowledge and experience from working with pregnant women during an ultrasound examination. The purpose of the study, advice of my thesis committee and the literature review assisted with question development.

Two women who met the criteria were interviewed as a pilot test for the interview process. Revisions of the interview guide such as an expansion of the demographic information, were addressed at this time (Lo Biondo-Wood & Haber, 1994; Sorrell & Redmond, 1995). Each interview began with an explanation of the study followed by a discussion of any questions or concerns. Participants were asked to sign a consent form (Appendix J). The tape-recorded interview followed the completion of the aforementioned tasks. All but one interview took place in the participant's homes.

Data Analysis

Qualitative research generates an abundance of data that must often be simultaneously organized, synthesized and analyzed (Fetterman, 1989; Polit & Hungler, 1995). As described, semi-structured, open-ended questions in an interview format with pregnant women provided the data for the study. Thematic content analysis, an valued method for analysing qualitative data, was the method used for this investigation. Content analysis is well suited to research investigating a broad range of notions or ideas. Polit and Hungler (1995) suggest content analysis is typically applied in qualitative investigations which ask the "what" questions.

Transcripts of each interview were made which were known as the "raw" data for analysis. The raw data were then proof read against the audio-taped interviews, providing a general sense of each interview (Sandelowski, 1995). Burnard (1991) describes the aim

of content analysis as a method "to produce a detailed and systematic recording of the themes and issues addressed in the interviews and to link the themes and interviews together under a reasonably exhaustive category system" (p.461). Polit and Hungler (1995) contend these themes embody ideas or concepts giving them patterns of meaning which yield valuable insights. The categories determined by the investigator represented a precise description of the content characteristics.

There are a variety of techniques which can be used to get into the data. Whatever technique is selected must be clear and consistently applied to the raw data (Polit & Hungler, 1995; Sandelowski, 1995). The basic technique for the analysis of this study was one Wilson (1989) collectively refers to as analytic description. It includes the following three steps: a) deciding on the unit of analysis; b) developing a category system for classifying units of content; and c) developing a rationale to guide coding of the data into categories.

Through a process of open-coding, the raw data were read line by line repeatedly to enable "feeling" for essential features. Single words were used as the unit of analysis and referred to as codes. The codes may describe a line, sentence or an entire paragraph. Categories were developed by pulling the "units of meaning" or codes together. A list of categories and possibly sub-categories emerged. It was important to define the categories as clearly as possible. Examples of the raw data helped to illustrate the description of each code which is reflected in the category (Sandelowski, 1994). In other words, there was rationale for each piece of data as to why it fits in a particular category (Wilson, 1989).

Reduction was necessary to help collapse the many categories which commonly result

from this method of analysis. Categories were carefully compared and clustered. Relationships between the categories was established resulting in content "themes." These themes, in essence, summarized the meaning of the data which answered the research questions.

Trustworthiness

The most controversial issue that researchers face when applying qualitative methods to the process of scientific investigation has been concern surrounding the value or trustworthiness of the research findings (Appleton, 1995; Bailey, 1997; Sandelowski, 1986, 1993). The term trustworthiness is a collective term applied to qualitative research for the conventional criteria typically used for judging the rigor of scientific research namely internal validity, external validity, reliability, and objectivity (Guba & Lincoln, 1989).

Bailey (1997) has suggested "that the transfer of credibility criterion, validity and reliability, from the positivist to the interpretative paradigm is not automatic or even reasonable" (p. 21). Therefore, some qualitative researchers have reconceptualized the issue of quality and for them, "the value of authenticity of qualitative research findings is determined through a process of validation" (Bailey, 1997, p.21). These researchers now speak of truth value, applicability, consistency and neutrality as a means of ensuring rigor to qualitative studies (Appleton, 1995; Bailey, 1997; Guba & Lincoln, 1989; Sandelowski, 1986, 1993). These criteria were used in this study to ensure reliability and validity.

Appleton (1995) suggests "true value" of a qualitative study or its credibility is the extent to which it establishes the reality or truth of a given inquiry. Scientific researchers would address this as internal validity. Credibility is said to be present if participants can recognize their own experiences through the descriptions of the data (Appleton, 1995; Guba & Lincoln, 1989; Sandelowski, 1986, 1993).

There are a number of strategies used in qualitative research to facilitate true value or credibility but the single must crucial technique is "member checks" (Guba & Lincoln, 1989). It should occur continuously throughout the research period including both during data collection and analysis (Guba & Lincoln, 1989; Sandelowski, 1993). This technique was employed in this study.

Member checking simply means verification of given data with study participants. It allows the investigator to assess what participants or members intended with their comments. It gives participants an opportunity to correct what they have said, it provides participants a chance to add more information, it allows for participants and the investigator to verify meaning of their statements and it allows for an opportunity for the participant to hear the investigator's summary and judgement of their statement (Guba & Lincoln, 1989; Sandelowski, 1986).

Member checks in this study were informal. Periodically throughout the interview with each participant, the investigator reviewed their statements to see if the true meaning of their feelings has been captured in their comments. Field notes were kept following each interview. This activity provided the investigator with an opportunity to have reflection or a time to examine personal feelings, evaluate the effectiveness of the research

questions and highlight any outstanding features of the participants' responses.

Positivists describe the "generalizability" of the research findings as external validity. Naturalistic or qualitative researchers describe this criterion as applicability or sometimes transferability (Appleton, 1995; Guba & Lincoln, 1989). Appleton (1995) refers to applicability as "fittingness" or how well the findings fit with the contexts of others outside the given research.

Sandelowski (1986) warns of two threats to the applicability of qualitative research: elite bias when favouritism is shown toward articulate participants and holistic fallacy when the investigator feels overly confident with his/her conclusions. Several authors describe strategies to avoid these threats and ensure applicability. These are the provision of "thick" or detailed descriptions of the research data and repetitive review of interview manuscripts when developing themes (Appleton, 1995; Guba & Lincoln, 1989). The investigator applied both strategies during data analysis and presentation of the findings.

Consistency or dependability is the third criterion of qualitative rigor and it parallels reliability in conventional research. When a study is questioned about its consistency, the most common question asked is how stable are the findings? Guba and Lincoln (1989) recommend investigators use an audit process or decision trail from beginning to end whereby a reader can clearly follow the trial of data interpretations. Appleton (1995) also recommends the use of tape-recorded interviews and pilot testing to increase the reliability of the research findings. Both strategies were utilized by this investigator.

Finally, neutrality or confirmability is thought of as parallel to the conventional criterion of objectivity (Appleton, 1995; Guba & Lincoln, 1989; Sandelowski, 1986).

Guba and Lincoln (1989) suggest neutrality is "concerned with assuring that data, interpretations, and outcomes of inquiries are rooted in contexts and persons apart from the evaluator and are not simply fragments of the evaluator's imagination" (p. 243). Sandelowski (1986) suggests the use of a decision trail to achieve objectivity.

Bias is defined as any influence that produces a distortion in the results of a study (Polit & Hungler, 1995). Since we can probably never be absolutely free of bias, and in an effort to reduce the possibility of bias as much as possible, several characteristics of qualitative research need to be acknowledged. The fact that the investigator is an integral part of the research process and therefore, crucial to the findings, researchers must make their value system clear at the outset and acknowledge their subjectivity (Hanson, 1994). In addition, when conducting qualitative research, the investigator is frequently familiar with either the research setting and or participants of the study. This investigator, being a clinical practitioner of sonography, a midwife with an inherent belief that pregnancy is a normal, physiological event in a woman's life and a supporter of feminist philosophy, does bring potential bias to the research. The investigator may influence the direction of interviews in subtle ways with leading questions.

Nevertheless, prior recognition of these characteristics can help control potential bias. An additional strategy to ensure bias control was regular counsel with my thesis chair. This exercise acted like a debriefing in which the chair challenged the investigator to ensure credibility of the research process and findings.

Ethical Considerations

This research proposal received ethics approval from the Faculty of Nursing Ethical Review Committee at the University of Manitoba prior to data collection (Appendix K). All participants who agreed to participate gave verbal consent prior to giving written consent. Every attempt was made to ensure each participant received an informed consent and that her rights as a study informant were protected. Women were informed that their participation was voluntary and that they could withdraw at any time during the process and that they could refuse to answer any question.

Potential participants received a verbal explanation of the study when contacted by the investigator via telephone and then a written explanation when they met to conduct the interview. Issues related to confidentiality and anonymity were discussed. Participants were assigned a pseudonym; their names never appeared on any of the transcripts or in any written version of this study. Transcripts and audio-tapes will be stored in a locked drawer. Data generated by this study will be kept secure for at least seven years; participants were informed of this fact. Access to the audio-tapes and transcripts was restricted to the investigator and her thesis advisor. Participants were also given the opportunity to receive a written summary of the study findings.

A request to approach potential research participants was made with the urban health care centre selected for this study. A copy of the ethics approval for the study was submitted to the appropriate personnel for formal approval of participant access and release of a potential participant's telephone number. This was done after the investigator had received ethics approval from the university.

At any time during the interview if a participant became uncomfortable with the process, they could request the interview be stopped and a discussion on how to proceed ensued. If concerns about a woman's experience with an obstetrical sonography created tension or discomfort, the investigator encouraged the participant to verbalize her concerns. If the investigator observed that further counsel was required to resolve this concern, a recommendation of this nature was to be made, following participants consent, with their referring medical practitioner. None of the participants in this study demonstrated any of these concern.

Summary

This chapter has described the methods used to conduct a qualitative study examining the attitudes of women toward the use of real-time high resolution sonography in pregnancy. The strategies of conducting semi-structured interviews and thematic content analysis are well suited for an inquiry of this nature and were applied in this investigation.

CHAPTER FOUR

Presentation of Findings

The findings of this research are presented in the following chapter. First, biographical information about the participants is summarized. Second, the attitudes of the participants toward routine prenatal sonography are described through five themes that emerged during thematic content analysis. The five themes are: a) "In Anticipation;" b) "The Imaging Experience;" c) "The Importance of Knowing;" d) "The Next Time;" and e) "The Ethics of It All."

Biographical Information

Twenty women participated in this study. At the time of the interviews, they ranged in age from 24 to 38 years, with an average age of 29.5 years. Five were pregnant for the first time and the remaining 15 were experiencing a pregnancy for the second or third time. Five women had experienced a loss in either the first or second trimester of a previous pregnancy. One participant revealed a termination of pregnancy in the past. All were pregnant at the time of their interview, had received at least one ultrasound in the current pregnancy and were aware of the ultrasound findings. Fourteen of the participants had experienced one or more ultrasounds with past pregnancies for a total of 57 ultrasounds, including fetal assessments in a total of 41 pregnancies. This represents an average of 1.39 ultrasounds per pregnancy, which is not consistent with the Manitoba provincial average of 2.56 ultrasounds per pregnancy (Tudiver, 1993). It was anticipated

there would be additional sonography conducted for the current pregnancies in either the form of a diagnostic scan or a fetal assessment.

Eighteen of the participants were married, with two being single at the time of the interview. One woman reported one of three pregnancies was planned, another reported neither of two pregnancies was planned while all other pregnancies were reportedly planned. Four participants stated they were homemakers while the remaining 16 worked in part-time or full-time positions outside the home. All study participants had at least a grade twelve education, two had community college diplomas and 12 had one or more baccalaureate degrees. Occupations of those working outside the home included: federal government analyst, educator, registered nurse, physiotherapist, drug addictions counselor, laboratory technician, day care worker, finance coordinator, store manager, social worker, occupational therapist, business manager, corrections officer and industry worker.

All participants stated English as their first language with some being fluent in French, German, Dutch, Spanish and Polish. In addition, all participants but one, who was born in the United States of America, had been born in Canada. Ethnicity of the participants was described as British, French Canadian, Metis, Native, German, Polish, Mennonite, East Indian and Ukrainian.

In summary, the 20 participants of this study were well educated, mature women who provided extensive narratives of their attitudes toward the use of sonography in pregnancy. Through feminist inquiry, the "lived experiences" of the women in this study, supplied rich data for the purpose of potentially identifying some answers for the

appropriate use of reproductive technology and in particular, routine prenatal sonography. The intent of this inquiry was to build knowledge that will augment the health care of women during two of the most critical periods in their lives, pregnancy and giving birth.

In Anticipation

In the book Technopoly, Neil Postman (1993) suggests that technology, for better or worse, is an integral part of western culture and has become totally entrenched in all avenues of every day living. Technology has undoubtedly reshaped how we offer and administer health care, with particular impact on events at the beginning and end of life. The participants of this study were well aware of the use of ultrasound in pregnancy and, in fact, many thought it to be part of "routine" prenatal care. The responses to interview questions were shaped by each individual character, by personal experiences of their own or others and by a set of personal values.

During each interview, participants were asked who suggested having an ultrasound, why they had been sent for one, if they wanted one and whether they clearly understood the need for having an ultrasound. Responses to these inquiries revealed a number of activities and processes women either applied, incorporated or felt about their ultrasound experience. The overall theme that emerged from these responses was how women "prepare" themselves for this type of prenatal testing. The title for this theme is "In Anticipation." It has been formulated by a number of subcategories that indicates some of the "preparation" women engage in prior to a prenatal sonogram.

Understanding of the Ultrasound Referral

All the participants offered an opinion as to why they had been sent for prenatal sonography. Seventeen of the 20 study participants wanted an ultrasound and the reason most frequently cited was for "reassurance." This desire of achieving "reassurance" from this type of testing was voiced throughout the narratives. Wanda, pregnant for the third time, described the need for reassurance by stating: "I would want it to be routine and you know, that's why I had asked my doctor if I could get one done because even though she said everything was fine, I just, you know wanted that reassurance again that it was."

Some of the reasons for wanting a scan included a family history of twins and client assumption a scan in pregnancy was routine. Others had experienced vaginal bleeding which was worrisome and six women had unsure dates and knew it was important to establish an expected day of delivery. One participant felt it was "harmless" technology which would provide important information, one had a previous ultrasound which had been a positive experience so wanted another scan and one had declined a genetic amniocentesis therefore wanted an ultrasound for a second opinion. Curiosity was the reason given by one participant, several noted it was to relieve their anxiety and one wanted an ultrasound so her husband could connect better with the baby.

Three participants agreed to attend for an ultrasound when it was recommended by their attending physician as they felt the referrals were legitimate and they respected the opinion of the physician. All participants therefore went willingly for this type of prenatal testing but some could not clearly articulate why they felt it to be important. Julia made this simple statement: "Because anything could go wrong, there could be a medical thing

there." Ten of the participants revealed a good understanding of why they were having an ultrasound and the benefits it might provide them. Sonographic information that would establish the expected date of confinement was foremost in the narratives of six women.

Routine Sonography

Closely linked to the discussion of reasons for referral were attitudes related to the use of ultrasound as a routine test in pregnancy. Three participants expressed similar feelings why ultrasound should not be routine practice. They felt ultrasound was a valuable tool if a risk and/or problem had been identified with the pregnancy but suggested the health care system probably could not afford routine testing. Donna offered the following reasons for not supporting routine sonography: "I suppose the main issue is the cost. I don't believe the technology should be used just like, just because somebody wants to know the sex of their baby because they want to decorate the room appropriately."

Four participants stated ultrasound should be routine practice and, in fact, one felt it should be mandatory if there was a problem. Reasons given for routine testing included: an effective way to screen for potential problems; if something is wrong this allows for preparation and adjustment; it makes the pregnancy more tangible and gives one peace of mind.

Eight participants either thought ultrasound was routine testing or they assumed it to be because so many women went for one. Five participants felt women should be given the choice to go even if a medical reason was not evident. Margaret explained this idea by suggesting:

> I think a lot of problems maybe aren't detected.
> A pregnancy can look normal and everything can
> be going fine and the mother can be feeling fine but
> there still might be some kind of problem. And it
> would be nice just to know, to prepare yourself
> ahead of time

Confidence and Reasoning

Some of the study participants displayed a level of trust and confidence with their attending physician when a prenatal sonogram was recommended. Connie voiced her trust with this remark: "I probably have a comfort level if my doctor says it is a safe or reasonably safe procedure that it is okay because of her approach to everything else."

Whether an ultrasound was wanted by the participant or suggested by their physician, several spoke of how they reasoned or came to a decision about having this test. Strategies employed to reason the referral included gathering information from a variety of sources, justification of the referral and exploration of all prenatal testing options. Donna justified having her ultrasound by stating:

> I guess I sort of felt that I'm entitled to it.
> And I sort of feel it is relatively harmless
> technology that could add information that
> might make it better for myself and my baby.
> Whatever they might find out we'd have some time then.

"Worry"

The idea of "worry" or a variant of this feeling was voiced in the narratives of 12 participants. Some stated they had general worries such as "was the baby healthy" or "was she eating properly." Two women were concerned they might be having twins. Another worried she would develop gestational diabetes as with her first pregnancy. One participant said she "was scared" and "could not wait to get to the magical number nine

weeks." Others worried something might be wrong; for example, one participant was older and the other had an ovarian cyst that was being closely monitored. One participant feared having to have her labour induced as with her previous baby.

There was, however, one significant worry expressed by several women and it related to either a previous loss or vaginal bleeding. Experiencing either or both of these occurrences appeared to have a profound impact for these women on how they felt about their present pregnancy and the need for ultrasound. These participants clearly expressed worry or anxiety and wanted "this test" for reassurance. One participant, because of vaginal bleeding, was demanding serial sonography throughout her pregnancy. Tamara, who had a previous loss at approximately 12 weeks gestation, described her anxiety with the following comments:

> Oh, it was horrible not knowing, like cause not being able to feel movement at that time, so you don't know if the baby is growing and if your body actually can grow a baby after the first time your baby doesn't form, so you wonder if your baby's actually growing inside you. The anxiety was horrible for that.

Several participants revealed they had some concern about pregnancy outcomes in relationship to their family history. Tanis expressed this concern by stating: "My cousin on my father's side has Down Syndrome. Like I think about it, but whatever happens, happens kind of thing and so I try not to worry about it. But I try not to think about it."

Awareness of the Technology

Participants were asked how long they had been aware of the use of ultrasound in obstetrics and who or what had been the source of that knowledge. Karen, who was 38 years old at the time of her interview, thought she remembered as far back as 20 years.

Ultrasound was, of course, being used in obstetrics at that time however, not to the extent it is today. On average the length of time for awareness was 12 years. Some of the participants said friends had been their source, others said family members and, in particular, a sister. Ten women said either general reading material such as prenatal books or television had been a source of information. Some participants stated they knew about ultrasound from a combination of the stated sources. Nicole said, " well I recall a girlfriend getting pregnant a number of years ago and seeing a picture from the ultrasound. And that was certainly more then five years ago, likely closer to nine years." Donna suggested her source was probably family, "it might have been my sisters who all had children before I did."

In summary, from the narratives and without exception, all the women in this study had a degree of awareness that ultrasound was used in pregnancy. They did not, however, all clearly articulate the potential benefits of this technology nor why it was ordered in some circumstances and not in others. Worry about the pregnancy was expressed by many of the participants and in particular if there had been a previous loss or bleeding in pregnancy. Women want reassurance and feel sonography will provide them with such. Women also appear to use mechanisms of reasoning for either wanting or requesting an ultrasound. Trust in their physicians sufficed for some of the participants when the need of this type of prenatal testing was suggested. The actual experience will be described in the following text.

The Imaging Experience

Participants were asked to talk about the actual experience of having their recent ultrasound. They voiced detailed aspects about what had happened to them during this recent experience with diagnostic medical imaging. Similarities and differences of the experience were identified. Some were pleased with the experience while others were frustrated and disappointed. Expectations, past experiences and prior information were influential factors in determining how participants thought or felt about the experience. Several subcategories formed this theme which has been entitled "The Imaging Experience."

Waiting

The waiting period for a prenatal sonogram varies across Canada. The major reasons for this are limited resources or the excessive number of requests for diagnostic medical imaging. Currently in Manitoba, most women will wait approximately eight to ten weeks for a "routine" prenatal scan.

Mixed feelings were reported about the time each had to wait for their scan, some waited only days while others waited up to ten weeks. Eleven women had to wait at least eight to ten weeks before going for the appointment. Words like "anxious;" "apprehensive;" "nervous;" and "scared" were used to describe their feelings about waiting and then again some expected a wait from what they knew about the experiences of other women. Tanis, who waited ten weeks for her scan, was quite explicit about her feelings:

> Well I was getting ticked off. I wanted it, I wanted to know when my due date was for one thing, because I was just measuring a lot more. I thought that if there was something wrong, they could catch it earlier. I don't know. I just thought there was too long of a wait in between or to get one.

Expectations

All participants voiced their expectations about the information they would receive during the ultrasound and the role of the sonographer. Achieving those expectations no doubt influenced how each viewed the technology, information they were or were not given and how they felt about the experience. The participants framed their expectations in a variety of statements.

Debbie stated she hoped, "the scan would give me a clear picture of the baby and its status." Debbie and others were also wanting to find out, "the baby's sex and if there were any complications." Shauna was keen to know, "how many there were, measurements, age of baby and determine any health problems." Donna wanted to know "if the baby was alive and healthy and developing as it should be." Carol thought they "would measure the bones and check whether everything's there." Donna also "expected the tech to say who she was, what her role was and explain as she went along." Tanis was hoping "to view the exam much longer than 5 minutes." Rebecca thought "her report would contain far more information than it did." Nicole summed up her expectations by stating: "I expected to be with someone who could actually answer my questions and I'm feeling a little frustrated by that."

Physical Environment and Preparation

Attitudes about the physical preparation recommended for an ultrasound and the physical environment where the test took place produced some lively discussions. Hospital policy dictated how they were prepared; all changed from their own clothing into a hospital gown. Two participants found this practice left them feeling "a little vulnerable" while the others did not mind. The need to have a full bladder was commented on by all the participants. Some used descriptive words such as "horrible," "agonizing" and "dreadful" to relate their discomfort with this practice and others stated they did not experience a problem with the practice. The application of sonographic jell to their abdomens was also commented on: some said it was cold and others noted it had been warm.

Numerous words were used to describe the actual examining room. Positive words such as "quiet and calm;" "felt privacy;" "comfortable;" "inviting;" "relaxing;" and "peaceful" were expressed by some, while others used words such as "cold;" "institutional;" "noisy;" and "heard other voices." Others commented on the fact that in this particular facility, examinations did not take place in private rooms, rather they were in a large room with curtains between patients. For some this lack of privacy produced a feeling of vulnerability.

Interaction and Feedback from Sonographer (Technician)

The importance of interaction between the sonographer and the participant was evident in the narratives. This exchange also appeared to influence some of the attitudes the women described. In addition, the first impression often set the tone for the entire

examination. All participants stated the sonographer introduced herself/himself prior to starting the exam. Over half of the participants said the sonographer explained what she/he would be doing before the examination was started and on seven occasions she/he stated what their role would be during the exam. Sixteen participants said they felt respected during their ultrasound experience and four made no comment.

These first impressions were significant as the participants used them to frame their advice for others or to prepare themselves for additional exams. Janice had two ultrasounds and felt quite differently about each. She noted the first one was a "positive experience" and she felt "comfortable" with the sonographer. Janice hoped to get the same sonographer with her second scan, however, she did not and described this sonographer as "clinical." Shelly expressed her feelings by stating: "like they weren't rude or anything. But you weren't shown the golden carpet treatment or anything like that."

Sonographic Impressions

Participants related vivid descriptions of their impressions of the actual sonographic images or visualization, reactions to seeing their baby on the ultrasound monitor and feelings about the experience of having an ultrasound while pregnant. All participants were able to "visualize" or picture some aspect of the baby. Bony fetal structures followed by fetal cardiac movement were the structures most often clearly visualized. Tanis eagerly stated: " I saw everything she showed me. I knew what it was. I saw the heart, the spine, the head and the legs."

Several participants noted the ultrasound images looked "alien." Carol described her feelings by stating: " I didn't like the face at all. It looked like something from Halloween."

Some women said they could "sort of" see the fetal images as they were being pointed out during the scan. Nicole said, "it took me a minute to get my bearings because you look at the screen and it is hard to imagine how anyone can realize the image is a head." All participants admitted to being able to visualize "something" on the monitor.

Nevertheless without exception, each participant described her feelings about seeing her baby on the ultrasound monitor with a "positive" word or phrase. Some used the word "bonding" and others suggested the word "neat" when asked about this reaction. One said, "I was happy to see life growing inside of me," while some specifically used the term "reassuring" which was a word voiced repetitively throughout the interviews. Others used words such as "thrilled;" "happy;" "excited;" "relief;" "hopeful;" "healthy;" "connected;" "attachment;" "wonderful;" "great experience;" "incredible;" and "sweet." Several participants said this visual experience helped to establish the reality of being pregnant.

For some women, their sonographic experience had profound meaning. One participant voiced a particularly poignant comment about her reaction to seeing her baby on ultrasound. Julia stated:

> When I found out that I was pregnant, the father of the baby wanted me to get an abortion. I didn't want to, it is against my morals and I didn't go through the abortion. By the time I was given the ultrasound I was having second thoughts because he left, so that left me raising a third kid on my own and I didn't want to go through that, but as soon as I saw the baby on the screen it was a totally different story. I was happy.

Support Person and Hospital Policies

Discussions related to the presence of partners or a support person during the examination revealed some provocative attitudes from study participants. Whether or not a patient can have someone with them for an entire or partial ultrasound exam is based on the individual medical facility practices and policies. Typical practice is to invite the support person into the examining room following the formal medical aspect of the scan. This was the practice at the centre where study participants were recruited.

It appeared important for these study participants to have someone with them during the scan and preferably for the entire exam. While some women were simply compliant with hospital policies, others were frustrated with the exclusion of their partners at a time when they desperately needed them for support and to share the "imaging" experience.

Over half of the women stated they would have preferred their partner present for the entire exam. They wanted them "for support;" "to share the experience;" "to get better connected with the baby." Some had "expectations" he would be present the whole time. Donna wanted her partner present just in case there was " bad news."

Debbie, who had an ultrasound with a vaginal probe, encountered a "hospital policy" which did not allow her partner present for any portion of this type of sonographic examination. She was particularly distressed about this policy, as her husband had taken time off work so he could be with her to offer support. Debbie challenged the sonographer on the policy but no exception was made. She exclaimed:

> I definitely wanted him. I don't think there
> is any reason why, I mean not at all. He's going
> to know those results almost as you are because

> you are going to call him. So for him not to be there to see all that I think is foolishness. He is your number one comfort.

A small number of participants suggested it did not matter to them whether or not their partners were there and one did not have a partner but elected to have a support person with her. In one situation, the participant requested her sister, who was a nurse, be present while a vaginal ultrasound was being done and this request was granted.

Several participants related how their partners felt about the experience. Denise said her partner " really liked it." Janice said her partner seemed "to bond" more with the baby after the test and talk to it more than before. Lynne noted her partner was anxious to be present for the "whole time." He too went with some expectations of his own, like finding out the due date, and thought "the tech went too fast." Margaret and Louise said their partners were "disappointed" not to be present for the entire scan and felt "cheated" with limited viewing time.

New Age Requests: Photographs and Video-Taping

Another policy that appeared to frustrate and even irritate some participants was not being allowed to video-tape their exam or not being able to receive a photograph(s) of their baby or some other feature of the scan. In general, most Canadian diagnostic imaging units do not provide this type of service including the centre where the study participants were recruited.

The idea of getting a photograph(s) or video of the ultrasound exam was highlighted by over half of the participants. Some of the participants had received photos with previous scans done in Ontario and Britain. Reasons for wanting this type of keepsake

varied, one woman said it would be "important" and another said it would be a "nice gesture." Tanis said a photo was important for the "memories" and for the "baby book." Some participants suggested they would be willing to pay for photos.

Janice, who was from Ontario, was extremely irritated with the no photo policy. She exclaimed:

> We actually took a video-tape with us, but they told us that we're not allowed to have the video-tape or a picture and I really wanted that. I was contemplating at one point maybe we should hunt around the city for a hospital that does do that.

Influences on Attitudes

It was anticipated a variety of influences, such as ethnicity, religious beliefs, social class and education, might help to shape one's attitude(s) to medical technology and prenatal diagnosis. Analysis of the narratives, possibly in relationship to a type of influence, revealed compelling views and feelings these women had about therapeutic abortions. Eleven women spoke freely about abortion with three clearly stating their "cultural influences" made them anti-abortion.

Connie said she was raised to believe in "authoritarian" figures, thus she did not always question people in "so called authority position such as doctors." She also stated, "being Canadian, we believe in technology, technology reigns." Denise said she would never take drugs during her pregnancy and in fact, taking antibiotics for a vaginal infection had bothered her. Tanis said because her sisters reported "positive" experiences when they had obstetrical sonography, she went to her ultrasound with this attitude in mind and was excited about going.

Ultrasound and Lifestyle Influences

Participants were asked if having an ultrasound in their pregnancy changed any aspect of their lifestyle or habits that could possibly have a negative effect on their bodies or babies? Ten women had already made some changes because they were pregnant and not because of the ultrasound. Some of those changes included: increase in milk consumption; diet changes; more exercise; reduction of caffeine intake; ceased consumption of alcohol; resting more; and reduced exposure to smokers.

Several participants suggested that seeing their baby on the ultrasound acted as a change agent for some of their lifestyle activities. These included: taking better care of oneself; reduction of caffeine intake; taking vitamins more regularly; having more breaks at work; being more careful at work; being more cautious, and decreasing heavy tasks. Julia, who was the only smoker of all the participants, said she had tried to cut down on her smoking. Six participants said they had made no changes to their lifestyle and/or habits since becoming pregnant.

Fetal Movements

Fetal movements are viewed as a significant clinical marker in pregnancy for both the mother and health care practitioner. Some of the participants identified themselves as being more connected to their babies because of movements rather than a period of sonographic visualization. Margaret said, "fetal movements were more significant because they are there all day long whereas the ultrasound you see only once." Rebecca described the movements as "reassuring" and "you know the baby is alive and developing."

Tamara perceived fetal movements to be " just wonderful" and "they were the best thing happening in the world."

Some reported that the experience of having an ultrasound made more of an impact than fetal movements. Carol said, "I didn't like the baby moving because it felt like something there that did not belong and I had dreams that felt like the baby was trying to get out." This reaction made Carol enjoy the scan more so than the movements. Lynne suggested the ultrasound, "put me at ease more than the movements."

Feeling Toward the "Big" Picture

Overall, the majority of the participants described the "experience" of having an ultrasound in their pregnancy as basically a "good" or "positive" experience. This appeared to be closely linked to how they felt about "seeing" their baby on the monitor and the experience in general. Once again the most frequently used word to describe their feelings was "reassurance."

Debbie, while being frustrated about not having her partner present for the scan, did feel "good" about the experience and in particular the positive information she received. She said:

> I felt a 100% when I left there. I saw the heartbeat even though it was a week younger, that kind of stumped me. So it was a positive experience where I was able to problem solve my worries and like get an answer for the questions that I had in my mind. All these things went through my mind but I felt really good coming out of there thinking that it is a perfectly formed fetus, it has a heartbeat, everything looked good and the womb looked good. She said the ovaries they looked good, so all those things it allayed a lot of fears.

Karen said, "the ultrasound was sort of an extra reassurance," as they had declined any other invasive prenatal testing in view of her advanced maternal age. Rebecca noted: "The ultrasound made it even more reassuring because we actually could see the baby so it made it more realistic." Shelly said, " I enjoyed having it and would definitely with future pregnancies have another one". Tamara found it reassuring but was still tentative as she explained: " Like it did put my mind at ease then but you still always have the constant worry if everything is there."

As previously noted, practice at the recruiting center was to conduct the entire sonogram then invite the partner or support person into the room and have both observe the monitor as limited sonographic images were explained. Four participants verbalized that they would have preferred observing the monitor throughout the entire examination. Margaret described her feelings by saying:

> I wouldn't have minded knowing more, like as she was doing things and being able to see, like I was kind of irritated when I realized there was a screen behind me that she could have pulled in the front that I could have been watching while I was lying there. So it would have been nice to know, like as she's doing it, to say I'm measuring this now.

In summary, the participants generally described their ultrasound experience on a positive note. Some of their expectations were met and others were not. They felt respected during their visit to the ultrasound department, however, some did describe the environment as cold and clinical. There were mixed reviews about the actual physical preparation and, in particular, the intake of water for bladder filling. "To see" their babies on the ultrasound monitor was perhaps the most reassuring aspect of the visit but

provision of information in conjunction with the images proved to be an issue that provoked much discussion and will be described in the following section.

The Importance of Knowing

Knowledge means different things to different individuals. While some participants did not come right out and ask for specific information during the scan, there was an emphasis on finding out some "knowledge" of what was happening during the actual examination. Since the desire to have an ultrasound for reassurance was foremost in the minds of many of these study participants, the provision "of information" was key to their ability to achieve a level "of knowing" and to feel reassured. This theme was probably the most compelling of the study and has been described as "The Importance of Knowing."

Feedback and Findings

An influential factor in determining how participants viewed their sonographic experience related to this desire to receive "information" or feedback during the scan. As described, a brief review of the images is given to the woman and her partner or support person(s) at the conclusion of the scan. The sonographic images on permanent copy are reviewed by a sonologist and a report of the findings is sent to the attending physician who in turn informs the patient of the findings via the report. Thus it may be some time before the patient is actually informed of her ultrasound findings.

Eight of eleven study participants who expressed a view about this waiting period found it to be an "anxious" time. Janice, who had experienced vaginal bleeding in this pregnancy, described her feelings about waiting for the results of a second scan:

> I'm still waiting for it, I mean I call almost every day to find out if they've gotten the results. I'm irritating but I basically call everyday. So I'm really scared and I'm dying to find out what's going on. I'm not even thinking about the next one, I just want to find out what the last one said. I'm finding I'm on pins and needles this whole pregnancy.

Louise, who was anxious to know the gestational age of her baby because her dates were so uncertain, expressed similar feelings about waiting with this remark: "She said the doctor should have the results in her possession by my next doctor appointment. I was anxious to find out and I thought when I went to my doctor I would find them out, then still nothing." Tanis, who waited eight to ten weeks for her appointment was more proactive while she waited for her results:

> I went in on a Friday. She said to phone your doctor by probably Friday. She might have something, she didn't say for sure. Then I phoned on Friday and it wasn't 'til Tuesday that I got results. I was impatient, very impatient, yes I couldn't wait.

Meanwhile some participants were confident about the findings and patiently waited. Shauna, who did not totally agree with having an ultrasound but respected her physician's recommendation to have one done, made these comments:

> It was fine. Like I didn't expect that there would be anything abnormal or I had no problem waiting. I mean I was anticipating hearing the words that everything was fine or whatever but, um, I wasn't anxious or worried. I really didn't think there was any reason to be anxious.

Desired Information

Research has reported women want to know more than they are often told about procedures carried out during pregnancy. Perceived needs, difficulties faced when asking

questions and unsatisfactory answers are only some of the barriers women encounter in their quest for "knowledge." From the narratives, the participants did indeed encounter the aforementioned barriers and most often it was in conjunction with the who, what and where of the "giving of information."

Most often the participants attended for their scan without asking many questions either of their physician or other usual sources of information. Many participants also went into the ultrasound thinking they would receive information or the scan results at the time of the examination. What happened in reality was quite different and most likely influenced their attitudes toward ultrasound.

For some, what they wanted to hear was different from what they were told during the scan and this proved to be a frustrating experience. When asked what information they wanted the most, the following were cited in descending frequency: "knowing the age of the baby to determine an expected day of delivery;" "hearing the baby's heart beat;" "seeing a whole baby;" " to be told the baby was healthy;" " to be told everything was okay;" " to be told if there was something wrong;" and "wanting to know the weight/size of the baby."

Nicole had a number of information "wants" and she expressed them as follows:

> Well, I wanted to confirm the due date, due to like work issues. I actually wanted to know the sex of the baby and they wouldn't tell us. And also to know the overall health, if there was anything that could be seen on an ultrasound that would indicate that there was something, you know, wrong with the baby. I would have wanted to know.

Tamara expressed her desires with the following comments: "Everything. I thought they could tell you everything about your baby, like how it's growing, what's formed. I thought you would get like all the whole low-down on your baby. But they're very secretive I found out."

Some of the participants simply accepted the fact that they would not be receiving any specific information at the time of the scan. Wanda, who had a scan in a previous pregnancy, expressed her feelings by saying:

> Not really, because I knew that they wouldn't be able to give me any information about the ultrasound. The technician just said to me that everything looked good. She did make that comment, you know, everything looked fine which, you know, made me feel good.

In an effort to cope with a lack of information/feedback dispensed during the ultrasound examination, three participants stated they "watched" the face of the sonographer to see if they could "read" or discern any information from facial expressions. Wanda offered these words in support of her feelings: " I know with my second one that I had gone to, that technician, she was really quiet and you know you sort of sit and look at their face and look for any type of, you know, expression or anything."

Role of the Sonographer and Information

The women in this study provided numerous examples of how they attempted to obtain "knowledge" or information while the exam was being conducted. Most were informed prior to the scan that the sonographer could not give them any specific information about the findings, rather this would come from their physician once he/she had received the report. This practice relates to the role of the sonographer. Their

professional role is to obtain sonographic images authorized for an obstetrical examination. They are not there to interpret the images nor share that knowledge with the patient. Sonographers often find this "professional limitation" difficult as they are constantly being asked questions. In turn, women and their partners find the practice frustrating as they are anxious "to know" about the findings. Some sonographers do take a degree of latitude with "professional liberty" and inform the patients of isolated findings such as if twins are identified.

Connie, who had a family history of twins, pointed this practice out by stating:

> No, I had asked about that knowing that the response was the usual that the technician is not allowed to give information out in general. But I asked specically, can you tell me if there is one or two fetuses and she said, yes she can tell me that, but that was the only information she would share specifically.

However, Debbie voiced these thoughts on this practice:

> She might not have shared it if it wasn't positive information, like I am not sure, the circumstances could be different because it looked like a healthy fetus, so it might be different if it hadn't been, because what do you say to a person with that news.

Typically during a scan there is limited or "friendly" conversation between the sonographer and patient. This would often result in periods of "silence." For some, this silence was awkward and for others, it was an expectation. Nevertheless, Louise felt "uncomfortable" with the silence and attempted to cope by looking at the face of the sonographer as previously described as a coping mechanism. She cited her experience in this manner:

> Well, you could say that's uncomfortable because, when I was lying there, like you had to face the lady and I knew I said to myself, I shouldn't be looking at her face because she was like looking at her screen and stopping and clicking and taking pictures. It's like, I don't know, kind of, I'm reading her face expressions and I don't even know her to know what her face expressions mean so it was kind of scary, you always think something is wrong.

Usual practice of "sharing information" occurs at the conclusion of the examination, the sonographer will show the parents a fetal heartbeat, some anatomical views (images) of the baby and fetal activity. The participants did appreciate this effort but often they expected or wanted more. The partners, as described by the participant, sometime noted that "it all went too quickly" and "they could not really understand the images."

The participants described their feelings in a variety of ways when they asked questions and could not get answers. The following are samples of their comments: "I was kind of upset;" " no information really bothered me and I left feeling unsatisfied;" and "I spent the time mostly lying there and staring at the ceiling." There was, however, a balance to this "no information policy." Several women described their feelings with these comments: "I did not expect her to give me any information but she did give some; she apologized for the silence, said she was concentrating but I think she was open to questions and we talked with her and she explained some views."

Sources of Information

Participants were asked if they had read any written material related to obstetrical sonography prior to going for their scan. With only one exception, Donna who had received information while in another country, none of the study participants received

written material specifically related to sonography from their doctor, the ultrasound department or any other source. While some had referred to general information in prenatal books, none had accessed the Internet to obtain information; a popular mode of collecting information in this technological age.

Several participants relied on past sonographic experience to assist them through the current scan. These women did, however, suggest prior to their first ultrasound experience, they would have appreciated reading some information. Two participants noted their educational background probably assisted them with their understanding of the technology and scan findings. One was a Physiotherapist and the other had a Baccalaureate of Science in Agriculture with a major in embryology.

All participants said they would have read written material if made available prior to the scan and thought the provision of such material was a good idea and important. They valued written information for a variety of reasons. Some felt it was nice to know the advantages and disadvantages of the test and reasons why an ultrasound is done. Others thought written material would tell them things they did not know like the safety of ultrasound and one wanted to know when and why vaginal probes are used. Some felt written material would give the "facts" about ultrasound. One participant said, "it would be helpful because you can take it home and verify the facts again and again." Another suggested, "written material would enable women to be more informed and that is positive."

Several said they would have read "something" because they like to know what is going on. A few felt written material would be helpful since the sonographers did not

explain much during the scan. One participant said she actually looked for pamphlets in the waiting area as it "would be like a type of education." Another said it would be nice to read before hand to know what to expect. One thought the information would have "to be written in terms the average woman can understand." And finally, some noted written material could explain the actual procedure and the type of information ultrasound may detect. One participant noted it would be the responsibility of the patient to read the material.

Tanis explained her feelings about written material in this statement:

> Yes, I would have read it over, you know, if they weren't going to explain to me. Probably if I knew the ultrasound was going to be the way it was, I would have wanted information. Then I would know what I was going to be going through. I thought I would get more explained to me while I was there.

Provision of Ultrasound Findings

Most participants were informed of the ultrasound findings by their attending physician. However, on two occasions results were relayed to the participant by the office receptionist. Often the information was not what the women wanted to hear. Many described the information as brief, non-specific and generalized. Louise made this comment: " I was told the baby's position, everything looked fine and I was in my 28th week and that was pretty well it." Tamara and Sheila were simply told, "basically everything looks okay."

Several women spoke of "stories" they had heard which produced some doubts and/or questions in their own mind about prenatal testing and the use of sonography. By not giving them an opportunity to either read written material or have their questions answered before or during the examination, participants appeared to have limited

information with which to make make informed decisions. These "stories" often influenced the experience and their attitudes about the technology. For example, Louise talked of her mother's experience when pregnant. She had an ultrasound following physical abuse and was told the baby would not be normal. Her mother made a decision not to abort and the baby was born normal.

Inherent Risks and Benefits of Information

The participants of this study offered sundry attitudes toward the risks and benefits of having a test done such as prenatal ultrasound. The following are some of their comments about receiving information: "chance that an anomaly would be missed;" "being told there was something wrong and there wasn't;" "being told everything was normal and it was not;" "information may cause worry;" and some suggested they "would not want to know before the baby was born that there was something wrong."

Connie told this particular story about "false" information:

> I think it can be quite devastating. There is this lady up the street who had an amnio and they said things were fine and she had a baby with Down's. She has had a really difficult time accepting that. It took her several months to make the shift. I think that is a false guarantee.

Lynne however, voiced a different notion related to receiving information. She said:

> Mistakes happen all the time and it, nothing is foolproof. And you have to realize that. But I'm sure that, it , mind you they didn't, the results of my ultrasound weren't so definite as to say, you know, your baby will be healthy and will be fine. It's just, you know, things look good at this point.

Fetal Sex

The use of diagnostic medical imaging to solely determine fetal sex is a controversial indication for prenatal sonography. For many, the reasons for knowing are considered inappropriate despite continued consumer pressure to have a scan for this purpose only. The desire to know or not to know the fetal sex was mentioned by 19 study participants. Eleven said they did not want to know the sex of their baby prior to delivery. Given reasons were "it would not make a difference" and they, "wanted a surprise." Others did not want to know "in case there was a mistake" and they "would love their baby no matter what sex it was."

Nine women stated they or their partners were anxious to know fetal sex before birth. Some of the reasons were they "had two girls so really wanted a boy" and "knowing makes it simpler" and "helps with the bonding." Contrary to the group not wanting to know, two in this group were desperate to know because they hated surprises. One participant stated, " we have one child so they were curious to know this one before hand." Those participants who did voice a desire to find the fetal sex before birth often said it was "important" for them to know but could not articulate the meaning of important. Tanis was almost distraught when she was told they were not allowed to disclose that information. She explained:

> I've always wanted to know. I hate surprises, that is my personality. I hate not knowing things. They drive me nuts. But I think it should be your choice if you are willing to not hold the hospital accountable if you, if you are informed that it's not an exact science.

To summarize, the women in this study expressed levels of frustration in achieving their desire to be "informed." Some employed a variety of methods to seek information, but for the majority, they attended for their scan thinking they would receive information (i.e., feedback) at that time. The narratives were filled with passion as the participants revealed what information they "wanted" and what information they actually received. Often their experience was dependent on which sonographer did the exam and what the physician told them.

The time period waiting for the scan results often heightened anxiety levels. Specific information desired by the participants was to know if their baby was "okay" and gestational age. The determination of fetal sex was important for approximately half of the participants. All stated they would have read any written material about sonography prior to the scan had it been available to them. The "importance of knowing" and the value placed on this knowledge were revealed in the narratives despite the possibility of the risks and benefits in knowing. In the following theme, participants expressed their attitudes about having another ultrasound.

The Next Time

There was a natural progression during the course of the interviews to proceed from the actual "experience" and related discussion, to some dialogue about a repeat experience should another ultrasound be ordered. Participants spoke of advice they would give to other women should they be going for an ultrasound. All expressed ideas that had meaning for themselves, the future and any woman who might experience a prenatal sonogram.

They also wanted to share the ultrasound information; this proved to be an important exercise for the participants. The composite theme for these expressions has been entitled "The Next Time."

Information Sharing

All participants were keen to share the "experience" of having an ultrasound and/or the "knowledge" obtained either during the scan or from their doctor when the report was reviewed. This desire or need to share appeared to be an important activity for each study participant. Most often, in addition to the partner if they had not been present for the scan, they discussed the event with a family member and in particular with a mother or sister and/or a girlfriend. They also shared with work colleagues, especially if they were female. Tanis, who was keen to share her "experience", made these remarks: "Oh my husband right away after. Oh, my sisters, I phoned them right away. They all wanted to know that day. And then some girls from work and girlfriends."

Rebecca wanted the whole world to know and these were her comments:

> I told everyone I was having it and then afterwards, um, because most of my friends and my family, they know my history so they were all kind of waiting for the results too, you know, just to be reassured. And so, yes, everybody knew about it.

Ways to Improve Sonographic Experience

When asked how the system might improve on current methods of conducting obstetrical sonography, the women provided numerous suggestions. These responses may indicate a need to review practice(s) and implement change. Some of their suggestions have been presented in preceding text, nevertheless, they are worthy of a second comment

in this context as well. Eight participants thought the lines of communication should be changed. They felt it was important to find out the results of their scan either while it was being conducted or shortly after. In addition, it was suggested this communication needs to be in a language women can understand. Janice made these comments about communication:

> I know with hospital polices and things, like communication with the tech. I really liked the first experience, second one not so much. And the fact that I'm getting the results so late doesn't help so that is tainting my view. Um, the first one I liked, somebody talking to me through the whole thing.

Allowing the partners in for the entire exam was also important for several participants. Nicole voiced this opinion when she spoke of an apparent need for a change in practice:

> I guess I understand the first part of the ultrasound, you know the sort of medical part, but what I don't like about the medical profession is when they stop treating patients like people and sort of, you know, view them as, really I don't want to say objects but in terms of ultrasound, I don't see any reason why my husband couldn't have come with me. I don't see any point in forcing the patient to ask questions when, you know as a tech you're taking pictures and whatever, why you can't be explaining what you're doing as you go without even the patient asking.

Debbie and Nicole both felt the staff needed to be sensitive to the fears, worry and anxiety women often have when they attend for a medical examination. Debbie suggested if one has been sent for a prenatal ultrasound, this is often associated with a concern, therefore, interaction with the patient is vital. The narratives suggest, that interaction was scant or absent during many of the described scanning experiences. And as previously mentioned, some of the women would havepreferred watching the entire scan on the monitor rather than for a limited period at the conclusion of the examination.

Suggestions for changing the physical preparation were made such as having a "warmer" environment, not having to drink so much water and not being required to get undressed and wear a clinical gown. Shelly explained her views about this practice with the following statement:

> Well, I'm thinking I'm not terribly fond of them hospital gowns but on the other hand it's like you have your pants off. You don't want to be wandering around the hospital with no pants on. But why you need to really have your shirt off if you can pull it up high enough is kind of beyond me.

The benefits of receiving written material to read about sonography prior to having a scan was reinforced by some participants. In addition to this suggestion, Karen felt the role of the sonographer needs to change and husbands or a support person of the women's choice should be allowed in for the entire scan if women make this request.

Advice to Others

The participants had some words of advice they wished to pass on to other women who might be having a prenatal ultrasound. Six women noted they would say having a scan is a "positive" experience, that it will be "reassuring;" "do not worry;" or "be scared." Denise said, "it is neat to see your baby on the screen." Six said they would definitely mention having to drink water so their bladders would be full for the test. Others expressed some of the issues around the lack of communication, for example: "it is not like what you see on television;" "suggest they ask for information;" " they may feel left out;" and "the practices around who and when someone can be with you." One participant said she would explain that "ultrasound is an assessment tool" and another would ask if

"they were aware of any risks involving sonography." Donna summed up her advice by saying:

> I think I would probably tell her that she won't be
> able to have her partner with her the whole time.
> Um, and that they won't be able to tell her anything
> That the information just goes straight to the radiologist
> to interpret. Uh, that it's really neat to see the baby.

Ultrasound Testing and Outcome

Analysis of the narratives revealed 14 women felt the outcome of their pregnancy would not be altered as a result of having an ultrasound during pregnancy. These women did express, and rightly so, that the scan is a single observation at one point in time and cannot predict future events. Once again the word "reassurance" was voiced as to why it was important to have a scan. Shelly expressed these words about outcome: "I'm pretty much reassured that yes, it's growing, it's active. But unforeseen little problems like that, you won't know until such a point in time that you hold the baby in your arms."

Valerie continued to have feelings of concern despite having had an ultrasound:

> I mean the test itself cannot change anything.
> It can just show if there are potential problems.
> And I mean, from when I had the ultrasound,
> everything looked fine but as I said, since then I've
> just had some concerns. And I don't know if another
> ultrasound is what I need to check on things or not.

As noted earlier in reference to the reaction these women felt toward seeing their baby on the screen, Julia's experience had a profound impact on her attitude toward her pregnancy. She clearly acknowledged the ultrasound reinforced her decision to not have an abortion. Julia describes her feelings about outcome in this manner:

> I'll be a better Mum though. Well, because about the time I was going on about saying that, ok, maybe I shouldn't have kept it. Maybe I should just have let it go. I'm saying I should have got the abortion and when the baby comes, it should have been an abortion. It doesn't make sense. But seeing the ultrasound changed my mind so I'm obviously not going to be the same as if I would have went through with it, saying I wish I had an abortion.

Repeat Sonography

The idea of having a repeat scan in their current pregnancy was discussed with the participants. Twelve stated they would go back for another scan if there was a medical reason or pregnancy complication. Denise said, "I would say yes but only if there was a reason why and I wouldn't go for another routine one, only if they were worried about something." Nicole felt she would be "more assertive" if there was a repeat scan and ask more questions about why she required another ultrasound:

> I would probably sort of go into some of the questions that I hadn't thought of before the first one. And, you know, which would be like what are the risks of ultrasound, you know more than a one-time exposure.

As a result of having participated in this research project, some of the participants thought of ultrasound in different ways and this was reflected in our conversations about the possibility of another scan. Nicole's previous comment relates to this fact, but Donna described her feelings in this manner: "I suppose I might have questioned it earlier, like you know, sort of have it explained, you know. But that's really more just the result of our discussion. I'd really never given it much thought."

Some participants acknowledged they would have a repeat ultrasound without question. The idea of reassurance surfaced again in the discussions around a repeat scan.

Wanda said she would gladly go again: "I think probably just again for reassurance, just to make sure that everything, you know, is going along smoothly. That everything, you know, all the parts that are being developed if there's a problem."

If having a repeat ultrasound, the women were asked what if anything they would do differently next time. The following are some of their comments: "ask more questions about safety;" " ask to have my husband present for the entire scan;" " be more vocal;" " probably ask about risks;" " ask for more of an explanation;" and "talk with the tech more." Several participants stated they would definitely ask more questions in general. Janice who already knew she was having a repeat scan said, " I would not change anything as we already knew we could not get a picture nor do vide-taping."

Questions for the Investigator

On occasion during the interviews, participants did have questions and certainly this had been an anticipated outcome of the interview process. In addition, at the conclusion of each interview, participants were asked if they had any further questions. And again from the context of their questions, it was felt the interview itself had played a role in the type of questions asked. Debbie expressed her thoughts by asking: "You've kind of gotten me questioning the safety issue of the rays and that's probably the thing I never really considered. How safe are they and are they really needed that often?"

Most participants took advantage of the opportunity to ask questions. The following is a sample of the questions posed to the investigator: "how safe is ultrasound;" " are there any disadvantages to having a scan;" " are there any risks to having a scan;" " can they see if the umbilical cord is around the baby's neck;" " how does the ultrasound work;" " do

you think this study will change any of the hospital policies;" " does the baby feel the actual ultrasound pulses;" " why are you interested in this topic;" and "what is the connection to the ears?" The most frequently asked questions were about any risks involved with scanning and how does ultrasound work. While the interview in of itself may have stimulated some of these questions, it can be ascertained that women appear to enter into medical procedures without the appropriate information as to what they are to experience and why.

To summarize, the aforementioned categories relate some of the attitudes the study participants expressed following a prenatal sonogram. Discussing or sharing the events or knowledge obtained from a sonogram was an important exercise for these women. In addition to their partners, relating the experience with other women appeared to hold special meaning. They offered recommendations as to how the experience of having a scan could be improved and they offered some "pearls of wisdom" for other women who might be going for a prenatal sonogram. Attitudes expressed by the participants toward a repeat ultrasound may have been influenced by the interview process, certainly the study investigator felt this to be the case. The idea that an ultrasound will not likely alter the outcome of their pregnancy was puzzling and conflicted with the earnest desire of the participants to have such a prenatal test as a sonogram.

The Ethics of It All

During the course of our discussions, the participants voiced their attitudes related to prenatal testing. The majority of them did not, however, in the beginning of the

discussions, appear to appreciate that by having an ultrasound in pregnancy, they had entered the world of diagnostic prenatal testing or the possible implications of such testing. The role of sonography as a means of prenatal testing is typically not offered in this context which may account for their responses.

The potential, nevertheless, for sonography to provide such information is indeed evident and warrants the appropriate practice to ensure parents have a clear understanding of the intent of prenatal sonography. Further to being informed, issues related to the risks and safety of using this technology in pregnancy were also explored. The emerging theme was described as "The Ethics of It All."

Informed Consent

All participants were asked to reveal how they gave consent for their scan. None had signed a written consent, in fact none had questioned the matter of giving consent in writing or verbally. All acknowledged they had probably given an "implied" or "verbal" consent for the test either vicariously through their doctor or simply by attending for the appointment. Analysis of the narratives noted there was an apparent lack of information given to the participants prior to testing, during the scan and possibly after as well, making one conclude women are not provided with informed choice(s) in relationship to prenatal diagnosis (PND). Thus there is a question as to whether an "informed" consent (verbal, implied or written) has truly been given for the scan?

Eight participants were "comfortable" with the practice of giving implied consent and four "felt fine" about giving verbal consent. Shauna summed up her feelings by saying: "I did not sign anything. I felt that if I hadn't wanted it and she said, if you want to stop at

any time or don't want this, that's fine." Valerie noted implied consent to be okay because: "they're not you know, doing anything invasive." Carol reasoned her attitude to consent by stating the following:

> If this was something like an amnio where there was a risk to my baby, you know, I'd want to sign a lot of consent forms and get a lot of information but I see the ultrasound as being so low risk and I see it as being such a positive thing, like I get to see my baby you know. I'd like to have one every week. So I guess I don't see ultrasound as a very big deal compared to other test.

Some participants felt they did not receive an "informed consent." Donna described her views with these comments:

> I mean any medical intervention I'm sure has some risks associated with it. And I must say that I went into it really quite blindly in that regard. Um, just of assuming that, well this is something that my, you know, my doctor thinks is good for me so I'll do it. And also because of my previous positive experiences, you know I just sort of went along with it.

Nicole also mentioned the issue of risk in her discussion of giving consent:

> I guess it's fair to say that in my case there was implied consent by virtue of the fact that, you know, I broached the subject with my doctor. Um, but the doctor and the hospital are two entirely different things. What I would liked to have known probably were, are there any risks associated with having an ultrasound and what are they.

Other participants felt that by asking for an ultrasound or the fact that their physician had recommended one, this "implied" they agreed to have an ultrasound and in one instance, the participant felt she had no choice in the matter. Louise said, " I actually never really thought about it. I thought just go there and having the ultrasound was something the doctor required me to do so."

Invasive Prenatal Testing

In talking about invasive prenatal testing, the majority of participants did not appear to appreciate the relationship between screening sonography, the intent of such testing, and the potential to be informed of negative findings. In fact, as Valerie and Carol indicated, some did not consider an ultrasound to be an invasive procedure. It was sometimes suggested, an invasive prenatal test was, and rightly so, an amniocentesis or maternal serum alpha- fetal protein (MSAFP).

Donna voiced a possible explanation as to how women rationalize prenatal testing. She made this statement:

> Yes, I mean I suppose, that's interesting that you make that point because when you measure two medical procedures with potentially having the same result. I mean you could be finding out things as well. I suppose I have to go back to how they were presented to me in my first pregnancy and what happened was the midwife came to our house and sat down and sort of went through the whole thing. One of the things was the alpha-fetal protein and the other was the ultrasound. And I suppose they were probably presented in quite different ways. I mean the ultrasound was like this is something you do. It's like going to the doctor, it's part of your care, you have the option to come to the doctor every month. I suppose some people don't do that um, but most people do and probably, I guess my impression was that the ultrasound was sort of part of that package of care. Whereas the other test was something that was optional add-on thing you could do if you felt the need for it. But there are these other issues with it, it's not always that reliable. It may require that you have an amniocentesis which is risky for the baby. So I think probably those two things were presented quite differently to me in the first instance and I've just always kind of gone with that.

In the event the ultrasound did indicate something might be abnormal about their baby and they were offered further testing such as an amniocentesis, 13 participants indicated they

would consider additional invasive testing. The main reason for consenting to additional testing was to find out further information about the baby that would offer more options in decision making. Other reasons were "additional information allows for preparation time if something is wrong" and "it would be in the baby's best interest to know."

Seven women said they declined any further testing such as MSAFP. Reasons for this response were: "the MSAFP was not reliable;" " could not decide so declined;" " did not want to worry;" and "the way things are meant to be." One participant said she did not have an opinion because she had never had to make that choice.

Karen, who was 38 years old when she conceived, had received considerable counsel from her physician and personally sought out other resources as a means of becoming familiar with the risks associated with advanced maternal age and pregnancy. She and her partner had decided to have an ultrasound and MSAFP testing and depending on the results of these tests would or would not have an amniocentesis. Karen suggested invasive prenatal testing to be like a "two-edged sword" as she explained with this comment: "Because you think you're going in for the reassurance part, but in fact, what you're getting back is that there might be something wrong and you'd have to be ready for both of those answers." Karen also felt the system fails to properly inform women of the possibility of receiving negative results when they submit to invasive prenatal testing.

While it was "inferred" what tests could be done for prenatal testing, words like amniocentesis and MSAFP were not used by the investigator. This was done in an effort to have the participants voice, in their own "language", an understanding of these tests rather than have the investigator trigger their responses. A number of participants did

mention both tests in relationship to prenatal testing but not in association with sonography to which both have a direct link.

Seven participants spontaneously discussed the use of MSAFP as a test that could contribute to the knowledge of the health of the baby; some did described this test as invasive. Nevertheless, none voiced the idea that they were aware the information obtained from MSAFP screening had possible implications for further testing. Of the women who had MSAFP testing, some were offered the test, others felt it was an expectation to have the test done and one suggested she was not even aware the test had been done, indicating there are significant gaps in what women are told and understand about MSAFP screening.

Valerie described her feelings about MSAFP testing with these remarks:

> Like the optional blood test that you can do between 15 and 18 weeks, um, to show I guess basically if your baby would have Down's or anything. That I didn't do. It wasn't convenient for me to get to the city to actually do the blood test and I just, for myself, it made no difference. My concern with this pregnancy is not that my baby might, you know, have a disease like Down's or anything like that because it would not change my mind. It would not influence me to have an abortion or anything like that. My concern is that if there's something wrong that could cause the baby to die or be stillborn, that I would want to know about if it was preventable.

Discussions of Abortion

Just as Valerie has expressed, attitudes toward therapeutic termination of pregnancy or abortion were freely voiced throughout the interviews by several of the study participants. While these comments were not entirely anticipated by the investigator, eleven participants clearly stated they would not undergo an abortion should fetal

abnormalities be diagnosed. Julia, as noted in previous text, verbalized her feelings about abortion twice; once when she commented about her feelings after visualizing her baby on the ultrasound monitor and again when she spoke of pregnancy outcome.

Others spoke of abortion in reference to prenatal testing. Connie, who was 36 years old, stated she did not have genetic counseling because she and her partner had decided they would not terminate the pregnancy no matter what was diagnosed. Margaret had similar feelings as Connie. Shauna said, "she didn't have the right to take a life" and Tanis considered, "a fetus to be human right from conception onward."

Several participants stated they had declined what they referred to as "invasive" prenatal testing because of their views toward abortion. Tanis described her feelings with this statement:

> My doctor had, you know, offered me another blood test on my certain weeks where they check for spina bifida or something and then one side of things was they may see some Down's Syndrome or I can't remember. But I declined, no matter what I would never terminate it and then you have to try and figure out the decision of knowing there's something wrong with the baby and worrying about it for the next how many months or just, you know, preparing yourself when it happens and I just chose to, I wouldn't want to worry about it. I would never have a termination anyway so it was really, why go through with it.

Shelley voiced these thoughts about finding out "negative" things as she referred to them:

> Yes, like for myself, I sit there and say, I would never, I mean I believe it's a women's right to have choice whether she wants an abortion or not. For myself, I've never considered if like I would go, no I wouldn't have one. But then if I come out and find, well O.K., well I've got a baby or a fetus in there that has no brain, do I want to carry this to term or do I want to abort it.

Karen, when speaking about pregnancy outcome, voiced similar feelings to those Shelly stated. Karen, as previously noted, viewed prenatal testing to be like "a two-edged sword"; once you submit to testing in an effort to be reassured everything is normal, there is then also the chance you may receive bad news.

The Safety of Ultrasound

The safety of prenatal sonography was discussed with all study participants. Most had made an "assumption" about safety while a few had given the matter some thought. Overall, the impression given by the participants was ultrasound in pregnancy was safe. Several participants who considered sonography "non-invasive" felt it was safe compared with an amniocentesis and x-rays.

Julia made this comment: "They've been doing it for years and I have never heard of anything wrong with an ultrasound, x-ray yea, but not ultrasound." Tanis felt this way: "I guess I'm trusting, you know, I kind of think if my doctor thought that there was nothing wrong with it then okay." Denise suggested: " I assumed if they do it then it must be safe." On the other hand, she also said, " I assume like x-rays, like you can have one, it only becomes a problem if you have quite a few. One ultrasound is going to be fine."

Debbie made a collection of comments related to safety:

> No, I just took it for granted that it was safe....
> I never really questioned with ultrasound because
> I took it for granted that it was safe....
> No, I guess because it is so common, I've never
> heard anything to say that it wasn't....

Valerie expressed her views in this manner, " it wouldn't be done, like I mean they don't do x-ray while you're pregnant, so they wouldn't be doing this. It's been around for a number

of years, they would know already if there was harm." And Donna had these thoughts about ultrasound safety: "I don't think I would be sent for something that had high risk without being told about high risk. But that's an assumption I'm making and I certainly didn't ask anybody, you know what the risks are."

Janice, who had done extensive research and reading about being pregnant, made this statement about safety concerns:

> I was reading about it, the books say they're minimal.
> There's no scientific evidence of anything that really
> happens.....
> Plus I've always had them in the past before I was pregnant,
> so I've always been quite comfortable with them.....

Meanwhile Tanis used this line of reasoning, "I'm just, I guess trusting you know, I kind of think if my doctor thought that there was nothing wrong with it and everyone I know has had one pretty much."

For those participants who did voice some concerns about the risks or safety of ultrasound in pregnancy, they had received their information from a variety of sources: friends, reading material, co-workers, biology class and chiropractor. Four women mentioned they had heard "an ultrasound could damage the baby's ears." Karen expressed these views on the hearing issue:

> For the most part I understand that it's safe. There's sort of
> a weak causal link between the ear, something to do with the
> ear I guess, frequency of ear infections and ultrasound. But
> other than that I understand that it is quite safe.

Shelly, who did not want an ultrasound in early pregnancy, spoke about several safety concerns:

> I've also heard about the possibility of damaging the uh, if it's too early, damaging the DNA itself in the cells and messing up how the baby actually is formed, you know, they say that may have been no problem but then you do the ultrasound which, you know, chops up a hunk of DNA, sets off a little, You know, growth or cancerous or something like that.

Some participants felt it was the physician who should inform them of any possible risks associated with sonography. Debbie made this statement:

> Yes, that is definitely something that needs to be said in the doctor's office when he/she is telling you, advising an ultrasound of the risks involved, so you can make that decision before you actually get the ultrasound appointment and change your mind then and not waste the appointment time.

None of the participants felt they had a discussion with their attending physicians about any possible risks associated with ultrasound. Others suggested it was not up to them to raise the subject rather it was the physician who should offer that type of information.

In summary, the attitudes relating to informed consent, invasive prenatal testing, risks and safety of ultrasound suggest the public have an overwhelming trust in the medical system, namely the actual tests/procedures and those ordering and doing the tests. The apparent reasoning used by these study participants also suggests they lacked adequate information to truly be making an informed choice let alone give an informed consent.

CHAPTER FIVE

Discussion and Summary

The findings of this study will be discussed in this chapter. A comparison of the study findings, through the five identified study themes, will be made with existing literature as highlighted in a previous chapter. Implications for health care practice, limitations of the study, recommendations for future research and a study summary will conclude the final chapter.

Discussion of Findings

Anticipation

While the sample of women in this study averaged less than the current Manitoba statistics of 2.56 ultrasounds per pregnancy (Tudiver, 1993), it can be anticipated additional scans would be conducted on this group of women during their pregnancies. Nevertheless, given the controversy related to routine ultrasound in pregnancy (RUIP) and in particular the use of ultrasound as a screening test for anomalies, nine of the twenty study participants had what was termed a "routine" sonogram. In fact, 13 women felt an ultrasound in pregnancy was a routine test or that it should be.

How do we account for RUIP to be what many women consider "a standard of care" and why do they not appreciate it as a potential tool for prenatal diagnosis (PND)? Throughout history, it has not been uncommon for medical care or practices to become entrenched before effectiveness of the test or treatment has been examined. Such care or practices are then often "labeled" as routine; seldom do lay members of the community

question "routine" testing in health care nor are they asked for an opinion (Oakley, 1993). As a consequence of the routine label, informed choice and consent prior to the test being offered, will often be circumvented. Compounding the situation, failure to routinely offer an ultrasound in pregnancy has surfaced as a valid reason for litigation, therefore, health care practitioners now feel compelled to routinely offer sonographic testing despite a lack of evidence to support RUIP (Society of Obstetricians and Gynaecologists of Canada, 1999).

More importantly than feeling a scan was a routine prenatal test, participants of this study readily agreed to have an ultrasound or in fact wanted an ultrasound and in one case, demanded one. While the medicalization of birth may have convinced women they need technology to assure quality outcomes, significant subtle pressures have been placed on women to engage in testing. Some will argue it is offered under the pretense of giving women more reproductive choice and control. The right "to know" as an autonomous decision-maker can also be added to the pressure women face when making prenatal testing decisions. The "industry of technology" and "marketing forces" on consumers and health care practitioners must also be acknowledged as a form of pressure to use medical technology whether there is an evidence-based need or not.

This intrusion of technology has reshaped how women feel and experience pregnancy and perhaps ultimately how they feel toward their children (Lippman, 1991; Queniart, 1992). Tudiver (1993) also suggests, "the testing becomes integral to how women describe the progression of their pregnancies." Several participants described the ultrasound experience as if it were part of the anticipated prenatal "package of care." This

finding was similar to views expressed in the study by Tudiver (1993).

The introduction and increasing dependence on technology in obstetrics and indeed all of medicine may account for some of the attitudes society has toward technology. There now appears to be an acquired need by society to want technology or expect that it will be used in health practice. It is speculated the women of this study felt a "need" to have a prenatal scan and expressed this need by "wanting" an ultrasound.

Lippman (1991) transcribes this need as the result of social, cultural and historical constructs and is, therefore, not universal. She refers to this as a "conceptualization of need" whereby the need is created after the test has been developed. The notion of need is also expressed by some as a means of reproductive choice. For example in obstetrics, need is created by the idea of risk, prevalence of genetic disorders, knowing correct fetal age and demonstration of appropriate fetal growth. Further to this, Queniart (1992) coined the term "risky business" to describe how difficult it is for women to decline a prenatal ultrasound when it is offered as a test "just to be on the safe side."

Lippman (1991) also suggests the notion of need becomes a self-fulfilling prophecy and rapidly generates further technology, new professions and health practices. The evaluation of new medical technique offered by Oakley (Appendix C) appears to confirm Lippman's "conceptualization of need". Obstetrical sonography, as described by Oakley (1993) is fundamentally another example of medical technology, in which it was introduced and administered as routine practice before its effectiveness, benefits and safety were confirmed with research. From this pseudo creation of need there appears to be a natural progression by women to internalize the need, fear what might happen to them and

their babies if they do not have the test and seek testing for reassurance.

Queniart (1992) feels "this need" centers around the idea of risk which creates an obsession with normality and seems to drive women to extremes in order to obtain reassurance about their pregnancies. She also feels testing has placed greater importance on the fetus and women now feel even more compelled to have a good outcome. Women not only want tests for the reassurance of normality, they will subject themselves to multiple forms of testing during pregnancy in an effort to achieve a worthy outcome. This acquired desire to seek "reassurance" from prenatal testing emerges not only from the literature but was also a common-thread throughout this study. Several women did say, however, they declined further invasive prenatal testing and would accept whatever outcome came their way.

For the participants of this study, their apparent "need" for a sonogram appears to result from their experiences rather than the factors cited by Lippman (1991). Did the participants translate their "need" for reassurance into "wanting" an ultrasound? The two health care professionals in this study did not fit this profile and felt RUIP is not warranted, rather a scan should be ordered when a complication of pregnancy arises.

While the women in this study gave a number of reasons for wanting a prenatal ultrasound, the quest for reassurance was decidedly the underlying premise for wanting, asking or accepting a sonographic referral. This finding was consistent with other studies which directly or vicariously examined reassurance (Hyde, 1986; Nelson & Grant, 1989; Thorpe et al., 1993; Waldenström, 1996). Statham, Green and Kafetsios (1997) suggested that "reassurance is needed only because the tests created doubts in the first place"

(p.223). Baillie, Mason and Hewison (1997) suggest the reassurance women claim to feel following a sonogram may be transient which adds further support to the premise a scan simply relieves the anxiety resulting from the referral.

In addition to wanting reassurance, Tudiver (1993) refers to the "technological imperative" where women want testing because it is available and will sometimes pressure health care practitioners to order tests. This results in a conflict, parental rights to know as much as is available through testing versus the health care practitioner's obligation to offer appropriate, evidence-based testing. Similarity to the "technological imperative," the "therapeutic imperative" is described by some as a means of justification, whereby because the technology exists, health care practitioners are inclined to use it citing professional and consumer pressures and fear of litigation as their motivation. Oakley (1993) supports the idea of the "therapeutic imperative" and offers prenatal sonography and electronic fetal monitoring as two examples in obstetrical medicine that meet with this description.

As highlighted in the literature review, research has examined the role of anxiety and reassurance in prenatal sonography. Similar to the statement by Statham et al. (1997), others feel an ultrasound also decreases the anxiety a referral creates, therefore women find the scan to be reassuring (Lumley, 1990; Sandelowski, 1988; Schei, 1992; Stewart, 1986). Research suggests reassurance from a scan is dependent on the provision of "feedback" during the actual ultrasound. The desire for feedback (i.e., information) about the scan was another common thread throughout the data. Study participants repeatedly voiced frustration about the lack of feedback and made this issue a recommendation for change in practice.

In the study by Hyde (1986), women in the "selective" group (clinical referral) reported they felt less reassured by having an ultrasound compared with the "routine" group (RUIP) who felt higher levels of reassurance. It may be that if a test is "routine" it implies normality therefore, negative information or results are not anticipated from the testing. If labeled as routine, do women automatically expect to be sent for a scan, feel little need to ask questions about the test, feel confident the results will be normal and are assured their attending physician would not be sending them for unnecessary medical tests? Or perhaps, as some have speculated, having the test relieves women of the anxiety created by the referral (Lumley, 1990; Oakley, 1993; Statham et al., 1997).

Most women in this study expected to be sent for a prenatal sonogram. They also went for their scan with an array of mixed psychological feelings. For example, some felt anticipation, others had expectations and some experienced anxiety. Going for an ultrasound and the possible resulting anxiety have been investigated and in particular, the relationship between the amount of "feedback" women receive during their scan and anxiety levels. Studies by Cox et al. (1987), Lumley (1990), Milne and Rich (1981), Sparling (1988), Reading and Cox (1982) and Zlotogorski et al. (1995, 1996) suggest women had less anxiety when they received high levels of feedback or information during the scan regardless if sent routinely or for a specific indication.

Findings of this study would concur with the earlier research on anxiety. The lack of feedback given to the participants at the time of the exam and later by the doctor, proved frustrating for the participants and their partners. Several felt waiting for the results of the scan created anxiety.

The idea of "worry" was voiced by 12 participants and was most pronounced in a small subset of these 12 women. This smaller group had experienced either a prenatal loss or vaginal bleeding at some stage in pregnancy and expressed considerable anxiety as a result. These same women desperately wanted a scan for "reassurance." Statham et al. (1997) noted most pregnant women worry, however, those with a complication have higher levels of anxiety and worry. In a recent study by Cote-Arsenault and Mahlangu (1999), the authors described how women felt in a subsequent pregnancy to a perinatal loss. Findings in their study suggest women have guarded emotions and anxiety, and relate to milestones in the present pregnancy to gauge their progression. Milestones were illustrated in this subset; one participant who had experienced vaginal bleeding stated how important it was to get to the "magical nine weeks."

Several participants felt they had to justify either to themselves or the study investigator why they agreed to have an ultrasound, asked for one or wanted one. A possible explanation for justification may have been the underlying worry or their desperate need to be "reassured" everything was okay. The participants expressed the need for reassurance throughout the interviews and implied it to be the most compelling reason for "wanting" an ultrasound.

This study has demonstrated that the women in this sample were under the impression prenatal ultrasound is a routine test in pregnancy. Curiously, they did not perceive obstetrical sonography as a type of prenatal diagnosis (PND) nor did they feel having a prenatal scan will change the birth outcome. These views are intriguing and warrant further investigation.

Implications for Health Care Practice

Serious consideration needs to be given in health care as to how "routine" testing is offered and implemented. It appears and is supported in the analysis by Oakley (Appendix C) that RUIP is just one more example in medicine in which the application of technology was formulated and incorporated into clinical practice before randomized controlled trials indicate altered outcome. When combined with the idea that a sonogram in pregnancy is routine practice and having a need for "reassurance," women not only want the test, they are asking for it. If women are "asking" for sonograms, some authorities may blame consumers for the extensive use of ultrasounds in pregnancy.

While not all of the women who had experienced a loss or vaginal bleeding felt RUIP was necessary, the compelling need for "reassurance" from an ultrasound was evident in a small subset of this study. Bleeding in pregnancy generates anxiety not only for the safety of the baby but for the mother as well. Findings of this magnitude suggest health care practitioners should be particularly sensitive to this indication for prenatal testing.

The Imaging Experience

There are limited data that describes the actual "physical" experience women have during a prenatal ultrasound. The experience can no doubt account for some of the attitudes women have about the technology. This will not only have an impact on themselves but others with whom they share information. In addition, if women are expressing consistent negative events related to the "experience," this should be viewed as a signal for investigation and possible change in practice.

There were mixed feelings among the participants about the time they waited to have a sonogram. In addition to the anxiety this wait creates for women, timing of an ultrasound is a key factor associated with improved fetal outcome. For example, if the referral is for dating of pregnancy, fetal biometry to establish gestational age is best conducted at 15 – 20 weeks of pregnancy. With a delay in testing of eight to ten weeks, this optimal window for assessment will most likely be missed. And in the case of RUIP, if one of the true intentions of screening is to detect fetal anomalies, again timing is critical; if anomalies are detected and the parents choose to terminate the pregnancy, this too needs to be determined under 20 weeks gestation.

Much of the physical preparation for a scan is necessitated by the mechanics of sonar technology. The newer types of imaging techniques, for example, vaginal sonography, have altered some of the physical discomforts such as the "full" bladder. Many facilities do not have women remove their personal clothing rather they cover the clothing appropriately, this of course is dependent on the type of ultrasound to be done. And there is definitely an issue of privacy and confidentiality if testing is being conducted in a large open room with only curtains separating patients. If women felt this was inappropriate, they have every right, morally and legally to request privacy. Most women in this study, and it may well be typical, were so intent on the "experience" that they expressed little concern about the lack of privacy.

As described in the literature and noted in the previous section, the impact of "feedback" during the scan was crucial to the "experience." This was not a new finding as several studies have described the importance of good communication between the

sonographer and patient. Nevertheless, as stated earlier, the significance of feedback was viewed as another common thread throughout the narratives. While no other study has specifically investigated the concept of respect and sonography, participants in this study felt respected during the examination. In the Tudiver (1993) study on technology and pregnancy, reference to "respect" was made as a vital component in the overall well-being of women during pregnancy. Sadly, it is not uncommon to hear women say there was a lack of respect shown by practitioners when receiving health care services (Reid & Garcia, 1989; Tudiver, 1993).

Expectations of the "experience" appeared to influence how the participants described what they could actually interpret on the monitor. For many, this visualization confirmed the pregnancy and for those participants who had experienced a previous prenatal loss or vaginal bleeding, it signaled the start of an emotional connection to the present pregnancy. This finding was consistent with reports by Petchesky (1987), Sandelowski (1988) and Waldenström (1996).

All participants expressed the visualization experience in "positive" terms. Weir (1998) describes similar reactions in her study, women referred to this "clinical imagery" as proof or verification of the "little human" inside of them. Petchesky (1987) suggests that while sonographic fetal images can provide women with gratification and self-esteem, their pregnancy is no longer a private affair as now their baby can be put on public display via an ultrasound monitor. It appears women are not troubled with this means of public display as they are keen to have a prenatal scan.

Several participants were annoyed with hospital policies or protocols encountered during the scan. Policies about the presence of a support person, requests for photographs or video-taping the exam and lack of information during the scan produced feelings of frustration and distress. Tudiver (1993) found similar feelings and called for a need to negotiate for a "personal domain" during medical procedures. Protocols and policies involving health care are based on patient respect, privacy and safety and are understandable, however, research has clearly demonstrated the value of support for women during periods of vulnerability such as medical examinations (Reid & Garcia, 1989). Villeneuve et al. (1988) reported mothers felt more attachment to their babies if their partners were present during the ultrasound.

There are varying policies across Canada with regard to the practice of giving out sonographic photographs and agreeing to video-tape. The American Registry of Diagnostic Medical Sonographers does not support these practices citing the use of diagnostic imaging is a medical procedure and not a venue for entertainment. Additional cost, time management and medical-legal ramifications are most often issued as reasons for not complying with these requests. Nevertheless, parents are enticed to want such keepsakes as baby books now have space for "baby's first photo" meaning an ultrasound photograph and many "pregnant couples" on television coincidentally receive photographs from their ultrasound experience. Some parents offered to pay for photos in an effort to off set cost. Weir (1998) demonstrated when women were given a photograph, they used it to visualize their own body interiors, to introduce the "new baby" to family members

prior to birth and it acted as a "prompt" to prepare for the new addition and incorporate the baby into the family structure.

Participants, who wanted a photograph or video-taping, struggled to articulate meaningful reasons for this type of request. Several said it would be a nice keepsake, while others stated they knew of other women who received a photo, therefore they too wanted one, as if it was the "going fad". There is an apparent need for consensus on this issue and new legislation pertaining to access of personal health information may force the issue for review sooner than later.

The request for photographs of the ultrasound experience raises several points for discussion. Technology is reshaping society's expectations of the health care system, creating a new wave of expressions and interactions with meaningful events in our lives. Some may also say technology is creating cultural artifacts such as the desire to have a sonographic keepsake i.e., a photograph of their "fetus in utero."

Influence(s) on the participants, such as religious beliefs and lifestyle habits, did not appear to overtly shape their attitudes toward prenatal sonography. Similarly, if participants were going to change any lifestyle habits as a means to improve the health of themselves and their baby, they had either done so before getting pregnant or shortly thereafter. These findings are consistent with Eureninus et al. (1996) who found most women and their partners who smoked, quit or reduced the amount smoked each day had done so before pregnancy or the ultrasound. Other studies could not separate which variable altered habits, the feedback during the scan or the actual visualization of the fetus.

The first fetal movements reported by a woman, referred to as quickening, have historically been considered one of the cardinal signs and stages of pregnancy. Later in pregnancy, fetal movements are thought to reflect a state of fetal well-being. Sandelowski (1988) feels this cardinal sign of pregnancy has been replaced with what she refers to as "technical quickening" whereby women now view fetal movements much earlier than actually feeling them. Sandelowski (1988) fears this has lead to an erosion of maternal confirmation and confidence about the pregnancy and fetal well -being. Fetal movements have been hypothesized as a facilitator of fetal-maternal bonding (i.e., attachment). With the advent of ultrasound, it was postulated sonographic fetal visualization would facilitate fetal-maternal bonding even more so than movements alone.

Findings in this study revealed mixed feelings about the impact of fetal movements. Two distinct groups emerged; one felt fetal movement was more valuable as a sign of fetal well-being and did not enhance bonding, and the other group clearly felt seeing the baby on the monitor produced a greater sense of bonding. These findings concur with previous research that investigated fetal-maternal bonding. Studies by Fletcher and Evans (1983), Kohn et al. (1980), Lerum and Lo Bionodo-Wood (1989) and Milne and Rich (1981) implied attachment was increased following a prenatal scan. Nevertheless, all other studies investigating fetal-attachment and sonography do not support this relationship. Therefore, the mixed findings in this study are consistent with earlier research.

Universally during an obstetrical scan, women do not face the monitor for viewing while the scan is being conducted. Typically at a designated time later in the exam, the woman and her support person will view a monitor. Several participants wanted to view

the entire examination and again this policy or practice was frustrating for the women. The common explanation for this practice is, that the sonographer is concentrating on her/his examination techniques and does not want distraction from constant questioning. Some may view this practice as just another example of how health care practitioners maintain control of the health setting and practice, while others may interrupted it as power.

Implications for Health Care Practice

The majority of women in this study viewed a sonogram in pregnancy to be a positive experience. They found it to be reassuring and described the event in favourable terms. For some, visualizing the fetus made the pregnancy real and induced communication with the baby on a "personal note." For those participants who felt frustrated over policies or protocols, for example, not allowing their partner in for the entire scan, most achieved some sense of satisfaction from the experience and got the information they wanted. It was obvious from the narratives that often it was the "exchange" between the participant and sonographer that set the tone for the experience.

The participants did, however, offer numerous suggestions as to how the experience or practice could be improved and these included: a) not having to remove all personal clothing; b) information to be offered either during the scan or shortly thereafter; c) review of hospital policies related to admission of support person, giving of photographs and allowing video-taping of the examination; and d) allow clients to visualize the monitor throughout the entire scan.

Suggestions made by clients should be considered as a signal that institutional policies related to practice warrant review. The need for such review arises not only from a client

perspective but for quality control as well. So often policies are implemented to facilitate the needs of "the system" as opposed to the needs of "the client." Exam techniques change with the advent of new technology and research reveals where the system needs improving. Morally and legally clients have the right to receive safe, competent care but it also has to be "sensitive" care.

Conflicting reports continue to surface about the benefits of using sonography as a means of promoting fetal-maternal bonding. Research has postulated the provision of "feedback" during an ultrasound exam decreases maternal anxiety that could impact on bonding. Therefore once again, there is an apparent need to explore ways to provide women with appropriate information at the time of their ultrasound. This practice would have significant impact on the role of sonographers.

The Importance of Knowing

Needless to say the women in this sample were eager to obtain information about their sonogram and "to see" the baby. Most had anticipated they would have an opportunity for both of these experiences at the time of the scan. This anticipation did not materialize for several participants of the study. How do we account for this apparent downfall in patient centered care? It may be a refection of inadequate planning or standards of practice. Further more is it important? The findings of this study and others would indicate "feedback" is crucial if women are to benefit from prenatal sonography.

As early as 1981, research indicated feedback at the time of the sonogram had the potential to reduce maternal anxiety (Cox et al., 1987; Hyde, 1986; Oakley, 1993; Sparling et al., 1988). Research also suggests detailed information along with a visual

explanation results in a more positive experience for women (Milne & Rich, 1981; Reading & Cox, 1982; Villeneuve et al., 1988). Several women in this sample were uncomfortable with the silence in the room as the exam was being conducted while others tried to read the face of the sonographer in an effort to extract potential information from facial expressions. Some participants felt the sonographer placed greater emphasis on the equipment than the client. This concurs with the findings of the Tudiver (1993) study.

Despite normal ultrasound findings, Stewart (1986) and Hyde (1986) reported some women still find a prenatal ultrasound to be an unpleasant experience due to a lack of communication at scan time. Neilson and Grant (1989) suggested this lack of communication could negate any potential benefits the scan may have had in the first place. And if silence is viewed as a lack of communication and women are resorting to "face reading" in an effort to get information, there is indeed concern with the manner in which this test is being conducted and how information is being distributed.

Who should be responsible for giving information during an ultrasound examination? What standards do other medical imaging departments such as radiology and magnetic resonance use? Some will offer that prenatal sonography is unique, given the potential to facilitate the transition to parenthood, decrease anxiety and increase fetal-maternal bonding for both parents. Currently, professional constraints limit the information sonographers can provide to clients. This practice is frustrating and appears to create anxiety for clients while waiting for test findings. Sonographers should be investigated as to how they feel about this issue and furthermore, do they want a role of sharing more with clients? Each medical encounter can be biased positively or negatively by the

sonographer and client response to the ultrasound experience will be shaped by this bias. Again, these are apparent issues that need to be addressed.

Tudiver (1993) reported when women attend for tests involving reproductive technology, they bring their own expectations, histories and fears to the encounter. They often feel intimidated, fail to appreciate what "routine" implies, feel they cannot question the practitioners, sometimes feel patronized and often feel rushed through the procedure. Participants of this study voiced similar concerns. These feelings may account for why the participants did not appreciate prenatal sonography to be a tool for PND. This apparent gap in client knowledge is further proof of poor communication between clients and health care practitioners.

What information did the participants actually want to hear about their scan? Basically they wanted to hear if their baby was "okay". How they framed this desire in the interview varied, as some stated specific features and others were pleased to just see the baby. A majority of the women went for their scan without thinking they could possibly be told bad news. This apparent compliance is concerning and is postulated to be a possible sequelae to the inherent notion that a prenatal ultrasound is a "routine" test.

If women are not receiving adequate information from health care practitioners, where and how do they fill in the knowledge gaps? Family, friends, professional backgrounds, television, past experience and sundry general reading material were cited as their sources. When asked if they had received any specific written material on prenatal sonography, all stated they had not, but would definitely read such material if available. There is obvious need for this specific type of educational resource with an emphasis on

appropriate readability. Findings by Eurenius et al. (1997) suggested parents require both written and verbal information in order to be truly informed about prenatal sonography.

The desire to know or not to know fetal sex produced mixed reactions. Given the controversial response to the use of sonography for this purpose, participants of this study reacted to the issue in a manner that was consistent with reports in the literature. Approximately half of the participants or their partners wanted to know fetal sex and all gave reasons for knowing and not knowing. This even split of wanting to know and not wanting to know was consistent with findings by Villeneuve et al. (1988).

The knowledge of fetal sex prior to delivery has not received sufficient attention. The social pressures to obtain this information when going for a prenatal sonogram are considerable. Preference for a particular sex raises numerous ethical concerns. In addition, how this knowledge affect a woman's relationship with her unborn child and later in life is unknown.

Implications for Health Care Practice

Medical technology has produced a shift in our knowledge base, values, attitudes and expectations and as a result, health care has changed forever. Fetal imaging now provides an opportunity for practitioners and parents to see "inside the womb," creating a conduit to obtain unlimited information about the fetus. The risks and benefits of this additional information have received some attention from the scientific community but there are still many unanswered questions. Practitioners are left sometimes wondering whether or not to inform parents when there is uncertainty in the findings. The consequence of false

positives or false negatives is an additional risk to consider when incorporating sensitive medical screening tests.

The implications of good communication between clients and practitioners cannot be emphasized enough. Personal, professional and social consequences result when there has been a communication breakdown between parties. The provision of information is key to understanding and essential for everyone involved to feel satisfaction. Women want to know the results of their prenatal sonogram either at the time of the scan or shortly there after; waiting only creates negative effects. There appears to be a need to avoid the current practice of informing women weeks later about their testing results.

The Next Time

The idea of going for a repeat sonogram was discussed with all participants. It was apparent their attitudes about a repeat scan may have been influenced by the interview process. Several participants noted they had not thought about some of the issues explored during the interview and their relationship to testing. Some said they would prepare themselves differently if there was a next time and others said they would change nothing and gladly go.

Good lines of communication would be essential should there be another scan. Participants made specific suggestions they felt would improve communication and this included a suggestion for health care practitioners: "to speak in a language lay people can understand;" " to speak directly to the client as opposed at the machine;" " to provide information in a timely and sensitive manner;" " to be aware of the many feelings women might be experiencing during an examination;" " to allow the women to view the monitor

throughout the entire scan;" and "to provide an explanation of the exam as it was being conducted." Again these suggestions have been reported in earlier studies (Lumley, 1990; Sandelowski, 1988, 1994; Tudiver, 1993). When asked what advice they would give to others, participants said they would say having a prenatal ultrasound was a positive experience. Physical preparation, communication issues and hospital policies would also be important issues to discuss.

Each participant was asked if they thought having an ultrasound would change the outcome of their pregnancy? Interestingly almost 75% of responses said the scan would not alter outcome. Why then were they so seemingly keen to have an ultrasound in the first place? If women fail to clearly understand why they have been sent for a scan and if they also believe it is "routine," the intent and value of the test will never be appreciated. Several women spoke of what the findings meant to them in the present tense as opposed to what the ultrasound information might mean to them in the future.

The importance of sharing either the ultrasound experience or information about the scan with someone was a vital part of the event for all participants. In particular, they seemed keen to share with another female. This was intriguing and obviously an important "exchange" for these women and perhaps, women in general following any medical encounter. It may be that women communicate differently with each other, have a better understanding or listen more intuitively. It may also be relevant as a type of "bonding" for women when pregnant.

Participants were invited to ask the investigator questions at any point in the interview. Once again it was felt some of their questions were stimulated by the interview

process itself and, in particular, reference to the safety of sonography. This impression, plus asking what ultrasound really was, gave the impression that women are clearly not well informed prior to going for this type of prenatal test. Were these women reluctant to ask their physician questions or did they simply assume all tests in pregnancy were done for a good reason? This may have been, once more, another illustration of the trust the public places in their physician and health care system.

Implications for Health Care Practice

Verbalizing and sharing information appear to be important activities for pregnant women. This may result from feelings of uncertainty, lack of feedback or the compelling desire to seek reassurance. Participants were eager to express their ideas as to how the ultrasound experience could be improved. Several of these "improvements," like policies and communication, have been previously discussed and have implications for practice.

Given how the majority of this sample felt about testing and outcome and in the absence of firm evidence to support RUIP, what benchmark will be used to justify the continued use of RUIP? At present, psychological benefits alone are often cited as justification for RUIP. The BCOHTA Report (1996) outlined two concerns related to using psychological outcomes as endpoints when determining the provision of health care services. First, an appeal to client satisfaction, peace of mind and reassurance is so universal that almost any health care service could incorporate these as effective indicators. Second, many of the positive psychological outcomes stem directly from the existence of the technology itself. Both concerns were raised in this study on prenatal sonography and can be accounted for in the data.

Few policy makers would support psychological outcomes alone as criteria to establish "best" practice patterns or medical standards of care. Nevertheless, it would appear these outcomes are currently the sole reason for offering RUIP. The women in this study, for the sake of reassurance and feeling there is a "need" for testing, would support a policy of offering routine prenatal sonography to all women.

The Ethics of It All

This entire data set was an intriguing collection of "ethical" revelations. During the interviews and analysis, it was sometimes difficult to separate the revelations from one another as they appeared to be linked together like a maze. Since RUIP is not offered in Canada as PND, this may account for why RUIP is not considered to be PND by the public or even health care practitioners for that matter.

In view of this attitude, there appears to be a need to clarify the terms "screening" and "diagnostic" in relationship to prenatal testing. Cuckle and Wald (1984) define screening as, "a means of identifying, among apparently healthly individuals, those who are sufficiently at risk of a specific disorder to justify a subsequent diagnostic test or procedure" (p.1). Screening tests, therefore, are not designed to be diagnostic or definitive, rather they are to detect persons with a high probability of having a characteristic of the disorder (Larson, 1986).

Women (couples) need to understand the difference in order to make informed choices about prenatal testing and to establish appropriate testing expectations. Screening tests are said to be useful if they are simple, convenient, reliable and cost effective

(Larson, 1986). Given that RUIP does not appear to improve fetal outcome, it could be argued RUIP does not meet with all these conditions or any for that matter and therefore, a prenatal sonogram should not be routinely offered to women.

Lippman (1991) defines PND as, " technologies currently in use or under development to determine the physiological condition of a fetus before birth" (p.19). She also claims PND to be the most widespread application of genetic technology on humans. Medical guidelines mandate that prior to having a test for PND, parents are to receive counseling as part of the informed consent process.

Informed consent is based on the ethical principle of autonomy. In order to give informed consent to medical procedures, one must first be "informed." Having an ultrasound requires the giving of consent prior to the examination. Common practice in health care prior to a diagnostic test, if one is competent, is to give "implied" consent following an explanation of the proposed test. This was the practice at the participant recruitment center and is consistent with most Canadian diagnostic imaging facilities.

Considering the current extensive use of RUIP for screening purposes, Lippman (1991) firmly believes prenatal ultrasound should be "labeled" as a prenatal diagnostic test and as such ought to require informed consent. Given the potential for prenatal sonography to reveal findings with major clinical dimensions affecting the baby, parents, family and their entire social structure, this technology needs to be respected and treated as such. Therefore, on the basis of autonomous decision making, if women are not offered an opportunity to discuss and sign an informed consent for a prenatal sonogram, serious knowledge gaps may result and compromise maternal autonomy.

Nevertheless, in view of this attitude, women fail to realize this "simple" prenatal sonogram could set them off on a cascade of events and decision making, such as amniocentesis and discussions of having a therapeutic abortion. Most women in the study and in particular, those sent for RUIP were expecting to hear that everything was fine. Thus only a few had done any preparatory work for possible negative findings and the long-term consequences of these findings.

In addition and aside from sonography, attitudes toward MSAFP testing in this sample of women also revealed a gap in knowledge. Not all of this cohort of women described MSAFP as an invasive test nor did they articulate the relevance of the testing. It appears once again women submited themselves to prenatal testing without clearly understanding the purpose of the test? As more prenatal tests become available and offered, it is anticipated women will continue to seek out these tests for further reassurance. When offered as a sense of control, choice and reassurance, Lippman (1991) contends PND appears attractive and difficult to decline.

Gregg (1993) describes reproductive choice as a "double-edged sword". Ironically, one study participant described prenatal testing as a "two-edged sword" meaning you submit to PND seeking reassurance and; yet the findings may reveal the opposite. The presence of technology and testing now "pressure" women into making choices and when tests are treated as "routine", choice often becomes ambiguous. And indeed, one participant thought she had no choice about going for a scan.

The more we are able to discover about the fetus with the current barrage of available prenatal tests, more responsibility is placed on women for a good " outcome" (Gregg,

1993; Lippman, 1989, 1991; Oakley, 1993; Petchesky, 1987; Queniart, 1992: Sandelowski, 1994). The struggle by women to control their own fertility has long been a cornerstone of the women's (feminist) movement. Women are now expected to be responsible for "quality control" and to act in a manner that will ensure nothing goes astray during pregnancy and childbirth. Some feminist critics cite prenatal testing as yet another way to control the bodies of women, leading to further oppression of women (Mazzeo, 1988; Ruddick, 1988).

Reproductive technology and prenatal testing have forced individuals and society to re-examine their attitudes toward therapeutic abortion. Once women are offered the choice of PND, abortion is placed on the continuum of options (Lippman, 1991; Sandelowski, 1988). In this study, discussion around PND acted as a trigger for participants to voice their attitudes on abortion. While several stated women should have a choice for an abortion, it was not a choice for any of the participants of this study.

These attitudes were curious given the majority of women in the study wanted a prenatal sonogram and declined further invasive prenatal testing such as MSAFP. One possible explanation for this response may be associated with the fact that a prenatal sonogram was not considered to be a method of PND. Would they have refused a scan had this been made clear to them given their attitudes toward abortion?

The introduction of new medical treatments, procedures or drugs is typically preceded by extensive research to ensure human safety and product efficiency. Arguments against RUIP often refer to the absence of long term epidemiological studies confirming sonography in pregnancy to be a safe diagnostic test. Discussion during the interviews

about the safety of sonography appeared to surprise many participants. From their responses, little consideration had been given to the safety factor, participants simply assumed ultrasound was safe. This finding was in contrast to the study by Thorpe et al. (1993) where safety was a concern for the mothers. In addition to the idea of ultrasound as being safe technology, several participants "reasoned" the safety of ultrasound by making reassuring comments. Some had made an effort to research ultrasound safety and others had heard "stories" that gave them some level of reassurance.

For those who did raise safety concerns, four of the five spoke of "hearing" problems babies may experience following prenatal sonography. While the possible link between delayed hearing in childhood and prenatal sonography has made, current scientific evidence refutes this connection (SOGC, 1999). Additional adverse effects that have received scientific inquiry are childhood growth and cancers, vision, left handedness, speech delays and birthweight. One participant had an appreciation for cell biology and expressed strong feelings about not having a scan in early pregnancy to ensure the safety of first trimester fetal development. These concerns have been raised in the popular press as well, however, to date there is no scientific evidence of a deleterious effect from ultrasound on the developing human fetus (SOCG, 1999).

Further to this, Kieler, Haglund, Waldenström and Axelsson (1997) conducted a follow up study on eight to nine year old children born to women who participated in a randomized controlled trial in prenatal sonography done for screening purposes. Questionnaires from 3,265 mothers were analyzed to see if there was an association between prenatal sonography and impaired childhood growth, vision and hearing. This

study, as in two similar studies conducted in 1984 and 1992, found no association between prenatal ultrasound exposure and childhood growth patterns and vision and hearing impairment.

Why was the concern of impaired childhood hearing and sonography so prevalent in this sample? None of the four participants could articulate specific reasons for their views and often their remarks echoed what "others" in the lay community had said rather than credible sources. Issues around misinformation are concerning and sometimes produce unfounded doubt and anxiety. This is one more example whereby had there been effective communication with appropriate sources, these participants may have received reassurance for their concerns of hearing impairment.

As the 20th century draws to a close and having passed through a decade in which revelations about the safety of our health care system and regulatory processes are being exposed, how can the profound trust these women displayed for prenatal sonography be explained? What should consumers be told about the safety of ultrasound? An appropriate response to this question would simply be to tell them the truth.

To date there is no conclusive evidence that prenatal sonography is harmful. One significant question remains: how can the continued use of RUIP be justified without sound evidence to suggest this practice improves clinical outcomes? Given the current scientific evidence and shrinking health care budgets, policy makers and regulatory bodies have all the more reason to only implement safe, evidence-based health care practice.

Implications for Health Care Practice

The advent of PND has forever changed the context of reproductive choice and control not only for women but society in general. This study is an illustration in which women are again expected to make the "right" decisions i.e., have a prenatal scan without question. Women are making these decisions every day, however, it would appear the system fails to give them all the information in order to make an informed decision.

How critical is it that women and their partners understand prenatal sonography to be a method of PND? Since the vast majority of pregnancies result in normal outcomes, some may argue there is no harm in having parents believe a prenatal scan is not PND. Nevertheless, this fact is difficult to ignore given the possible information an ultrasound can provide resulting in extensive discussion and decision making. This information can act as a catalyst for a variety of treatment options including therapeutic termination of pregnancy.

Therefore, if Canadian medical authorities are recommending routine sonography be offered at 18 weeks gestation, it becomes obvious the intent of the test is to screen for congenital fetal anomalies. Clearly then, the technology is being applied as a means of PND and should be offered in this context. Women and their partners therefore, require formal counseling prior to a prenatal sonogram, and some would also argue, sign a consent form (BCOHTA 96:2D, 1996; Ewigman et al., 1990; Chervenak, McCullough & Chervenak, 1990; Chervenak & McCullough, 1989; Lippman, 1991; Thorpe et al., 1993). Neither counseling nor consent signing for RUIP is currently practiced in Canada. All methods of PND must respect human rights both as a social value and legal precedent. It

is apparent there is a need to make changes with the practice of RUIP.

Although there are no known adverse effects related to prenatal sonography, women are not actively counseled with respect to ultrasound safety. False positive or false negative results, increased intervention and a growing dependency on technology are some possible risks women rarely hear about prior to RUIP. Practitioners are accountable for describing risks as well as benefits when ordering medical tests. Discussions of this nature require adequate time, therefore, extra time needs to be allocated during prenatal visits for this purpose.

Limitations

All research, be it experimental or non-experimental is never flawless. These "flaws" are known as limitations of the scientific method (Polit & Hungler, 1991). At some point in the research process, the investigator must acknowledge what she/he feels to be limitations of the study. The following were felt to be limitations of this study.

Potential for bias when using convenience sampling must be acknowledged as these samples tend to be self-selecting. As well, there was potential for "elite bias" as this was an articulate, well-educated sample of study participants. Both of these possibilities are considered a limitation of the study. Another limitation was thought to be the potential risk to transferability or how well the study findings fit with other populations, as all participants were recruited from one, urban health care center. The women in this study were also homogeneous in nature with little diversity in all aspects of their demographics.

Data for this study was obtained from a single interview and during a particular

pregnancy. This allowed for only one opportunity to have the participants tell their "story" and since some of the participants had sonography in previous pregnancies, they often blended their experiences together which resulted in "mixed" feelings about their attitudes toward prenatal sonography. This was also felt to be a study limitation.

Finally, despite recognition of this fact prior to data collection, the clinical expertise of the study investigator needs to be acknowledged as a study limitation. Because of a familiarity with issues around prenatal sonography, it was felt at times the investigator lost her sense of objectivity given her past experience and attitude about RUTP. One participant acknowledged this fact by stating she felt the interview questions had a hidden agenda and the investigator was hedging responses. This comment acted as a prompt for the investigator to strive for a non-biased approach during the interview process.

Recommendations for Further Research

Scientific inquiry inevitably creates ideas for further research. Knowledge generated from additional study will not only compliment health care decision making and policy development, it will also achieve "evidence-based practice" for the health care of women and their families. Several recommendations for further investigation emerged from the findings of this study, however, only three have been highlighted as having the most potential to benefit women. The other recommendations have been stated in general terms:

1. The practice of "routine testing" in relationship to prenatal sonography requires additional investigation. Unfortunately at times, health care practices are vicariously "labeled" as routine prior to adequate scientific inquiry. This practice not only creates

great cost to health care systems but to society in general. Qualitative research will be essential in further analysis and our understanding of what can be termed the "routinization of prenatal testing."

2. From the comments made by this sample of women, it appears diagnostic imaging units should examine their policies around "feedback" during a scan, physical preparation for scanning, informed choice and consent, monitor viewing during a scan, presence of a support person and provision for photography and video-taping. Further knowledge and understanding of these isues and practices would allow for informed decision making, client satisfaction and ensure women receive "senative" care during their scan.
3. It was also apparent from this study, there is a need for written material that women can read prior to an obstetrical sonogram. A proposal to the appropriate authorities stating the need for such educational material should be made. Provision for updating and evaluation of the material at a later date should be included. This could take the form of a needs assessment or user survey.

Additional recommendations for investigation, while stated in general terms, also have potential impact on the long term care, perinatal outcomes and the attitudes of women toward prenatal testing.There appears to be a need to determine why women do not consider RUIP as a method of prenatal diagnosis. Qualitative research would provide rich data to assist policy makers or health care practitioners to better understand how to prepare women for prenatal testing. The ambiguity around why RUIP is ordered needs clarification. If the intent of RUIP includes inspection for anomalies, then women and their

partners need to have a clear understanding of this intent. Insight into this issue could also address the need for an informed consent prior to testing.

Further analysis of why women appear to need such profound reassurance about their pregnancy would be helpful. A qualitative study examining the concept of reassurance would provide further insight into this need, whether it is actually obtained from a prenatal sonogram and if it is transient or not. There also appears to be a need to better understand the "worry" pregnant women experience when they experience vaginal bleeding in pregnancy. Research would provide further understanding of this type of "worry" and assist health care practitioners to identify this concern and arrange for appropriate testing.

It would be helpful to understand whether or not a prenatal sonogram is different from any other types of medical imaging. Knowledge of this nature could assist with the review of policies in diagnostic imaging units. There is a knowledge gap when it comes to understanding how sonographers feel about giving out information to patients. This type of investigation could assist with role clarification.

The impact of knowing or not knowing fetal sex prior to delivery deserves further inquiry. The importance of sharing prenatal ultrasound information with someone appears to be an integral experience for pregnant women. A better understanding of this need could possibly reinforce how we communicate with women about prenatal testing. The value of strictly using psychological outcomes to determine standards of practice needs further investigation. There is an apparent need to determine what outcomes best represent safe and efficient health care practice. And finally, the safety of prenatal

sonography must never be forgotten despite the fact to date there are no known adverse effects. Research related to ultrasound safety must be adhered to on a regular basis.

Summary of the Study

Most women in Canada will undergo a sonogram at some point during pregnancy. While the value of diagnostic sonography for prenatal complications has been established, current research suggests there is little consensus within the medical community as to the value of routine ultrasound in pregnancy (RUIP). Nevertheless, despite this uncertainty, utilization rates through the 1990's for prenatal sonography have doubled across Canada (BCOHTA, 1996).

The purpose of this research was to explore the attitudes women have toward prenatal ultrasound and in particular RUIP. A enhanced understanding of women's attitudes toward reproductive technology will help to ensure the development of "women sensitive" health care services. The tenets of feminist research were an ideal fit for conducting an inquiry of this nature; feminist research captures the salient features of a women's lived experience and is done to find answers for women.

A convenience sample of 20 pregnant women, ranging in age from 24 to 38 years, participated in a semi-structured interview during which they expressed their attitudes about prenatal sonography. All had experienced at least one prenatal sonogram and several had had multiple scans. The narratives were summarized to better understand how women prepare, experience and validate this type of reproductive technology. Common threads throughout the narratives were identified and compared with previous studies on

prenatal sonography. Through content analysis, five themes emerged from the data and were used in this comparison. The themes were: a) " In Anticipation;" b) " The Imaging Experience;" c) " The Importance of Knowing;" d) " The Next Time;" and e) "The Ethics of It All."

Some of the study findings were comparable to earlier research that examined a variety of psychosocial variables thought to be influenced by prenatal sonography. There were also new and provocative findings identified in this rich data. The key findings of this investigation suggest women want prenatal sonography because they have been made to feel there is a "need" for this type of testing. Women also want an ultrasound because they think a scan will provide reassurance about fetal health, yet they do not view prenatal sonography to be a method of prenatal diagnosis. Ironically, this attempt to secure prenatal reassurance becomes a "double-edged sword" with the potential to reveal both positive and negative information (Gregg, 1993). In addition, women appear to understand an ultrasound in pregnancy is a "routine" prenatal test. Some participants said if ultrasound was not routine, it should be. There was also an attitude of compliance toward the safety of sonography, almost one of taking safety for granted.

Data analysis suggests there are several variables identified in the literature and this study that may support the aforementioned key findings and contribute further to the medicalization of pregnancy and childbirth. First, the "conceptionalization of need" within the framework of medicalized pregnancy suggests to women there is a need for testing. This contributes to their desire or want of a prenatal ultrasound. Second, the idea of offering women a prenatal scan as a "routine" test has fostered a feeling that if a test is

routine then it must be available, needed and safe. And third, if a "test" is available that can reassure women their pregnancy is progressing normally, then why not offer it to them. This reflects the "therapeutic imperative" and may account for why clients request particular health care investigations and practitioners freely accommodate these requests.

Additional findings of this study demonstrate how women extract reassurance from a prenatal sonogram. There appears to be a relationship between reassurance and the actual "experience" of having a scan. This relationship was dependent on a number of factors and they included: what expectations a woman had before going for a scan, past experience with sonography, reports from others, treatment by all health care practitioners, physical preparation for the test, policies and protocols of the testing centre, provision of feedback (i.e., information) and, for some, the reason for having an ultrasound influenced how women viewed this technology.

The "voiced" attitudes expressed by the women in this study suggests having an ultrasound in pregnancy is now firmly entrenched as routine prenatal care. Critical to this belief, however, for health care policy makers is a lack of evidence supporting RUIP as a benefical test in pregnancy. Can psychosocial reasons stand alone as the evidence to support offering RUIP? While these reasons may be an appealing philosophy, it may be more appropriate to seek out further information by examining why women appear to want testing in pregnancy.

There also appears to be a misunderstanding by clients as to the intent of prenatal sonography. This apparent knowledge gap is concerning, as women (and their partners) need to be informed that one intent of a routine prenatal sonogram includes screening for

fetal malformation. In addition, there is an apparent need to review practice policies and protocols in diagnostic imaging units.

Limitations and recommendations for further research have been made on the basis of the study findings. The information in this study, provided by women who have "lived' the experience of having a prenatal scan, cannot be ignored if policy makers are to develop women sensitive, evidence-based health care practice for women. For the record, is anyone "listening"?

References

Appleton, J.V. (1995). Analysing qualitative interview data: Addressing issues of validity and reliability. Journal of Advanced Nursing, 22, 993-997.

Arney, W. R. (1982). Power and the Profession of Obstetrics. Chicago: The University of Chicago Press.

British Columbia Office of Health Technology Assessment. (1996). Routine ultrasound imaging in pregnancy: How evidence-based are the guidelines? Vancouver: The University of British Columbia.

Bailey, P.H. (1997). Finding your way around qualitative methods in nursing research. Journal of Advanced Nursing, 25, 18-22.

Baillie, C., Mason, G., & Hewison, J. (1997). Scanning for pleasure. British Journal of Obstetrics & Gynecology, 104, 1223-1224.

Bakketeig, L.S., Eik-Nes, S.H., Jacobsen, G., Ulstein, M.K., Brodtkorb, C.J., Balstad, P., et al. (1984). Randomised controlled trial of ultrasonographic screening in pregnancy. Lancet, 2 (8396), 207-211.

Bucher, H.C., & Schmidt, J.G. (1993). Does routine ultrasound scanning improve outcome in pregnancy? Meta-analysis of various outcome measures. British Journal of Medicine, 307 (6895), 13-17.

Burnard, P. (1991). A method of analysing interview transcripts in qualitative research. Nurse Education Today, II, 461-466.

Burst, H.V. (1983). The influence of consumers on the birthing movement. Topics in Clinical Nursing, 5 (3), 42-54.

Canadian Broadcasting Corporation Ideas Transcripts. (Speaker). Birth and technology (Ideas February 15, 1993). Toronto: The Canadian Broadcasting Corporation.

Campbell, J.C., & Bunting, S. (1991). Voices and paradigms: Perspectives on critical and feminist theory in nursing. Advances in Nursing Science, 13 (3), 1-15.

Canadian Task Force on the Periodic Health Examination. (1992). The periodic health examination, 1992 update: 2. Routine prenatal ultrasound screening. Canadian Medical Association Journal, 147 (5), 627-633.

Chervenak, F.A., McCullough, L.B., & Chervenak, J.L. (1989). Prenatal informed consent for sonogram: An indication for obstetric ultrasonography. The American Journal of Obstetrics & Gynecology, 161 (4), 857-860.

Chervenak, F.A., & McCullough, L.B. (1991). Ethics, an emerging subdiscipline of obstetric ultrasound, and its relevance to the routine obstetric scan. Ultrasound in Obstetrics and Gynecology, 1 (1), 18-20.

Cook, R.J. (1991). New reproductive technologies: International legal issues and instruments. Royal Commission on New Reproductive Technologies. Ottawa, Ontario.

Côté-Arsenault, D., & Mahlangu, N. (1999). Impact of perinatal loss on the subsequent pregnancy and self: Women's experiences, JOGNN, 28(3), 274-282.

Cox, D.N., Whittman, B.K., Hess, M., Ross, A.G., Lind, J., & Lindahl, S. (1987). The psychological impact of diagnostic ultrasound. Obstetrics and Gynecology, 70 (5), 673-676.

Cuckle, H. S., & Wald, N. J. (1984). Priciples of screening. In N. J. Wald (Ed.) Antenatal and neonatal screening (pp1-22). Oxford: Oxford University Press.

Dowswell, T., & Hewison, J. (1994). Ultrasound examinations in pregnancy: Some suggestions for debate. Midwifery, 10, 238-243.

Driver, D. (1996, April 9). Sask. reviews necessity of prenatal ultrasounds. The Medical Post, pp. 10.

Eurenius, K., Axelsson, O., & Sjoden, P.O. (1996). Pregnancy, ultrasound screening and smoking attitudes. Gynecology Obstetrics Investigation, 42 (2), 73-76.

Eurenius, K., Axelsson, O., Gallstedt-Fransson, I., & Sjoden, P.O. (1997). Perception of information, expectations and experiences among women and their partners attending a second-trimester routine ultrasound scan. Ultrasound in Obstetrics and Gynecology, 9, 86-90.

Ewigman, B., LeFevre, M., & Hesser, J.A. (1990). A randomized trial of routine prenatal ultrasound. Obstetrics and Gynecology, 76 (2), 189-194.

Ewigman, B., LeFevre, M., Bain, R.P., Crane, J.P., & McNellis, D. (1990). Ethics and routine ultrasonography in pregnancy. The American Journal of Obstetrics & Gynecology, 163 (1), 256-257.

Ewigman, B., Crane, J.P., Frigoletto, F.D., LeFevre, M., Bain, R.P., & McNellis, D. (1993). RADIUS Study Group. Effect of prenatal ultrasound screening on perinatal outcome. New England Journal of Medicine, 329 (12), 821-827.

Fetterman, D. (1989). Ethnography step by step. Newbury Park: Sage.

Field, P.A. (1991). Midwifery in Canada. NWTRNA News, 4-6.

Fletcher, J.C., & Evans, M.I. (1983). Maternal bonding in early fetal ultrasound examinations. The New England Journal of Medicine, 308 (7), 392-393.

Grace, J.T. (1983). Prenatal ultrasound examinations and mother-infant bonding. The New England Journal of Medicine, 309 (9), 561-566.

Grant, A. (1986). Controlled trials of routine ultrasound in pregnancy. Birth, 13 (Suppl.), 16-22.

Gregg, R. (1993). "Choice" as a double-edged sword: Information, guilt and mother-blaming in a high-tech age. Women & Health, 20 (3), 53-73.

Guba, E., & Lincoln, Y. (1989). Fourth Generation Evaluation. Newbury Park: Sage.

Hall, J.M., & Stevens, P.E., (1991). Rigor in feminist research. Advances in Nursing Science, 13 (3), 16-29.

Hanson, E. (1994). Issues concerning the familiarity of researchers with the research setting. Journal of Advanced Nursing, 20, 940-942.

Heidrich, S.M., & Cranley, M.S. (1989). Effect of fetal movement, ultrasound scans and amniocentesis on maternal-fetal attachment. Nursing Research, 38 (2), 81-84.

Huffman, C., & Sandelowski, M. (1997). The nurse-technology relationship: The case of ultrasonography. JOGNN, 26 (6) 673-682.

Hunter, D.J.S. (1991). Indications of obstetrical ultrasound - What are the possibilities and what are the expectations? Journal SOGC, 13 (1), 9-15.

Hyde, B. (1986). An interview study of pregnant women's attitudes to ultrasound scanning. Social Science Medicine, 22 (5), 587-592.

Jorgensen, F.S. (1995). Attitudes to prenatal screening, diagnosis and research among pregnant women who accept or decline an alpha-fetoprotein test. Prenatal Diagnosis, 15, 419-429.

Kemp, V.H., & Page, C.K. (1987). Maternal prenatal attachment in normal and high-risk pregnancies. JOGN Nursing, 16, 179-184.

Kieler, H., Haglund, B., Waldenström, U., & Axelsson, O. (1997). Routine ultrasound screening in pregnancy and the children's subsequent growth, vision and hearing. British Journal of Obstetrics and Gynaecology, 104, 1267-1272.

King, C.R. (1992). The ideological and technological shaping of motherhood. Women & Health, 19 (2/3), 1-12.

Kohn, C.L., Nelson, A., & Weiner, S. (1980). Gravidas' responses to realtime ultrasound fetal image. JOGN Nursing, 9, 77-80.

Lalonde, A.B. (1997). Women's health issues in Canada: Today and tomorrow. Journal of the Society of Obstetricians and Gynaecologists, 19 (3), 287-295.

Larson, E. (1986). Evaluating validity of screening tests. Nursing Research, 35(3), 186-188.

Lenzinger, M., & Rambert, B. (1988). "I can feel it - my baby is healthy:" Women's experiences with prenatal diagnosis in Switzerland. Reproductive and Genetic Engineering, 1, (3), 239-249.

Lerum, C. W., & Lo Biondo-Wood, G. (1989). The relationship of maternal age, quickening and physical symptoms of pregnancy to the development of maternal-fetal attachment. Birth, 16, (1), 13-17.

Lewthwaite, B.J., & Klassen, F. (1997). The cycle of life. An experience with qualitative data analysis. The Canadian Nurse, 93 (8), 24-26.

Lippman, A. (1989). Prenatal Diagnosis: Reproductive choice? Reproductive control? In C. Overall (Ed.), The Future of Human Reproduction (pp. 182-194). Toronto: The Women's Press.

Lippman, A. (1991). Prenatal genetic testing and screening: Constructing needs and reinforcing inequalities. American Journal of Law & Medicine, XVII: 1 & 2, 15-20.

Lo Biondo-Wood, G., & Haber, J. (1994). Nursing Research: Methods, critical appraisal, and utilization (3rd ed.). St. Louis: Mosby.

Lumley, J. (1990). Through a glass darkley: Ultrasound and prenatal bonding. Birth, 17 (4), 214-217.

Madarikan, B.A., Tew, B., & Lari, J. (1990). Maternal response to anomalies detected by antenatal ultrasonography. British Journal of Clinical Practice, 44 (11), 587-589.

Mazzeo, J. A. (1988). Technology, power and the state. In E. H. Baruch, A. F. D'Adamo & J. Seager (Eds.), Embryos, Ethics and Women's Rights (pp. 211-215). London: Harrington Park Press.

Miles, A. (1991). Women, health and medicine. Philadelphia: Open University Press.

Milne, L.S., & Rich, O.J. (1981). Cognitive and affective aspects of the responses of pregnant women to sonography. Maternal Child Nursing Journal, 10 (17), 15-39.

Neilson, J.P., & Grant, A. (1989). Ultrasound in pregnancy. In M. Enkin, M.J.N.C. Keirse & I. Chalmers (Eds.s) A Guide to Effective Care in Pregnancy and Childbirth (pp. 419-439). Oxford: Oxford University Press.

Neilson, J. P. (1993). Routine ultrasound in early pregnancy. In M. Enkin, M.J.N.C. Keirse, M. J. Renfrew et al (Eds.) Pregnancy and Childbirth Module of the Cochrane Database of Systematic Reviews. London: British Medical Journal Publishing Group.

O'Neil, J., & Kaufert, P. (1990). The politics of obstetric care: the Inuit experience. In W.P. Hadwerker (Ed.). Births and Power: Social Change and the Politics of Reproduction. (pp. 53-68). Boulder: Westview Press.

Oakley, A. (1986). The history of ultrasonography in obstetrics. Birth, 13 (Supple.) 5-10.

Oakley, A. (1993). Essays of women, medicine and health. Edinburgh: Edinburgh University Press.

Petchesky, R.P. (1987). Fetal images: The power of visual culture in the politics of reproduction. Feminist Studies, 13 (2), 263-292.

Polit, D.F., & Hungler, B.P. (1995). Nursing research: Principles and methods (5th ed.). Philadelphia: Lippincott.

Postman, N. (1993). Technopoly. New York: Vintage Books.

Quéniart, A. (1992). Risky business: Medical definitions of pregnancy. In D. H. Currie & V. Raoul (Eds.), Anatomy of Gender: Women's Struggle for the Body (pp. 161-174). Ottawa: Carleton University Press.

Reading, A.E., Campbell, S., Cox, D.N., & Stedmere, C.M. (1982). Health beliefs and health care behaviour in pregnancy. Psychological Medicine, 12, 379-383.

Reading, A.E., & Cox, D.N. (1982). The effects of ultrasound examination on maternal anxiety levels. Journal of Behavioral Medicine, 5 (2), 237-247.

Reid, M., & Garcia, J. (1989). Women's views of care during pregnancy and childbirth. In M. Enkin, M.J.N.C. Keirse & I. Chalmers (Eds.), A Guide to Effective Care in Pregnancy and Childbirth (pp. 131-142). Oxford: Oxford University Press.

Relyea, M.J. (1992). The rebirth of midwifery in Canada: An historical perspective. Midwifery, 8, 159-169.

Robinson, K. (1994). Midwifery in South Wales: A contemporary case study. Unpublished master's thesis, University of Manitoba, Winnipeg, Manitoba.

Rothman, B.K. (1988). Reproductive technology and the commodification of life. In E.H. Baruch, A. F. D'Adamos, J. Seager (Eds.) Embryos, Ethics and Women's Rights (pp. 95-100).

Rothman, B.K. (1993). The Tentative Pregnancy. New York: W.W. Norton & Company.

Royal Commission on New Reproductive Technologies. (1993). Proceed with care: Final report of the royal commission on new reproductive technologies. Vol. 1. Ottawa: Minister of Government Services Canada.

Royal Commission on New Reproductive Technologies. (1993). Proceed with care: Final report of the royal commission on new reproductive technologies. Vol. 2. Ottawa: Minister of Government Services Canada.

Ruddick, W. (1988). A short answer to "Who decides?" In E. H. Baruch, A. F. D'Adamo & J. Seager (Eds.). Embryos, Ethics and Women's Rights (pp. 73-76). London: Harrington Park Press.

Saari-Kemppainen, A., Karjalainen, O., Ylostalo, P., & Heinonen, O.P. (1990). Ultrasound screening and perinatal mortality: Controlled trial of systematic one-stage screening in pregnancy: The Helsinki Ultrasound Trial. Lancet, 336 (8712), 387-391.

Salem, S. (1986). Ultrasound in pregnancy: is it safe? Synopsis, 41 (8), 643-647.

Sandelowski, M. (1986). The problem of rigor in qualitative research. Advances in Nursing Science, 8 (3), 22-37.

Sandelowski, M. (1988). A case of conflicting paradigms: Nursing and reproductive technology. Advances in Nursing Science, 10 (3), 35-45.

Sandelowski, M. (1993). Rigor or rigor mortis: The problem of rigor in qualitative research revisited. Advances in Nursing Science, 16 (2), 1-8.

Sandelowski, M. (1994). The use of quotes in qualitative research. Research in Nursing and Health, 17, 479-482.

Sandelowski, M. (1994). Channel of desire: Fetal ultrasonography in two use-contexts. Qualitative Health Research, 4 (3), 262-280.

Sandelowski, M. (1995). Sample size in qualitative research. Research in Nursing & Health, 18, 179-183.

Sandelowski, M. (1995). Qualitative analysis: What it is and how to begin. Research in Nursing & Health, 18, 371-375.

Saskatchewan Health Services Utilization and Research Commission. (1996). Routine prenatal ultrasound guidelines. Saskatoon: Health Services Utilization and Research Commission.

Schei, B. (1992). The routine use of ultrasound in antenatal care: Is there a hidden agenda? Issues in Reproductive and Genetic Engineering, 5 (1), 13-20.

Sigsworth, J. (1995). Feminist research: Its relevance to nursing. Journal of Advanced Nursing, 22, 896-899.

Simkin, P. (1989). Childbearing in social context. Women & Health, 15 (3), 5-20.

Society of Obstetricians and Gynaecologists of Canada. (1999). Guidelines for ultrasound as part of routine prenatal care. Journal of Society of Obstetricians and Gynaecologists, 21(9), 874-879.

Sorrell, J.M., & Redmond, G.M. (1995). Interviews in qualitative nursing research: Differing approaches for ethnographic and phenomenological studies. Journal of Advanced Nursing, 21, 1117-1122.

Sparling, J.W., Seeds, J. W., & Farran, D.C. (1988). The relationship of obstetric ultrasound to parent and infant behavior. Obstetrics and Gynecology, 72 (6), 902-907.

Statham, H., Green, J.M., & Kafetsios, K. (1997). Who worries that something might be wrong with the baby? A prospective study of 1072 pregnant women. Birth, 24 (4), 223-233.

Stewart, N. (1986). Women's views of ultrasonography in obstetrics. Birth, 13 (Supple.), 34-38.

Thorpe, K., Harker, L., Pike, A., & Marlow, N. (1993). Women's views of ultrasonography: A comparison of women's experiences of antenatal ultrasound screening with cerebral ultrasound of their newborn infant. Social Science and Medicine, 36 (3), 311-315.

Tudiver, S. (1993). "Manitoba voices: A qualitative study of women's experiences with technology in pregnancy." In Pregnancy Diagnosis: Background and Input on Individuals. Volume 12 of the Research Studies, Royal Commission on New Reproductive Technologies. Minister of Supply and Services : Ottawa.

Tudiver, S., & Hall, M. A. (1996, August). Women and health service delivery in Canada : A Canadian perspective. Paper presented at the meeting of the Canada-U.S.A. Women's Health Forum, Ottawa, Canada.

U.S. Preventive Services Task Force. (1996). Guide to clinical preventive services: 2nd ed. report of the U.S. Preventive Services Task Force. Baltimore: Williams & Wilkins.

Vanderwater, B. (1992). Meanings and strategies of reproductive control: Current feminist approaches to reproductive technology. Issues in Reproductive and Genetic Engineering, 5 (3), 215-230.

Villeneuve, C., Laroche, C., Lippman, A., & Marrache, M. (1988). Psychological aspects of ultrasound imaging during pregnancy. Canadian Journal of Psychiatry, 33 (6), 530-536.

Waldenström, U. (1996). Modern maternity care: Does safety have to take the meaning out of birth? Midwifery, 2 (4), 165-173.

Waldenström, U., Nilsson, S., Fall, O., Axelsson, O., Eklund, G., Lindeberg, S., & Sjodin, Y. (1988). Effects of routine one-stage ultrasound screening in pregnancy: A randomized controlled trial. Lancet, September, 585-588.

Webb, C. (1984). Feminist methodology in nursing research. Journal of Advanced Nursing, 9, 249-256.

Weir, L. (1998). Pregnancy ultrasound in maternal discourse. In M. Shildrick & J. Price (Eds), Vital Signs - Feminist Reconfigurations of the Biological Body (pp.78-101). Edinburgh: Edinburgh University Press.

Wertz, R. W., & Wertz, D.C. (1990). Notes on the decline of midwives and the rise of medical obstetricians. In P. Conrad & R. Kern (Eds.), The Sociology of Health & Illness: Critical Perspectives (pp. 148-160). New York: St. Martin's Press.

Whitbeck, C. (1988). Fetal imaging and fetal monitoring. Finding the ethical issues. In E. H. Baruch, A. F. D'Adamo & J. Seager (Eds.), Embryos, Ethics and Women's Rights (pp.47-57). London: Harrington Park Press.

Willis, E. (1989). Medical Dominance. Sydney: Allen & Unwin.

Wilson, H.S. (1989). Research in Nursing (2nd ed.). Redmond City: Addison-Wesley.

Zlotogorski, Z., Tadmor, O., Duniec, E., Rabinowitz, R., & Diamant, Y. (1995). Anxiety levels of pregnant women during ultrasound examination: Coping styles, amount of feedback and learned resourcefulness. Ultrasound Obstetrics and Gynecology, 6, 425-429.

Zlotogorski, Z., Tadmor, O., Duniec, E., Rabinowitz, R., & Diamant, Y. (1996). The effect of the amount of feedback on anxiety levels during ultrasound scanning. Journal of Clinical Ultrasound, 24 (1), 21-24.

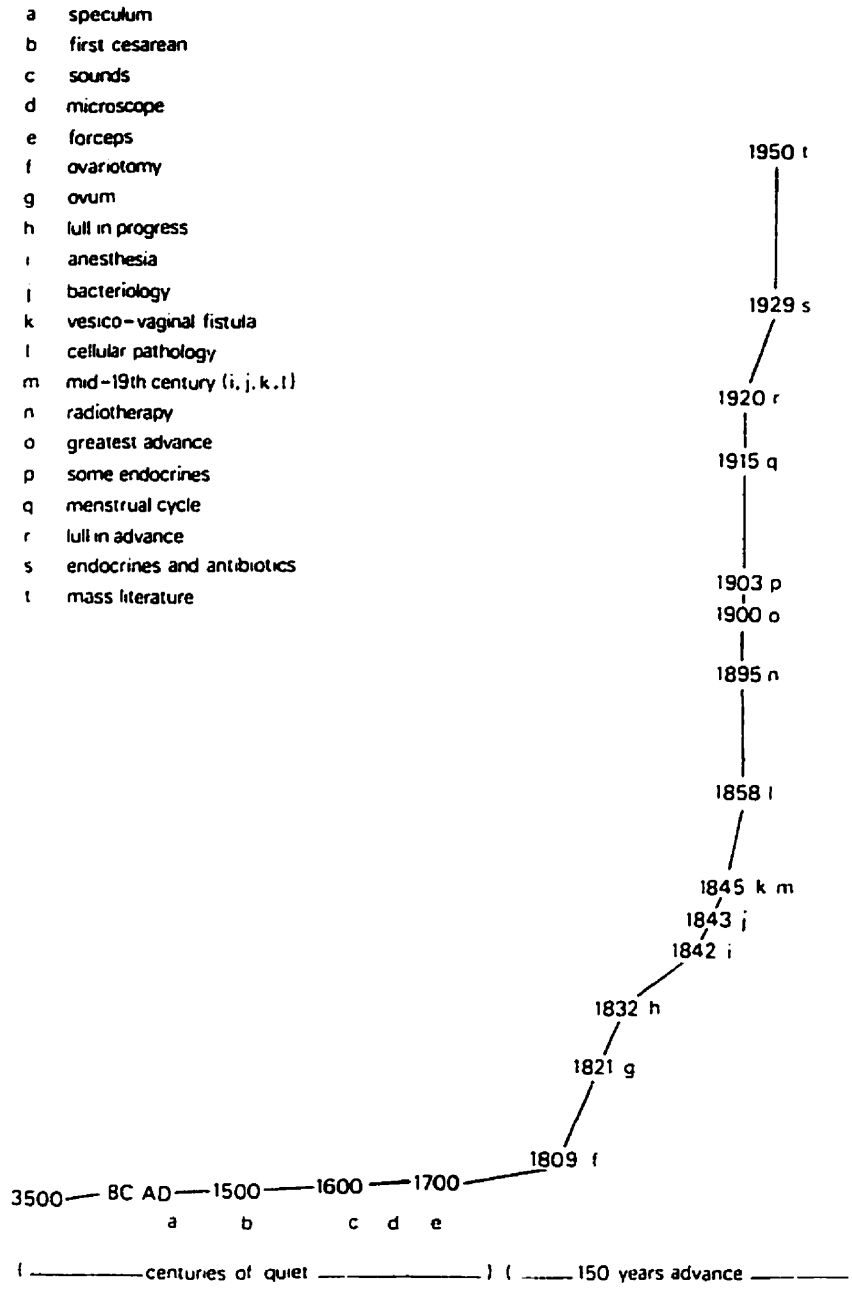
APPENDIX A

Table 1.1 Characteristics of Obstetrical Care in Three Historical Periods

	Preprofessional—to End of Nineteenth Century	Professional Period, 1890–1945	Monitoring Period, Post–World War II
Metaphor and Logic	Birth as mystery *Aristotelian order*	Body as machine *Scientific rationality*	Body as open system of communication Ecological order/systems theory
Conceptualization of Pregnancy	Normal/abnormal	Potentially pathological Dichotomous categories still applicable but boundaries blurred	Pregnancy as process Two-dimensional childbirth: psychological and physiological
Division of Labor	Symbiotic relationship of midwife and obstetrical attendant Midwife attends normal births Barber-surgeons and obstetricians attend abnormal births Terms controlled by midwife	Terms controlled by obstetrical specialist Midwives attend normal birth in Britain Debates over proper division of labor in America	Well-integrated, continuously hierarchical, ubiquitously present obstetrical teams Parents are team members
Attendant/Patient Relationship	Midwife "attends" birth Midwife calls for obstetrical intervention in difficult cases	Obstetrical specialist dominant Specialist presides over birth Patient is vehicle of obstetrical material	Collegial Patient responsible for psychological aspects of birth Obstetrical attendant responsible for physiological aspects of birth
Professional Organization	Localized	Centralized production of knowledge Localized care	Widely dispersed, geographically penetrating, regionalized care centered on medical centers Flexible system of obstetrical alternatives
Who controls birth?	No one Birth is attended and is "uncontrolled"	Obstetricians	The structure of monitoring No agent in control
Technology	Mild relief for normal deliveries Destructive intervention in abnormal deliveries	Technology of domineering control (e.g., forceps, anesthesia, operative intervention)	Technology of monitoring and surveillance

Arney, W.R. (1982). Power and the Profession of Obstetrics. Chicago: The University of Chicago Press.

APPENDIX B



Arney, W.R. (1982). Power and the Profession of Obstetrics. Chicago: The University of Chicago Press.

APPENDIX C

Ultrasound in Obstetrics

5. Those who advocate a new technique are liable to suffer from a strange condition called certainty.

EVALUATION

Ultrasound is not the only obstetric technique which has been subjected rather late in its history to the scrutiny of a controlled trial. In fact, it is the rule rather than the exception that clinical practice absorbs new techniques on the basis of inadequate evidence as to their effectiveness and safety. The 'seven stages in the career of a medical innovation'[101] run as follows: (1) 'promising reports' begin to appear in the literature; (2) the innovation is adopted by professional organizations; (3) the lay public begins to demand the technique; and (4) there ensues the era of routine use or 'standard procedure'. Only next does history expand to include controlled experimental evaluation (5). Finally, we have the last two stages, at which there is professional disbelief in, and denunciation of, the results of scientific evaluation, especially when these challenge the wisdom of routine use (6). This stage merges with one of general discreditation (7), in which a technique hailed earlier in its history as universally applicable comes to be seen as useful only in some cases.

With obstetric ultrasound, I suggest that we are now somewhere between stages (5) and (6). We are beginning to look seriously at routine use of ultrasound, but perhaps not all of us are equally willing to translate the findings of clinical trials into clinical practice.

Oakley, A. (1993). Essays of women, medicine and health. Edinburgh: Edinburgh University Press.

APPENDIX D

RUIP RECOMMENDATIONS EXCLUDED FROM DETAILED APPRAISAL

Reviewing body	Reason for exclusion	Recommendation
National Institute of Health Consensus Development Conference (1984)	Pre-1990	• From the body of information reviewed, taking into account the available bioeffects literature, data on clinical efficacy, and with concern for psychosocial, economic, and legal/ethical issues, it is the consensus of the panel that ultrasound examination in pregnancy should be performed for a specific medical indication. The data on clinical efficacy and safety do not allow a recommendation for routine screening at this time.
Health Council of the Netherlands (1986)	Pre-1990 Review methodology not documented	• The indications for performing any diagnostic ultrasound examination must be reviewed carefully, particularly in regard to its necessity and the possible risks attached. Indications remain ill-defined in the various special fields. Medical specialists' organizations should take the task upon themselves to compile an inventory of the valid indications.
Ringa, Blondel and Breart (1989)	Pre-1990	• With the exception of the detection of malformations, analysis of the literature does not give strong evidence for the efficacy of routine ultrasound scanning in the general population. The authors of the trials assessing it report essentially marginal benefits. The only clear effect proved in the RCTs is the reduction in the rate of induced labours in general, and for post-term pregnancies. These results do not question the use of ultrasound on clinical indication, but they do not support its routine use, although this examination is now widely performed in the general population.
The Society of Obstetricians and Gynaecologists of Canada (1994)	Review methodology not documented	• **Routine Ultrasound:** The Committee recommends that, based on the current obstetrical literature, a second trimester ultrasound scan should be offered to all women. The Society recommends a full screening ultrasound at 16 to 20 week of pregnancy, which is the optimal time for evaluation of dating, biometry and malformation. Earlier or subsequent ultrasound examinations should be offered only when medically indicated.
American College of Cardiology (1988)	Pre-1990	• The application of Doppler in these circumstances is documented as clinically established and non-experimental by a substantial body of referenced literature. Such Doppler application in the second

Continued

Appendix B. RUIP recommendations excluded from detailed appraisal continued

Reviewing body	Reason for exclusion	Recommendation
American College of Cardiology (1988)[123] continued	Pre-1990	and third trimesters of pregnancy has not been documented to have any deleterious effects of the fetus.
American College of Obstetricians and Gynecologists (1993)[67]	Review methodology not documented	• **Routine ultrasonography** in early pregnancy can help to reduce the incidence of labor induction for suspected postdatism and decrease the frequency of undiagnosed major fetal anomalies and undiagnosed twins. However, significant effects on infant outcome are not confirmed by randomised, controlled trials. Although obstetric ultrasound studies are performed routinely in many European countries, in the United States the routine use of ultrasonography cannot be supported from a cost-benefit standpoint.
American Medical Association (1991, 1990)[74-76]	Review methodology not documented	• **Council on Ethical and Judicial Affairs:** Two primary areas of genetic diagnosis are (1) screening or evaluating prospective parents before conception for genetic disease to predict the likelihood of conceiving an affected child; and (2) in utero testing after conception, such as ultrasonography, amniocentesis, and fetoscopy, to determine the condition of the fetus. Physicians engaged in genetic counseling are ethically obligated to provide prospective parents with the basis for an informed decision for childbearing. In providing information to couples who choose to reproduce, physicians should adhere to the Principles of Medical Ethics and Standards of Medical Practice. • **Council on Scientific Affairs:** In summary, real-time US has been partly responsible for the recent significant reductions in perinatal morbidity and mortality and has gained a permanent niche in the practice of obstetrics. However, US examination is not a panacea, as its use is complicated by the occurrence of false negative and positive diagnoses. Because of the current medicolegal climate, it is imperative for clinicians to make liberal use of consultation with specialists whenever abnormalities are detected during routine scanning. US findings must be carefully documented. Furthermore, it is imperative for the clinician to report and manage findings in a timely fashion to avoid the occurrence of adverse perinatal outcome.

Continued

Appendix B. RUIP recommendations excluded from detailed appraisal continued

Reviewing body	Reason for exclusion	Recommendation
Australian Society for Ultrasound in Medicine *et al.* (1993)[152]	Review methodology not documented	• The three organizations...who have direct involvement in obstetric services felt that if pregnant women were to be offered an ultrasound examination for dating, confirmation of dates, exclusion of multiple pregnancies and a careful search for fetal abnormalities, then the optimum timing for this was between an estimated gestational age of 18 and 20 weeks.
International Federation of Gynecology and Obstetrics - Study Group on the Assessment of New Technology (1992)[68]	Review methodology not documented	• **Routine Screening in low-risk pregnancies**: If applicable, an ultrasound examination is recommended at least once in a low-risk pregnancy. The optimum period, balancing pregnancy dating and detection of congenital anomalies, is between 16 and 20 weeks of gestation. • **Indications**: the principal aims of ultrasound scanning to be performed with basic equipment are: in obstetrics, to identify: 1) fetal viability; 2) retained products of conception; 3) number of fetuses; 4) gestational age; 5) fetal abnormality; 6) the biopsy needle for interventional studies; 7) placental location; 8) fetal growth; 9) fetal well-being (biophysical profile). In gynecology, to identify: 1) the normality of genital tract; 2) the location of foreign bodies, IUCDs; 3) pelvic tumors, ovarian, uterine; and to perform 4) ovarian screening for malignancy; 5) endometrial scanning for malignancy; 6) diagnosis of ectopic pregnancy; 7) monitoring of infertility treatment.
Norwegian Consensus Panel (1986)[127]	Pre-1990 Review methodology not documented	• The medical utility of screening has not been documented. Hitherto unrecognized injurious effects cannot be completely ruled out. We can therefore not recommend the inclusion of ultrasound as a mandatory examination for all pregnant women. • The panel is however concerned about the clear over-consumption of ultrasound examinations and the variable quality one sees today. • Under certain conditions...the offer of an ultrasound examination to all pregnant women at around the 17th week of pregnancy could contribute to a reduction in the number of examinations performed, an improvement in their quality, and a more equitable geographic distribution of ultrasound services.

Continued

Appendix B. RUIP recommendations excluded from detailed appraisal continued

Reviewing body	Reason for exclusion	Recommendation
Norwegian Consensus Panel (1986)[127] continued	Pre-1990 Review methodology not documented	• On this background and given the current situation, the panel recommends that there be established an offer of one ultrasound examination at around the 17th week of pregnancy for all pregnant women.
Royal College of Obstetricians and Gynaecologists (Britain) (1984)[71]	Pre-1990 Review methodology not documented	• We believe there are cogent reasons to expect benefit to all mothers and babies from a well performed scan between 16-18 weeks of pregnancy but there is a need for a large well-planned prospective study to determine the extent of the benefits of routine scanning over selective scanning on medical indication.

APPENDIX E

Table 26.15. Number of Obstetrical Ultrasound Procedures*

Year	Number of procedures	Costs ($)
1982-83	358 722	21 174 894
1984-85	490 783	31 871 971
1986-87	636 515	43 748 019
1988-89	813 347	66 618 851
1990-91	998 492	74 649 481

* Number of ultrasound procedures associated with obstetrics and gynaecology and paid for under the provincial medical care insurance plans for Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. Figures for the Atlantic provinces are not included, as ultrasound there is paid for under provincial hospital insurance plans, not medical insurance plans.

Source: Adapted from Health and Welfare Canada data, 1991.

Royal Commission on New Reproductive Technologies. (1993).Proceed with care: Final report of the royal commission on new reproductive technologies. Vol.2. Ottawa: Minister of Government Services Canada.

APPENDIX F

INFORMATION FOR POTENTIAL STUDY PARTICIPANT AT DIAGNOSTIC IMAGING DEPARTMENT

" Hello, my name is Barbara Lewthwaite and I am a graduate student in the Faculty of Nursing at the University of Manitoba. I am conducting a study with women who have undergone an ultrasound examination during their pregnancy. I am interested in talking with you about your views and attitudes toward this type of technology in pregnancy.

May I have your permission to be given your name and telephone number so I may contact you and explain the study in more detail? By releasing these details you are not agreeing to be in the study but to receive more information. I shall contact you by telephone with this information within seven to ten days. You are under no obligation to participate..

Thank you for your time and I hope you will participate in the study".

Name:_____

Telephone Number:_____

Date:_____

APPENDIX G

TELEPHONE CONTACT WITH A POTENTIAL STUDY PARTICIPANT

Hello, my name is Barbara Lewthwaite. As the sonographer at the _____ has explained, I am a graduate student in the Master of Nursing Program at the University of Manitoba. As part of that program, I am required to complete a thesis. For my thesis, I wish to interview women who have had an ultrasound during their pregnancy and ask them their feelings towards this type of technology during pregnancy. Would you like to know more about this study?" If the answer is "no" then the contact is terminated. If the answer is "yes" then the study will be explained in further detail (Appendix I). Prior to giving this information, the potential participant will be asked, for the purpose of communication, if they can read, write and speak English. They will also be asked if they know the results of their ultrasound findings and if their is anything unusual or untoward about these findings and/or their pregnancy . If the response is negative, then the expanded study explanation will be given. If the response is positive, it will be explained why they do not qualify for the study.

" Do you have any questions? Are you willing to participate?" If the individual agrees to participate, a convenient place and time for meeting will be arranged.

The contact will conclude with the appropriate expression of appreciation for their time and effort.

APPENDIX H

EXPLANATION OF THE STUDY

My name is Barbara Lewthwaite. I am a registered nurse with twenty-seven years of nursing experience, the majority of that time has been working with mothers and their new babies. Currently I am a graduate student in the Faculty of Nursing at the University of Manitoba. Graduate studies include the completion of academic course work and a thesis. I have completed my course work and am now undertaking the research to complete my thesis. I am interested in exploring the views and attitudes of women who have undergone an ultrasound during their pregnancy.

To do this research, I plan to interview fifteen to twenty women. If you agree to participate, you will be asked to be interviewed for approximately 1 – 1 ½ hours in your home, or another convenient place, at a time convenient for both of us. These interviews will be tape recorded. During the interview you will be asked some questions about yourself, the experience of having an obstetrical ultrasound during your pregnancy and how you feel about the use of this technology. You may wish to answer some or all of the questions or simply talk about the experience and /or the technology in general. If at any time you wish to discontinue the interview, you may do so. If you decide to participate, but later wish to withdraw from the study, you may do so.

All information shared with me during these interviews will be kept confidential. No names will appear anywhere on the audio tapes or interview transcripts. They will be labeled with a pseudonym name only. The tapes and transcripts will be kept in a locked

drawer and will only be heard or viewed by myself and my thesis advisor. At the completion of this study, the audio tapes will be destroyed but the transcripts will be retained in a safe place for seven years. Any presentations or publications that arise from this study will be conducted in a manner that preserves all participants' anonymity.

While participation in this study may not benefit you directly, it is anticipated by exploring the views and attitudes that women have toward technology in pregnancy and in particular ultrasound, in the future, this technology will be applied more prudently and wisely. But perhaps of even more significance, studies of this nature will assist women, through a process of informed choice, to determine what tests will be conducted during their pregnancies.

If at any time you have questions or concerns about the study, do not hesitate to discuss them with me. I can be reached at _____. A copy of this explanation and the consent form will be provided for your records. If you would like to receive a written summary of the study once it has been completed, please indicate this request and I will be happy to comply.

Thank you.

APPENDIX I

INTERVIEW GUIDE

1. Can we begin the interview by having you tell me some information about yourself: Where were you born? How would you define your ethnic background? What language(s) do you speak? How old are you?

2. What type of education do you have? Highest grade in Grade or High school? Vocational/Diploma/Technical School (type)? University (diploma, degree)?

3. Tell me about your work? Homemaker? Work outside the home, specify? Full time / part time? Currently unemployed? If yes, by choice? Volunteer work?

4. What is your current family / living situation? Single? Married / Common law? Separated / Divorced? Widowed?

5. Would you mind telling me about your past pregnancies: How many times have you been pregnant? Have all your pregnancies been planned? What years were your babies born? Have you had any miscarriages? Are you comfortable telling me if you've had an abortion? Did you experience a problem or unfortunate outcome with any of these pregnancies?

6. Have you had an ultrasound with any of these past pregnancies? With each one? How many? Where were these done? What was the reason(s) for these ultrasounds? Who suggested you have ultrasounds? What were the results of the ultrasounds? Did anything happen during those exams that influenced your feelings about this most recent ultrasound?

7. Now, may we go on to some more questions specifically about ultrasound:
   a) When did you first hear / learn about the use of ultrasound in pregnancy?
   b) Did you have any information before your doctor first suggested going for one?
   c) Who / what were your sources of this information?
   d) Explain what you thought ultrasound could do or what information you might learn from this type of examination.

8. Whose suggestion was it that you have an ultrasound for this pregnancy?
   a) If yours, why did you want one?
   b) If your doctor suggested it, what reason(s) were you given?
   c) Did you understand this reason or why it was important? Explain?
   d) Did you feel you received adequate information before going for the ultrasound?

e) Did you ask any questions before? If so, how did they respond? Did you think of any questions after you left the office
f) Did you ever question the need to have this ultrasound? If so, why and what didyou say / do?
g) How long did you have to wait for this appointment? How did you feel during the period waiting for your appointment?
h) When did you actually have your ultrasound? How many weeks / months pregnant were you when it was done?

9. Now, I would like to talk about your recent experience having an obstetrical ultrasound:
   a) Where was the ultrasound done?
   b) Describe the setting where the exam took place.
   c) How did you have to physically prepare for the exam? Hospital gown? Full bladder? What were your feelings about this preparation?
   d) Did you receive an informed consent before the exam? Sign one? Implied consent? Or simply oral consent? (Investigator will expand on consent definitions).
   e) Who performed your ultrasound? Technician? Doctor? Nurse? Did they introduce themselves and state their professional title and role with regard to the exam?
   f) Was your ultrasound exam done with a vaginal probe? If yes, how did you feel about this? Was your ultrasound done with an abdominal probe? If yes, how did you feel about this? Or was your exam done with both probes? What were your feelings about this? (Investigator will expand on types of probes).
   g) Were you given any information during the examination? If so, who gave you this information? Did you feel there moments of "silence" during the exam? If so, how did you feel during those periods?
   h) Did you feel you were treated with respect during your ultrasound? If not, how did this affect your experience?
   i) Were you allowed to have someone accompany you during the entire examination or only a portion of the exam? If yes, who was with you? Why was it important to have someone with you?
   j) Did you have an opportunity to ask questions during the ultrasound? Were your questions answered to your satisfaction? If yes, why? If no, why?
   k) When did you receive the results of your ultrasound? How did you feel during that waiting period before receiving the results? Who gave you the results? Did you clearly understand what the results meant?

10. Now, I would like to discuss your feelings about seeing your baby on the ultrasound screen:
    a) What did you really see when you first looked at the ultrasound screen?
    b) What did the images you saw look like? " a baby, a head, a heart beating or any other body parts?"

c) What did you want to see the most
d) How did you feel about seeing your baby on the screen?
e) Did having an ultrasound during your pregnancy make you feel different about your baby? If so, how?
f) How do you feel about knowing or not knowing the sex of your baby?

11. Did seeing your baby on the ultrasound screen make you want to change any of your lifestyle habits? For example smoking, alcohol or any other habits? Did you think about this at all? Did you change any behaviours? If so, what and how soon after the ultrasound? Are these changes lasting through the pregnancy? Or were they due to other things happening in your life?

12. Ultrasound tends to be offered routinely: to establish dates, R/O multiple gestation, check fetal development. This information can also be established by other methods, some invasive and some non-invasive, do you think it is necessary for all women to have an ultrasound for these reasons i.e., if no health concerns about the mother or the baby? (Investigator will expand on terminology).

13. Do you think having an ultrasound will effect the outcome of your pregnancy? If so, in what way? Ultrasound can sometimes be used to help diagnose fetal problems, along with other tests. Do you think it should only be used in this way? Why or why not?

14. What concerns have you had regarding this pregnancy? Did/do you ever worry there might be something wrong with your pregnancy and or baby? Are you aware of any familial history that resulted in a baby with a problem or disability? Do you feel it is important to know before giving birth that there might be something wrong with the baby? If there was something wrong, would you consider having more invasive tests such as an amniocentesis or cordocentesis? (Investigator will expand on terminology).

15. What do you know about the safety of ultrasound? Whose responsibility is it to research and test the safety of ultrasound? Did you ever ask questions about safety to your doctor or technician? Why or why not?

16. Did you discuss your ultrasound experience with family, friends or neighbours? In what way were they the same or different?

17. How would you summarize your feelings about having an ultrasound in your pregnancy?
    a) If offered, would you have another ultrasound in this pregnancy or any others?
    b) Would you do anything differently?

c) Do you have any cultural influences/values that might affect how you feel about ultrasound/technology in pregnancy?
d) What would you still like to know, in general, about ultrasound?
e) How might women's experiences with this technology be improved?
f) Is there anything else you can think of to tell me about your experience and or feelings?
g) Do you have any questions for me?

APPENDIX J

Consent To Participate In A Research Study

I, _____, hereby volunteer and consent to participate in the study " _____" as explained and to be carried out by Barbara Lewthwaite, a graduate student in the Faculty of Nursing at the University of Manitoba.

My signature below indicates that:

1. I have read and understand the Explanation of the Study form and this Consent form, and have a copy of these forms in my possession;
2. Prior to giving consent, all my questions and concerns about this study have been addressed;
3. My involvement in this study will be to provide some demographic information and participate in an interview of approximately 1 to 1 ½ hours. I agree to have this interview taped;
4. I am free to withdraw from this study at any time. I have the right to refuse to answer specific interview questions, if I choose. I understand I might be contacted again to review study findings;
5. I will derive no direct benefit from participating in this study;
6. I understand that only the investigator and her thesis advisor will have access to these tapes and study transcripts. The remaining thesis committee will have access only to the coded transcripts;
7. I understand that my confidentiality and anonymity will be safeguarded at the time of this study and any time in the future should this data be used for publication or oral presentation;
8. I am aware this study has been approved by the Ethical Review Committee of the University of Manitoba Faculty of Nursing;
9. I am willing to participate in this study.

I understand that if I have any questions or concerns about this study, I may contact the study investigator, Barbara Lewthwaite, at _____ or Barbara's thesis advisor, Dr. Annette Gupton, at her office, telephone number _____.

Participant Signature:_____ Date:_____

Investigator Signature:_____ Date:_____

I wish to receive a written summary of the findings of this study.

Name_____

Address_____

_____

APPENDIX K

LETTER OF ETHICS APPROVAL

The University of Manitoba

FACULTY OF NURSING
ETHICAL REVIEW COMMITTEE

APPROVAL FORM

Proposal Number N98/36

Proposal Title: "Listening to the Voices: A Qualitative Study to Examine the Attitudes of Women Related to the Routine Use of Ultrasonography in Pregnancy"

Name and Title of
Researcher(s): Barbara Lewthwaite
Graduate Student

Date of Review: June 22, 1998

APPROVED BY THE COMMITTEE:

Comments: With changes dated July 8, 1998

Date: July 9/98

Karen Chalmers

Karen I. Chalmers, PhD, RN — Chairperson
Associate Professor
University of Manitoba Faculty of Nursing

NOTE:
Any significant changes in the proposal should be reported to the Chairperson for the Ethical Review Committee's consideration, in advance of implementation of such changes.

Revised: 92/05/08/se